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Digital Fatigue among Students in Higher Education: Effects on Online Arabic Learning and Coping Strategies

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ENGLISH ABSTRACT
This study explores symptoms of digital fatigue among students and its impact on the effectiveness of online Arabic learning in higher education, while also identifying learners' coping strategies. Using a mixed-methods exploratory design, participants were students of an Arabic Language Education program at a state university in Jambi Province, selected through purposive sampling. Data were collected through semi-structured interviews, online class observations, an adapted Fatigue Assessment Scale (FAS), and LMS documentation. Qualitative data were analyzed using the Miles and Huberman model, while quantitative data were processed descriptively. The findings show that digital fatigue manifested as visual strain when reading Arabic texts, decreased focus during synchronous sessions, and weak vocabulary retention due to limited oral interaction. These symptoms reduced learning effectiveness, reflected in low participation, shallow text engagement, and irregular task submission. Students developed coping strategies such as balancing online–offline study routines, rewriting notes manually, using supportive applications, peer collaboration, and relying on lecturer flexibility. The study concludes that effective online Arabic instruction requires alignment between pedagogical design, cognitive load management, and social connectedness, and recommends integrating microlearning, retrieval practice, and community-based learning to reduce digital fatigue and sustain engagement.

Keywords: Arabic Language Learning, Coping Strategies, Digital Fatigue, Higher Education, Online Classes

INDONESIAN ABSTRACT

Penelitian ini mengkaji gejala kelelahan digital pada mahasiswa dan dampaknya terhadap efektivitas pembelajaran bahasa Arab daring, sekaligus mengidentifikasi strategi penanggulangan yang digunakan. Menggunakan desain mixed-methods exploratory, partisipan adalah mahasiswa Pendidikan Bahasa Arab di sebuah universitas negeri di Jambi yang dipilih melalui purposive sampling. Data diperoleh melalui wawancara semi-terstruktur, observasi kelas daring, kuesioner Fatigue Assessment Scale (FAS) yang telah disesuaikan, serta dokumentasi dari LMS. Analisis kualitatif mengikuti model tematik Miles dan Huberman, sedangkan data kuantitatif dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa kelelahan digital tampak melalui kelelahan visual saat membaca teks Arab, menurunnya fokus selama sesi sinkron, dan lemahnya retensi kosakata akibat interaksi lisan yang terbatas. Dampak ini terlihat pada rendahnya partisipasi, keterlibatan teks yang dangkal, dan ketidakteraturan pengumpulan tugas. Mahasiswa tetap mengembangkan strategi coping seperti menyeimbangkan belajar daring–luring, menulis ulang catatan manual, menggunakan aplikasi pendukung, serta berkolaborasi dengan teman dan memanfaatkan fleksibilitas dosen. Penelitian menegaskan bahwa keberhasilan pembelajaran daring bahasa Arab dipengaruhi oleh keselarasan desain pedagogis, pengelolaan beban kognitif, dan keterhubungan sosial, serta merekomendasikan microlearning, retrieval practice, dan penguatan komunitas belajar untuk mengurangi kelelahan digital.

***Kata Kunci**: Kelelahan Digital, Kelas Daring, Pembelajaran Bahasa Arab, Pendidikan Tinggi, Strategi Penanggulangan*

Introduction

The transformation of higher education in the digital era has brought significant changes to learning patterns, including in the field of Arabic language education. The use of Learning Management Systems (LMS), mobile learning applications, and video conferencing platforms has become the primary instrument for delivering materials, interacting with students, and evaluating learning (Camilleri & Camilleri, 2022; Sanusi et al., 2022). This change opens up significant opportunities for expanding access to learning, but also presents new challenges related to the psychological health of students who must adapt to high levels of screen time.

One emerging psychological phenomenon is digital fatigue, a state of mental, emotional, and cognitive exhaustion resulting from excessive use of digital technology (Rahmi et al., 2025; Supriadi et al., 2025). In the context of online Arabic language learning, digital fatigue has the potential to reduce student concentration, motivation, and participation (Cholili & Hamim, 2024). This situation is an increasingly important issue because learning Arabic demands complex skills, from listening and speaking to reading and writing, all of which require focus and active engagement.

Several educational psychology theories emphasize that learning effectiveness is influenced by the balance between cognitive load, intrinsic motivation, and students' emotional state (Evans et al., 2024). According to cognitive load theory, when cognitive load exceeds working memory capacity, the quality of learning declines (Anmarkrud et al., 2019). Digital fatigue can be viewed as a mental overload, as students are faced not only with Arabic language material but also with digital distractions, multitasking demands, and limited social interaction opportunities. Several previous studies have shown that digital fatigue impacts academic achievement, learning engagement, and student mental health (Khadka, 2025; Nabung, 2024; Tülübaşet al., 2023). Studies in general education have found a correlation between long online learning durations and increased feelings of boredom, stress, and emotional exhaustion (Agyapong et al., 2022; Mheidly et al., 2020; Vogel-Walcutt et al., 2012). However, similar studies specifically examining the impact of digital fatigue on Arabic language learning have not been conducted, both in Indonesia and internationally.

The novelty of this research lies in its direct examination of digital fatigue in the context of online Arabic language learning. Most previous studies have only highlighted the effectiveness of digital media or motivational factors in Arabic language learning, without examining the psychological aspects of students in depth. Thus, this article presents a clear distinction: it discusses not only technology as a learning medium, but also how technology impacts students' mental state and ultimately determines the effectiveness of the Arabic language learning process.

Online Arabic learning in higher education institutions in Jambi uses LMS and video conferencing platforms like Zoom for synchronous sessions, as well as WhatsApp for asynchronous communication. Connectivity issues among students increase their learning burden. Prolonged screen time and limited face-to-face interaction trigger digital fatigue, which affects learning effectiveness.

The urgency of this research is further strengthened by the fact that Arabic has unique characteristics that require intense concentration to understand its writing system, phonology, and syntax. If students experience digital fatigue, the process of acquiring Arabic language skills will be significantly disrupted. The findings of this study are expected to provide essential contributions to Arabic language lecturers in designing more psychologically friendly online learning strategies, thereby minimizing the impact of digital fatigue and maintaining effective learning.

Methods

This study employed a mixed-methods exploratory approach. The qualitative approach explored students' experiences of digital fatigue in online Arabic language classes, while the quantitative approach was used to measure levels of digital fatigue more systematically. Participants were active students enrolled in the Arabic Language Education Study Program at a state university in Jambi Province. The purposive sampling technique was applied to select participants based on specific criteria: students who had completed at least one semester of online Arabic classes and who actively participated in online learning activities. Indicators for digital fatigue and online learning effectiveness were derived from existing literature and then adapted specifically to the context of Arabic language education to ensure relevance and accuracy.

Data collection in this study was conducted through four primary techniques. First, Semi-structured interviews were conducted with 15 students to explore their personal experiences and symptoms of digital fatigue during online Arabic classes. These interviews provided in-depth qualitative insights into physical, mental, and emotional aspects of digital fatigue.

Second, online classroom observations focused on student engagement in the learning process. These observations recorded student behavior during lectures, including consistently activating their cameras, responding to chat features, and engaging in verbal interactions with lecturers and classmates. The data from these observations helped verify the extent to which digital fatigue impacts student active participation.

Third, this study used a digital questionnaire based on the Fatigue Assessment Scale (FAS) adapted to the Arabic language learning context, which was distributed to 100 students. This questionnaire employs a 1–5 Likert scale, enabling researchers to quantify students' levels of digital fatigue. The questionnaire results provide a general overview of the distribution of digital fatigue among Arabic Language Education students.

Fourth, researchers also collected documentary data in the form of student attendance records, archived learning activities in the Learning Management System (LMS), and submitted online assignments. This documentary data was used to supplement student consistency in attending classes and regularity in completing

academic tasks. By combining these four techniques, this study was able to produce comprehensive data from narrative perspectives, actual behavior in online classes, quantitative mapping, and administrative evidence, thus ensuring the validity of the findings.

Next, researchers determined the indicators to focus on in conducting the study, including digital fatigue variables, online class effectiveness, and coping strategies. These variables are summarized in the table below.

Table 1. Research Indicators

Main Variables	Indicators
Digital Fatigue	• Fatigue when reading Arabic text on the screen. • Decreased concentration when listening to lecturers speak in Arabic via Zoom/Google Meet. • Difficulty memorizing vocabulary due to long screen time.
Effectiveness of Online Classes	• Participation in language practice (tadrīb lughawī) • Intense interaction with lecturers and peers during discussions on Arabic texts. • Discipline in submitting translation assignments and essays
Coping Strategies	• Divide your study time between offline and online • Use supporting applications • Support from classmates and lecturers

The data collected in this study were analyzed using an integrated qualitative and quantitative approach. For the qualitative data, the researchers employed thematic analysis, following the Miles and Huberman model, which comprises three main steps: data reduction, data display, and conclusion drawing or verification (Miles et al., 2014). This iterative process was carried out continuously to identify key themes that describe students' experiences of digital fatigue in online Arabic language learning.

Meanwhile, the quantitative data obtained from the Fatigue Assessment Scale (FAS) questionnaire were analyzed descriptively, following guidelines for mixed-methods analysis in educational psychology (Creswell & Plano Clark, 2017). The study involved calculating averages, frequency distributions, and categorizing students' digital fatigue levels (low, medium, high) based on established cut-off scores (Michielsen et al., 2003). The results of this quantitative analysis provide an overview of the extent to which students experience digital fatigue in the context of learning Arabic.

To enhance the trustworthiness and validity of the findings, data triangulation was conducted by comparing the results of interviews, classroom observations, questionnaires, and documentation (Denzin, 2012). This triangulation step

aimed to ensure the consistency of findings and enrich the understanding of the phenomenon under study. Thus, the data analysis in this study not only presents numerical data but also conveys the lived experiences and reflections of students in the Arabic Language Education Study Program at Jambi University as they face the challenges of online learning in the digital era.

Results

This section presents the study's findings on digital fatigue experienced by students in online Arabic language classes and its impact on the effectiveness of learning. The analysis is structured into three main parts: (1) manifestations of digital fatigue, supported by quantitative data, qualitative interviews, and classroom observations; (2) the effectiveness of online Arabic classes, focusing on student participation, interaction, and assignment discipline; and (3) coping strategies developed by students to manage the challenges of digital fatigue.

Digital Fatigue

Fatigue when reading Arabic text on the screen

Findings related to digital fatigue in Arabic language education students are compiled based on quantitative evidence (FAS questionnaire), qualitative data (in-depth interviews), and observations and documentation from online classes. The researchers present summary figures first, followed by an in-depth analysis of each indicator along with illustrative evidence. Questionnaire sample: n = 100 respondents.

Table 2. Quantitative Data on Digital Fatigue

Digital Fatigue Indicator	Percentage of respondents	Number of respondents (calculation)
Fatigue when reading Arabic text on the screen	62%	100 × 0.62 = 62 respondents
Decreased concentration when listening to lecturers via Zoom/Meet	57%	100 × 0.57 = 57 respondents
Difficulty memorizing vocabulary due to long screen time	49%	100 × 0.49 = 49 respondents

In-depth interviews were conducted with 15 purposively selected informants, direct observations were made of several online class sessions, and

LMS documentation (including attendance and assignment submission) was reviewed. One of the most prominent aspects of digital fatigue is eye fatigue when reading Arabic text on screen. Quantitative data showed that 62% of respondents reported quickly feeling tired when reading Arabic text digitally. This finding is supported by qualitative findings, such as Student 11's statement, *"If the Arabic text is long, my eyes quickly get tired and the letters become blurred,"* or Student 07's07's complaint that she found it challenging to deal with many minor harakat marks, requiring her to zoom in repeatedly.

Field observations also revealed a tendency for students to turn off their cameras and only stare at the screen when the main instructions were given. In contrast, others preferred to print materials from PDF format for more comfortable reading. This pattern suggests that visual factors are a significant trigger for fatigue. The complexity of Arabic letters, with their cursive forms, harakat, and punctuation, requires a high level of visual focus. On a screen with low contrast or a small font size, decoding graphemes becomes more tiring than reading on paper. This condition is further exacerbated by prolonged close reading on laptops or devices, which causes eye accommodation strain, blurs vision, and reduces learning stamina. Because Arabic text also requires intensive morphological and syntactic processing, visual distractions further increase cognitive load and accelerate fatigue. The visible impact is a reduced tendency for students to engage in in-depth reading, increased requests for breaks in online classes, and a preference for printing materials, as evidenced by LMS documentation that marks several files as " printed by student."

Decreased concentration when listening to lecturers via Zoom/Meet

Another equally significant phenomenon is the decline in student concentration when listening to lecturers' explanations in online lectures. Questionnaire results showed that 57% of students had difficulty maintaining focus for more than 20–30 minutes. Qualitative evidence supports this. Student 05, who said, "*My concentration usually drops after 20 minutes; the sound becomes background noise, and my mind wanders,"* or Student 08, who admitted to easily getting bored when lecturers speak for long periods without interaction, prompting her to open other media. Field observations also found a typical pattern

of students turning off their cameras, writing short responses in the chat box, and rarely speaking directly. Lecturers had to repeat instructions several times because students weren't understanding them well, an indicator of decreased concentration. This condition can be attributed to the relatively short human attention span, particularly when the material is delivered monotonously and online, without the support of nonverbal cues.

Furthermore, cognitive fatigue resulting from the combination of screen time, multitasking with other applications, and a lack of breaks further depletes students' attentional resources. From a socio-psychological perspective, using cameras off also reduces social pressure to remain actively present, weakening self-regulation. As a result, critical participation in discussions decreased, interactions were limited to short responses via chat, and lecturers were encouraged to insert short activities or breaks to allow students to regain focus.

Another indicator was students' difficulty memorizing vocabulary due to prolonged screen time. A questionnaire survey revealed that 49% of students admitted to losing their vocabulary more quickly after attending online lectures. Student testimonies supported this, such as those expressed by Student 09, who stated, "*When studying vocabulary online, I feel like I forget it quickly. It's more understandable when I'm in person,"* and Student 13, who felt that memorization practice on Zoom wasn'twasn't as intense because they only listened to the lecturer'slecturer's explanations without the repetition practice of a classroom setting.

Observations of language learning suggest that vocabulary practice is predominantly passive, with students writing independently without peer review or pair discussion. Assignment documentation also shows repeated errors, indicating poor memory retention. Analytical, poor memorization is often caused by a lack of interactive retrieval practice, which can help strengthen memory. Online formats usually rely on passive lectures or quizzes, which can reduce memory reinforcement. Other factors include digital distractions and multitasking, which disrupt the process of encoding information into long-term memory.

Furthermore, visual and cognitive fatigue reduce affective engagement, leaving students with less energy to repeat, construct sentences, or create new examples. The apparent consequence is poor medium-term retention, as evidenced

by the results of simple pre- and post-tests in several classes. Some students subsequently turned to self-paced memorization apps, such as Quizlet, although their effectiveness varies depending on consistency of use.

Interview excerpts and observation notes further confirm the reality on the ground. For example, Student 01 stated, *"At home, after an hour on Zoom, my eyes sting. I usually stop and continue later, so the material often gets disjointed,"* while Student 07 preferred reading printed text because it lasted longer than a screen. Field notes revealed that in specific sessions, only a small percentage of students actively responded to the lecturers' questions, with interactions primarily consisting of brief exchanges. In fact, documentation in the LMS displays student comments citing fatigue as the reason for late assignment submissions.

Overall, the validity of these findings is strong, as the questionnaire responses (62%, 57%, and 49%) are consistent with qualitative findings and field observations. This data triangulation reinforces the conclusion that digital fatigue is multidimensional, encompassing visual, cognitive, and memory aspects. The pedagogical impact is clear: decreased student focus and retention hinder the mastery of key skills in Arabic language learning, particularly reading complex texts and memorizing vocabulary. Therefore, intervention strategies are essential, such as providing screen-friendly or printed materials, breaking synchronous lectures into short segments or micro-lectures of up to 20 minutes, and increasing interactive retrieval practice activities in vocabulary exercises. These measures are expected to reduce students' visual, cognitive, and memory load, thereby making online Arabic learning more effective and sustainable.

Effectiveness of Online Classes

Participation in language training

Observations of online classes show that student participation in Arabic grammar has decreased significantly compared to face-to-face courses. In several Arabic conversation sessions via Zoom, only around 35–40% of students actively responded to the lecturer's instructions, either by speaking or providing brief responses. Most students chose to be passive listeners, and on several occasions, the lecturer even had to point directly at students to speak.

LMS documentation data also shows a similar trend. Student activity was more evident in the form of uploaded written exercises rather than audio recordings or video conversations. Some students even submitted only text answers without performing the required oral exercises. This phenomenon suggests that online Arabic grammar instruction tends to shift in format, from two-way communication exercises to more individualized text exercises that involve reproducing text, which reinforces the suspicion that technical factors, such as unstable internet connections, and psychological factors, such as lack of confidence and fear of mispronunciation, hinder students' active involvement in oral language practice.

Participation in the learning-based learning sessions was observed to be declining: observations showed that only about a third of participants consistently activated their microphones and responded to verbal instructions, while the remainder remained passive. This pattern did not emerge by chance; documentation supports the hypothesis that technical and psychological barriers are present. The same observation notes describe situations where lecturers had to point to students' names one by one to elicit a response, indicating a low level of spontaneous readiness to speak. From an analytical perspective, three main mechanisms may explain this pattern. The first is a technical issue: intermittent connections and poor microphone quality reduce students' confidence in speaking, as they fear interruption or being misunderstood. The second mechanism relates to a sense of communicative safety; online platforms heighten feelings of vulnerability when speaking (voices are recorded, potentially exposing mistakes), leading many students to avoid speaking directly.

The third mechanism is cognitive load: fatigue from screen time and the demands of multitasking reduce the mental resources available for spontaneous language, leading students to adopt a passive role to avoid rapid depletion of their mental energy. Consequently, oral exercises that should be repetitive, interactive, and fluency-enhancing become less effective due to the lack of opportunities for authentic and regular speaking practice.

Intensity of interaction with lecturers and friends during Arabic text discussions

The intensity and quality of interactions during Arabic text discussions shifted: observations showed increased activity in chat channels, while real-time verbal interactions were also present, with approximately 30-35% of students verbally active per session, as indicated in observation archives and LMS records. This shift reflects students' adaptation to online environments, as they prefer a medium that allows for controlled thinking time (chat) over the direct demands of verbal communication. However, documentation of forums and LMS chats suggests that these increased responses were generally brief and did not develop into in-depth academic dialogue. Analytically, this phenomenon reflects a trade-off between the quantity and quality of interactions: while the number of recorded interactions remained, the depth of information processing decreased. Without the nonverbal stimulus and intense dialogic interaction, discussions became collections of short responses rather than constructive dialogues that encourage elaboration, argumentation, and clarification of elements crucial to understanding complex Arabic texts. Furthermore, documentation also shows that many discussion threads lacked follow-up from lecturers or peers that could facilitate elaboration, weakening the discussion's potential as a critical learning space.

Discipline in collecting translation and essay assignments

LMS documentation on assignment submissions reveals a variation in discipline: approximately two-thirds of students submit assignments on time, while approximately one-third are late by an average of 2–3 days. Analysis of submission time patterns reveals a concentration of lateness during periods of high synchronous load, indicating that synchronous schedule load correlates with increased lateness in assignment submissions. This data suggests that synchronous load (long sessions, high screen activity) contributes to decreased asynchronous productivity (assignment completion). Functionally, the documentation also reveals that students who consistently submit on time tend to be more active in forums and appear more frequently in observation notes as vocal participants, indicating a correlation between time

management/perseverance and academic engagement. From a pedagogical perspective, this pattern suggests that fatigue and an imbalance in the schedule between synchronous and asynchronous learning can disrupt students' learning rhythms.

Considering the interrelationships between these components, it can be concluded that the technical conditions and structure of long synchronous sessions increase visual and cognitive load, which decreases readiness to speak and increases the tendency for brief communication via chat. This data indicates that cumulative decreases in oral engagement weaken essential retrieval and language production practices, thereby impacting the quality of learning and retention (e.g., vocabulary mastery and fluency). LMS documentation confirms that the practical consequences extend beyond superficial interactions to encompass issues of task management and the quality of academic output.

Student coping strategies

Divide your study time between offline and online

According to the results of semi-structured interviews, most students admitted to experiencing difficulty managing their study rhythm when all activities were shifted to the digital space. To overcome this, they developed strategies for dividing their time between online learning activities and offline independent study. Several students stated that after a synchronous session via Zoom, they usually set aside around 1–2 hours to review the material independently, such as rereading Arabic text from printed modules or rewriting notes by hand to make them easier to recall. Some students also said that they deliberately copied new vocabulary into physical notebooks because they felt the process of writing manually was more helpful for memory than simply reading on a screen. These findings suggest that students tend to transition between online and offline modes as a strategy to maintain concentration and reduce screen fatigue.

Using supporting applications

Students also reported utilizing various digital applications to support their learning process outside of the official LMS. Apps like Google Translate, Al-Qamus Al-Muʿjam al-ʿArabī, and YouTube were used to find alternative

explanations for complex texts. Some students reported using Notion or Microsoft OneNote to organize notes, create vocabulary lists, and even schedule assignments. Others used Grammarly to check the quality of their Arabic essays, although the app is more English-oriented, they found it helpful in terms of sentence structure. Furthermore, communication apps like WhatsApp Groups and Telegram also function as a medium for sharing supplementary materials or online resource searches. This strategy demonstrates that students are not relying solely on the LMS but are actively combining various applications according to their personal needs, as a form of self-regulated learning.

Support from peers and lecturers

Interviews also revealed that coping is not only an individual process, but also a social one. Many students mentioned the critical role of classmates in creating "small learning communities" that serve as a place to share notes, discuss topics, and remind each other about assignment deadlines. Several online study groups formed spontaneously on WhatsApp and Telegram, where students who grasped the material more quickly helped explain it to those struggling. From the lecturer's perspective, support was provided in the form of flexible assignment submission times, personal feedback via voice messages, or simply appreciation for students' small participation. Several students emphasized that the lecturer's communicative attitude and willingness to be contacted outside of class hours were essential factors in reducing stress. These findings suggest that students' coping strategies are closely tied to social support, encompassing both horizontal (peer) and vertical (lecturer) support.

Interview findings revealed that students' coping strategies are multidimensional: (1) Cognitive & Behavioral: dividing online and offline study time and rewriting material to strengthen memory. (2) Technological: utilizing various additional applications as learning scaffolds to aid understanding and learning management. (3) Socio-emotional: relying on the support of classmates and the flexibility of lecturers to maintain motivation and reduce stress. Thus, student coping is not only a response to technical constraints, but also a complex form of adaptation that encompasses academic, technological, and social aspects.

Discussions

This section presents the study's findings on digital fatigue experienced by students in online Arabic language classes and its impact on the effectiveness of learning. The analysis is structured into three main parts: (1) manifestations of digital fatigue, supported by quantitative data, qualitative interviews, and classroom observations; (2) the effectiveness of online Arabic classes, focusing on student participation, interaction, and assignment discipline; and (3) coping strategies developed by students to manage the challenges of digital fatigue.

Digital Fatigue

The phenomenon of digital fatigue experienced by students learning Arabic online demonstrates a complex interaction between visual aspects, attentional capacity, and memory mechanisms. These three domains are interrelated and have a significant impact on learning effectiveness. Quantitative findings showing figures of 62%, 57%, and 49% reinforce the conclusion that this problem is not simply an individual case, but rather a general trend experienced by most participants. From a cognitive load perspective, reading Arabic text on a screen requires more mental effort than reading text with the Latin alphabet. Cognitive Load Theory Sweller (1988) explains that the higher the visual complexity, the greater the processing load required by working memory. The characteristics of Arabic script, which is full of ligatures, harakim, and minor punctuation marks, add to the extraneous load, especially when displayed on devices with low display quality

In line with research by Zayed et al. (2021), screen-based reading activities have been found to increase accommodative stress, resulting in rapid fatigue. Consequently, students tend to avoid lengthy on-screen reading by printing out learning materials or limiting reading time. This situation indicates a misalignment between the design of digital materials and the physiological and cognitive limitations of readers. The second problem relates to the decreased capacity for concentration in synchronous lectures. Attention Span Theory posits that the human focus span tends to be short, specifically 15–20 minutes in a traditional lecture setting (Bradbury, 2016; Lim et al, 2024). In the online context, this duration is further shortened due to the phenomenon of Zoom fatigue, which is caused by the absence of nonverbal cues, one-way communication, and the temptation to multitask. This finding aligns with research by Rahayu & Wirza (2020), which shows that Indonesian students lose

attention more quickly when learning activities take place entirely online without any interaction. In practice, this is evident in students' preference for responding via short chats rather than speaking directly, as well as lecturers' tendency to repeat instructions due to a lack of student focus. Social factors also play a role: turning off cameras reduces the psychological pressure to perform actively, weakening self-regulation and decreasing critical participation.

Another dimension of digital fatigue relates to poor vocabulary retention. According to the concept of Retrieval Practice (Roediger & Butler, 2017). Long-term learning success is strongly influenced by the frequency of active repetition. However, in online practice, students are more often passively listening, taking notes, or taking simple quizzes without deep engagement. As a result, the process of encoding into long-term memory is disrupted, and memorization is quickly lost. Kang (2016) emphasized that active recall is more effective than simply rereading, while in this case, active engagement is rarely facilitated.

Furthermore, digital distractions and visual fatigue worsen students' emotional connection to the material, thus decreasing their motivation to review and practice vocabulary. Some students do use spaced repetition-based memorization apps, such as Quizlet; however, research by Schoeppe et al. (2016)emphasizes that the effectiveness of these apps is highly dependent on user consistency, which often fluctuates in reality. The interconnectedness between these three dimensions-visual, concentration, and memory-demonstrates that digital fatigue is a multidimensional and inseparable phenomenon.

Eye fatigue accelerates attention deficits, while impaired concentration hinders the retention of new information. This negative interaction reduces the effectiveness of Arabic language learning, particularly in reading long texts and mastering vocabulary. The pedagogical implications of these findings suggest the need for learning designs that are more responsive to students' cognitive and physiological limitations. Boumalek et al. (2025) recommend breaking online courses into short micro-lectures with interactive interventions. Therefore, synchronous lectures should not be presented in a lengthy lecture format, but instead should be interspersed with discussions, short quizzes, or group work. Digital learning materials should also be designed to be screen-friendly, with clear font sizes, high contrast, and the option of a printed version to reduce extraneous

load. At the same time, vocabulary learning should incorporate retrieval practice-based strategies, such as peer teaching, flashcards, or low-stakes quizzes, that encourage active repetition. With this approach, barriers arising from digital fatigue can be minimized. Furthermore, these efforts enable online Arabic language learning not only to be effective but also to sustain the quality of students' academic achievement.

Effectiveness of Online Classes

The phenomenon of declining student participation in online language classes demonstrates that technical, psychological, and cognitive dimensions are intertwined in determining the effectiveness of language learning. According to Communicative Language Teaching (CLT) theory, the success of language learning is determined by how often students engage in meaningful interactions (Littlewood, 2002). When the majority of students choose to remain silent, communication, which should be a two-way process, becomes purely receptive. This statement aligns with the findings of Hampel & Stickler (2012), who highlighted that virtual platforms often create psychological distance between learners and instructors, resulting in reduced confidence in speaking.

Furthermore, Krashen (1982) affective filter theory explains that anxiety, fear of making mistakes, and limited network connections can increase affective barriers, ultimately reducing students' courage to express themselves. Consequently, oral practice, which should encourage spontaneity, is reduced to the reproduction of written text. From an interaction perspective, the shift from verbal communication to chat dominance indicates a change in student preferences in adapting to the online context. Vygotsky (1978), within the framework of sociocultural theory, emphasized the importance of scaffolding through dialogue as a means of internalizing knowledge. However, when discussions are fragmented into short responses in chat rooms, the scaffolding process weakens.

This situation is consistent with the findings of Sun & Chen (2016), who showed that online discussions tend to produce shallow interactions without active facilitation from the instructor. With the reduction of non-verbal cues, the loss of the direct question-and-answer dynamic, and minimal follow-up, discussion forums no longer function as arenas for critical thinking but merely as a medium for collecting

answers. The pedagogical implication is a trade-off: the quantity of interaction may be maintained, but the cognitive quality formed through elaboration and clarification declines drastically. The link between disciplined assignment submission and active participation adds a new dimension to the analysis of online classroom effectiveness. Self-regulated learning theory posits that practical time management skills, motivation, and independent learning strategies are essential for academic success. Students who consistently submit assignments on time also appear to contribute verbally more frequently in class, demonstrating a correlation between self-regulation and educational engagement (Zimmerman, 2002).

Conversely, prolonged synchronous workloads can weaken asynchronous productivity, a phenomenon paralleled by Conrad et al.'s (2022) report, which suggests that screen fatigue hinders completion of assignments in online learning. In other words, an unbalanced class structure between synchronous and asynchronous sessions directly impacts the quality of students' academic output. All three dimensions of these findings, low participation in tadrīb lughawī, the shift to shallow chat interactions, and irregular assignment submissions, are rooted in the same factors: high cognitive load and a low sense of presence in the virtual classroom.

When cognitive capacity is limited, students prefer passive, low-risk learning strategies. Therefore, the issue of the effectiveness of online Arabic language learning is not simply a matter of infrastructure, but also of instructional design that is not fully responsive to students' limited attention and motivation. Several recent studies support this interpretation. Bao (2020) emphasized that effective online learning requires a flexible design that integrates short synchronous sessions with asynchronous activities that encourage collaboration. This finding is reinforced by Guo et al. (2014), who recommend short micro-lectures with interactive interludes to maintain attention. In the context of language learning, Wu & Marek (2018) demonstrated that the use of mobile-assisted language learning can increase oral participation if designed with repetitive, retrieval-oriented practice tasks.

By summarizing previous findings, theories, and research, it can be emphasized that the synergy between technical, affective, and cognitive factors greatly influences the effectiveness of online classes in Arabic language learning. Online classes are not simply a translation of face-to-face learning to a digital screen, but rather a new ecosystem that demands different pedagogical engineering.

Without appropriate intervention, online learning often yields passive students, superficial discussions, and inconsistent academic management. Therefore, learning design must be directed at strategies that can reduce cognitive load, increase affective safety, and strengthen student self-regulation to maintain the effectiveness of online classes.

Student Coping Strategies

Students' coping strategies for online learning demonstrate a complexity involving cognitive, behavioral, technological, and social aspects. Efforts to divide time between online and offline activities reflect self-regulated learning, where learners attempt to control their learning environment, time, and methods to achieve academic goals. Students who transcribe material into printed materials are actually applying Paivio (1986) dual coding theory, which explains that storing information through verbal and visual channels strengthens memory retention. Manual writing activities also enhance generative processing because engaging both motoric and cognitive skills helps deepen understanding compared to simply reading from a screen (Fiorella & Mayer, 2015). This statement is consistent with research by Mueller & Oppenheimer (2014), which found that hand-taking produces better conceptual understanding than typing. Therefore, switching to offline mode after a synchronous session is not simply a substitute for online activities but a cognitive strategy to reduce screen fatigue and maintain focus. The use of additional applications outside the LMS demonstrates a personalized learning pattern in which students construct their own digital ecosystem according to their needs. Learning in the digital age occurs not only through human interactions but also through information networks, applications, and online resources. By using dictionary apps, YouTube, Notion, or Grammarly, students build learning scaffolds that expand the formal learning environment (Downes, 2012).

Research by Lai & Gu (2011) shows that out-of-class digital practices play a significant role in enhancing foreign language skills, as they enable students to learn independently at their own pace. In this context, applications are not merely technical aids, but function as cognitive offloading, namely, a way to reduce the burden on internal memory by shifting some processing to external media (Risko & Gilbert, 2016). This pattern illustrates increasing independence in managing the

learning process. The social dimension also appears dominant in students' adaptive strategies. Peer support through online study groups reflects the principle of social constructivism, which emphasizes the importance of collaboration within the zone of proximal development (ZPD) (Bandura, 1986). When students share notes and explain material, a peer scaffolding process occurs that accelerates understanding. This statement aligns with research by Topping (2005), which showed that peer learning increases motivation and knowledge through collaborative interactions.

From the lecturer's perspective, flexibility in providing deadlines and personalized feedback enhances teacher immediacy (Andersen, 1979), which refers to the close communication between instructor and student that positively impacts emotional engagement and learning satisfaction. A study by Tice et al. (2021) confirmed that instructor presence in online classes is closely related to reduced student stress levels and an increased sense of belonging to the class. Therefore, the lecturer's role as an adaptive facilitator is key to successful coping.

Overall, students' coping strategies can be understood through the framework of Lazarus & Folkman'sFolkman's (1984) transactional model of stress and coping. Students perceive online learning as a source of stress and then develop various adaptive mechanisms, both problem-focused (such as time management and using applications) and emotion-focused (such as social support from friends and lecturers). This multidimensional adaptation demonstrates that coping is not merely a temporary response, but rather a form of adaptive expertise Hatano & Inagaki, 1986) that allows students to adjust strategies according to the context. In other words, the success of online learning is determined not only by digital infrastructure but also by students' capacity to self-regulate, optimize technology, and utilize social support.

This study proposes several practical implications for Arabic language lecturers to enhance the effectiveness of online learning while reducing digital fatigue. Lecturers should design screen-friendly learning materials with clear fonts and provide printable options to minimize eye strain. Synchronous sessions should be divided into short micro-lectures interspersed with interactive activities to maintain students' attention and engagement. Vocabulary learning should emphasize active retrieval practices, such as peer teaching and quizzes, to improve retention. Moreover, creating a supportive online environment that encourages verbal

participation can help overcome affective barriers like anxiety. Balancing synchronous and asynchronous activities is essential to prevent cognitive overload and improve task completion. Lecturers are also advised to guide students in self-regulated learning strategies and the use of supplementary digital tools, while facilitating peer support networks and maintaining flexible, accessible communication. By applying these strategies, Arabic language lecturers can create a more sustainable and psychologically supportive online learning experience that boosts student motivation, participation, and language mastery.

Conclusion

Based on the research results, it can be concluded that online Arabic language learning faces significant challenges, including digital fatigue, low effectiveness of oral exercises and text discussions, and discrepancies in discipline in task management. However, students demonstrate adaptability through cognitive, technological, and social coping strategies. The phenomenon of digital fatigue is multidimensional, encompassing visual overload, decreased concentration, and poor vocabulary retention, which directly hinder pedagogical outcomes. The effectiveness of online classes is also reduced by low participation in language exercises and shallow academic discussions, although some students maintain discipline. On the other hand, coping strategies demonstrate students' resilience in managing online and offline time, utilizing additional applications, and building learning communities with the help of learning system educators. The limitations of this study lie in the small sample size within the local context and the predominance of potentially biased self-report data. Therefore, further research is recommended to expand the scope by involving populations across universities, employing a longitudinal design to examine long-term dynamics, and exploring effective pedagogical interventions, such as micro-learning, screen-friendly material design, and the integration of interactive retrieval practice, to reduce digital fatigue and improve the quality of online Arabic language learning.

References

Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, burnout, anxiety, and depression among teachers: A scoping review. *International Journal of Environmental Research and Public Health*, *19*(17), 10706. https://doi.org/10.3390/ijerph191710706

Andersen, J. F. (1979). Teacher Immediacy as a Predictor of Teaching Effectiveness. *Annals of the International Communication Association*, *3*(1), 543–559. https://doi.org/10.1080/23808985.1979.11923782

Anmarkrud, Ø., Andresen, A., & Bråten, I. (2019). Cognitive load and working memory in multimedia learning: Conceptual and measurement issues. *Educational Psychologist*, *54*(2), 61–83. https://doi.org/10.1080/00461520.2018.1554484

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies*, *2*(2), 113–115. https://doi.org/10.1002/hbe2.191

Boumalek, K., Bakki, A., El Mezouary, A., Hmedna, B., & Eddahibi, M. (2025). Micro-learning design and micro-course structuring: a systematic literature review. *Interactive Learning Environments*, 1–27. https://doi.org/10.1080/10494820.2025.2545955

Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more? *Advances in Physiology Education*, *40*(4), 509–513. https://doi.org/10.1152/advan.00109.2016

Camilleri, M. A., & Camilleri, A. C. (2022). The acceptance of learning management systems and video conferencing technologies: Lessons learned from COVID-19. *Technology, Knowledge and Learning*, *27*(4), 1311–1333. https://doi.org/10.1007/s10758-021-09561-y

Cholili, A. H., & Hamim, H. (2024). Attentional distraction in app-based language learning with mobile phones: a literature review. *J-Simbol: Jurnal Magister Pendidikan Bahasa Dan Sastra Indonesia*, *12*(2), 478–493. https://doi.org/10.23960/J-Simbol

Conrad, C., Deng, Q., Caron, I., Shkurska, O., Skerrett, P., & Sundararajan, B. (2022). How student perceptions about online learning difficulty influenced their satisfaction during Canada's Covid-19 response. *British Journal of Educational Technology*, *53*(3), 534–557. https://doi.org/10.1111/bjet.13206

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research (3rd ed.)*. Thousand Oaks, CA: SAGE Publications.

Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, *6*(2), 80–88. https://doi.org/10.1177/1558689812437186

Downes, S. (2012). *Connectivism and connective knowledge: Essays on meaning and learning networks.* Ottawa: National Research Council Canada.

Evans, P., Vansteenkiste, M., Parker, P., Kingsford-Smith, A., & Zhou, S. (2024). Cognitive load theory and its relationships with motivation: A self-determination theory perspective. *Educational Psychology Review*, *36*(1), 1–25.

https://doi.org/10.1007/s10648-023-09841-2

Fiorella, L., & Mayer, R. E. (2015). *Learning as a generative activity: Eight learning strategies that promote understanding*. Cambridge, England: Cambridge University Press.

Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. *Proceedings of the First ACM Conference on Learning at Scale*, 41–50. https://doi.org/10.1145/2556325.2566239

Hampel, R., & Stickler, U. (2012). The use of videoconferencing to support multimodal interaction in an online language classroom. *ReCALL*, *24*(2), 116–137. https://doi.org/10.1017/S095834401200002X

Hatano, G., & Inagaki, K. (1986). *Two courses of expertise. In H. Stevenson, H. Azuma, & K. Hakuta (Eds.), Child development and education in Japan*. New York: W. H. Freeman.

Kang, S. H. K. (2016). Spaced repetition promotes efficient and effective learning: Policy implications for instruction. *Policy Insights from the Behavioral and Brain Sciences*, *3*(1), 12–19. https://doi.org/10.1177/2372732215624708

Khadka, C. (2025). Internet Addiction and Its Impact on Student Mental Health. *Dristikon: A Multidisciplinary Journal*, *15*(1), 41–58. https://doi.org/10.3126/dristikon.v15i1.77120

Krashen, S. D. (1982). *Principles and Practice in Second Language Acquisition.* Oxford: Pergamon Press.

Lai, C., & Gu, M. (2011). Self-regulated out-of-class language learning with technology. *Computer Assisted Language Learning*, *24*(4), 317–335. https://doi.org/10.1080/09588221.2011.568417

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing Company.

Lim, E. L., Murugesan, R. K., & Balakrishnan, S. (2024). Leveraging machine learning techniques for students' attention detection: A review. *IAES Int. J. Artif. Intell.(IJ-AI)*, *13*(2), 1195–1205.

Littlewood, W. (2002). The task-based approach: Some questions and suggestions. *ELT Journal*, *58*(4), 319–326. https://doi.org/10.1093/elt/58.4.319

Mheidly, N., Fares, M. Y., & Fares, J. (2020). Coping with stress and burnout associated with telecommunication and online learning. *Frontiers in Public Health, 8*, 1–7. https://doi.org/10.3389/fpubh.2020.574969

Michielsen, H. J., De Vries, J., & Van Heck, G. L. (2003). Psychometric qualities of a brief self-rated fatigue measure: The Fatigue Assessment Scale. *Journal of Psychosomatic Research, 54*(4), 345–352. https://doi.org/10.1016/S0022-3999(03)00392-6

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook (3rd ed.).* Thousand Oaks, CA: SAGE Publications.

Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of longhand over laptop note-taking. *Psychological Science*, *25*(6), 1159–1168. https://doi.org/10.1177/0956797614524581

Nabung, A. (2024). The impact of multitasking with digital devices on classroom

learning: A critical review on the future of digital distraction in education. *US-China Education Review*, *14*(6), 369–383. https://doi.org/110.17265/2161-623X/2024.06.005

Paivio, A. (1986). *Mental representations: A dual coding approach*. England: Oxford University Press.

Rahayu, R. P., & Wirza, Y. (2020). Teachers' perception of online learning during the COVID-19 pandemic. *Jurnal Penelitian Pendidikan*, *20*(3), 392–406. https://doi.org/10.17509/jpp.v20i3.29226

Rahmi, K. H., Fahrudin, A., Supriyadi, T., Herlina, E., Rosilawati, R., & Ningrum, S. R. (2025). Technostress and cognitive fatigue: Reducing digital strain for improved employee well-being: A literature review. *Multidisciplinary Reviews*, *18*(2), 1–11. https://doi.org/10.31893/multirev.2025380

Risko, E. F., & Gilbert, S. J. (2016). Cognitive offloading. *Trends in Cognitive Sciences*, *20*(9), 676–688. https://doi.org/10.1016/j.tics.2016.07.002

Roediger, H. L., & Butler, A. C. (2017). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences*, *15*(1), 20–27. https://doi.org/10.1016/j.tics.2010.09.003

Sanusi, A., Maulana, D., & Sabarno, R. (2022). Synchronous and asynchronous: Teaching and learning Arabic in building student well-being during the Covid-19 pandemic. *ALSUNIYAT: Jurnal Penelitian Bahasa, Sastra, Dan Budaya Arab*, *5*(1), 13–29. https://doi.org/10.17509/alsuniyat.v5i1.44537

Schoeppe, S., Alley, S., Van Lippevelde, W., Bray, N. A., Williams, S. L., Duncan, M. J., & Vandelanotte, C. (2016). Efficacy of interventions that use apps to improve diet, physical activity, and sedentary behaviour: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1), 1–26. https://doi.org/10.1186/s12966-016-0454-y

Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, *15*, 157–190. https://doi.org/10.28945/3502

Supriyadi, T., Sulistiasih, S., Rahmi, K. H., Pramono, B., & Fahrudin, A. (2025). The Impact Of Digital Fatigue On Employee Productivity And Well-Being: A Scoping Literature Review. *Environment And Social Psychology*, *10*(2), 1–13. https://doi.org/110.59429/esp.v10i2.3420

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, *12*(2), 257–285. https://doi.org/10.1016/0364-0213(88)90023-7

Tice, D., Baumeister, R., Crawford, J., Allen, K. A., & Percy, A. (2021). Student belongingness in higher education: Lessons for Professors from the COVID-19 pandemic. *Journal of University Teaching and Learning Practice*, *18*(4), 1–14.

Topping, K. J. (2005). Trends in peer learning. *Educational Psychology*, *25*(6), 231–645. https://doi.org/10.1080/01443410500345172

Tülübaş, T., Karakose, T., & Papadakis, S. (2023). A holistic investigation of the relationship between digital addiction and academic achievement among students. *European Journal of Investigation in Health, Psychology and Education*, *13*(10), 2006–2034. https://doi.org/10.3390/ejihpe13100143

Vogel-Walcutt, J. J., Fiorella, L., Carper, T., & Schatz, S. (2012). The definition, assessment, and mitigation of state boredom within educational settings: A comprehensive review. *Educational Psychology Review*, *24*(1), 89–11. https://doi.org/10.1007/s10648-011-9182-7

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wu, W. C. V., & Marek, M. (2018). Developing interactive and reflective learning through mobile-assisted language learning. *International Journal of Computer-Assisted Language Learning and Teaching*, *8*(1), 51–69. https://doi.org/10.4018/IJCALLT.2018010104

Zayed, H. A. M., Saied, S. M., Younis, E. A., & Atlam, S. A. (2021). Digital eye strain: prevalence and associated factors among information technology professionals, Egypt. *Environmental Science and Pollution Research International, 28*(20), 25187–25195. https://doi.org/10.1007/s11356-021-12454-3

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2