

Smartphone Distraction in Reading Activities: An Analysis of 10 Types and 12 Contributing Factors among EFL Students

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Abstract: This research aims to identify and analyze the types and factors of smartphone distractions among university students during reading activities. It focuses on how these distractions affect EFL students' reading activities. This research uses a mixed-method approach, specifically using an explanatory sequential design. Data were collected using a 66-item questionnaire distributed to first-year English Study Program students to measure the frequency of smartphone distraction types and levels of agreement on contributing factors. The questionnaire findings were elaborated by conducting semi-structured interviews with several students to strengthen them. A correlation was also conducted using Spearman's rho. These methods help to provide a clear explanation of student behaviors. The results successfully identified 10 types of smartphone distractions and 12 contributing factors that occur during reading activities. The data show that smartphone sounds are the most common distraction, and Emotion regulation is the dominant factor among students. The Spearman's Rho test showed that smartphone distraction is related to most internal factors (especially Attention Impulsiveness and FoMO) as well as external factors (especially Ease of internet access and Design of smartphone). Emotional regulation and learning motivation did not show a significant correlation. Furthermore, these findings indicate that using smartphones for learning requires good self-control to reduce focus loss and improve reading comprehension. This research makes a useful contribution by developing an instrument to assess smartphone distractions in digital learning. It underscores the need for educators to develop strategies to help students control their reading or study habits. This is important so that students can use smartphones as an effective academic tool rather than a source of cognitive disruption. Lecturers can divide digital texts into smaller sections to reduce cognitive load and allocate a specific "notification-free" period at the start of the session. These strategies will help students achieve better academic outcomes.

Keywords: smartphone distractions, reading, EFL students, digital media, academic performance.

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■ INTRODUCTION

Reading plays a crucial role in English language learning. As a fundamental skill, reading serves as a basic tool for learning and acquiring knowledge (Lalièræ & Dubravac, 2021). Reading activities involve high-level cognitive processes, such as analyzing, synthesizing, and evaluating information (Hattan et al., 2024; Butterfuss et al., 2020). This is consistent with research showing that reading activities, particularly through creative reading strategies, can improve students' critical

thinking skills and reading comprehension (Shahini et al., 2025). Therefore, reading skills are a key factor in the success of English language learning.

In this era of digital advancements, smartphones have become a primary reading tool. This is because smartphones are more accessible and practical for students (Rabah, 2024). In addition, Burudi et al. (2024) found that smartphone use significantly enhances English language learning, particularly in pronunciation, word forms, and spelling, by providing internet

access and a range of supportive learning applications. This is also aligned with Chakravarthy & V. (2023), who highlight that smartphones improve reading skills more effectively than conventional academic settings by providing language learners with a stress-free environment. Thus, smartphones provide significant benefits for reading activities through features that facilitate practical, comprehensive access to digital data sources.

However, despite these benefits, smartphone use also presents various challenges, including smartphone distraction. Distraction is defined as a condition in which an individual's attention is diverted from the primary task by digital devices such as smartphones, laptops, or tablets (Mayildurai et al., 2019; Flanigan & Kim, 2022). In the modern era, with technology playing a major role, the challenges of digital distraction have become increasingly pressing (Park et al., 2025). In this research, distraction is caused by other applications, notifications, or features within learning applications that divert focus from the main learning activity: reading (Flanigan & Kim, 2022; Pérez-Juárez et al., 2023; Kaur, 2025). Reading in a foreign-language context is a complex process involving both low-level abilities, such as decoding, and high-level abilities, such as constructing meaning from a text (Grabe, 2009; Habók et al., 2019). This means that reading in a foreign language demands a multifaceted focus, so smartphone distractions will directly reduce students' efficiency in balancing the technical processes of decoding and understanding the text's meaning. This aligns with Metruk (2022), who reported that distraction is one of the challenges students face when developing their language skills using smartphones. Similarly, Asti et al. (2024) also found that distractions from social media notifications, instant messages, and entertainment applications can reduce learning effectiveness. These distractions occur for several reasons:

Wang et al. (2022) found that digital distraction stems from psychological factors such as anxiety, depression, and FoMO, and is influenced by academic motivation and misconceptions about the effectiveness of multitasking in learning. Thus, several factors influence smartphone distraction in reading.

This phenomenon can be explained through the Cognitive Load Theory proposed by Sweller (1988), which posits that human working memory has a strictly limited capacity for processing new information. In this research, smartphone distractions act as extraneous cognitive load that depletes students' limited mental resources, thereby impeding their ability to acquire and retain English language skills. Additionally, smartphone distraction can also be understood through attention theory, where Kahneman (1973) explains that the human mind has a limited capacity, which prevents individuals from focusing optimally on multiple activities simultaneously. However, modern digital media environments create different types of distractions than those of the 1980s. Today, smartphones use interactive user interfaces and instant notifications that constantly pull students' attention away. Combining Cognitive Load Theory with modern digital frameworks, C. Wang (2022) demonstrates that digital distractions such as unexpected interruptions and continuous notifications disrupt cognitive processing. When reading English texts, these constant stimuli split students' attention and overload working memory. This increases extraneous cognitive load, directly reducing the cognitive resources needed for comprehension. Consequently, maintaining focus is not merely a behavioral effort to resist distractions but a vital cognitive mechanism for minimizing interface-induced cognitive load.

This condition is also reflected in the results of the researcher's preliminary survey of approximately 200 English Study Program students, which revealed that they primarily used

smartphones for reading. They reported that during in-class reading activities, they used smartphones to read texts or search for additional information. For example, they read a text and then were asked to find the main idea or vocabulary in an online journal article, either individually or in groups, using their smartphones. They also used smartphones in reading class to take quizzes or complete assignments based on the reading. Consequently, first-year students in the English study program at Universitas Riau may be distracted by their smartphones when reading new texts in class. Therefore, one objective of the research is to explore the types of smartphone distractions they experience and the factors that contribute them during students' reading process.

Previous research has explored digital distractions in educational environments from various perspectives. Several studies have focused on educators' and students' perceptions. For instance, Güngör (2024) employed a qualitative phenomenological approach to explore how secondary school teachers perceive digital distractions, while Pérez-Juárez et al. (2023) used a survey to capture the perspectives of engineering students in higher education on general classroom distractions. Other researchers have focused on specific consequences and mitigation strategies; for example, Kuznekoff et al. (2015) employed an experimental design with group assignments to demonstrate how cell phone multitasking hinders classroom comprehension. Similarly, Kostia & Randelovia (2022) conducted a literature review of 15 scientific articles to evaluate the cognitive reduction caused by multitasking environments, while C. H. Wang et al. (2022) used a quantitative approach to propose Self-Regulated Learning (SRL) as a countermeasure against anxiety-driven smartphone usage. Furthermore, experimental and mixed-methods designs have

been applied to assess behavioral shifts and interventions, as seen in the quasi-experimental study by Park et al. (2025), which evaluated the effectiveness of visual prompts and classroom norms in secondary classrooms, and the mixed-methods case study by Rabah (2024), which examined the shifts in reading habits among first-year university students.

Despite these comprehensive insights, significant gaps remain in the existing literature. Most previous major research studies have focused on general classroom settings, teacher perspectives, or secondary school contexts. Meanwhile, research addressing higher education often limits its scope to specific non-linguistic areas such as engineering or broad media shifts. Very few studies provide an in-depth, focused mapping of smartphone-related distractions during cognitively more demanding reading activities than in traditional classroom learning, particularly among EFL (English as a Foreign Language) students. This research demonstrates its novelty. Unlike previous research that largely examined mitigation strategies or generalized academic impairments, this research specifically isolates reading courses in higher education to diagnose the exact nature of these distractions. As an environment where students are trained to master intensive academic reading in the digital age, leaving these digital distractions unaddressed can seriously impair their critical comprehension skills. Without a clear diagnosis of these specific distraction patterns and the reasons for smartphone distraction, effective instructional development interventions will be difficult to implement, potentially lowering overall student achievement in the English study program in reading and learning. This research also fills a gap in the literature through Spearman's Rho correlation analysis, which maps the one-to-one relationship between specific (internal and external) factors and the types of smartphone distractions students experience. Therefore, this

research investigates the specific types of distractions students experience due to smartphone use (RQ1), analyzes the factors contributing to these distractions during reading activities (RQ2), and examines the correlation between the types and the contributing factors (RQ3).

METHOD

Research Design

This research used an explanatory sequential mixed-methods design (Creswell & Creswell, 2018). Quantitative data were first collected through questionnaires to identify types of smartphone distraction and contributing factors, followed by qualitative interviews to explain these findings. Additionally, Spearman’s rho was used to examine the relationship between these factors and the types of smartphone distractions. This approach was chosen to provide a deeper understanding of the phenomenon. The research was conducted from September 2025 to April

2026 at the English Study Program, Faculty of Teacher Training and Education, Universitas Riau, in Simpang Baru, Tampan, Pekanbaru City, Riau Province.

Participants

The population consisted of 120 first-year EFL students (aged 18-19) who experience higher cognitive load when processing unfamiliar texts. Eighty-two participants were selected from the population using simple random sampling to ensure equal selection probability (Noor & Golzar, 2022). This was done objectively using a Microsoft Excel random number generator to assign a unique number to each student. The students’ daily smartphone usage for general reading and academic purposes is 1 to 2 hours. However, this research focused exclusively on the 100-minute weekly in-class reading sessions (including discussions, quizzes, and exercises). Out-of-class smartphone use was excluded to ensure contextual accuracy.

Table 1. Participants

Variable	Category	Frequency (f)	Percentage (%)
Class	Class A	10	12.20%
	Class B	34	41.46%
	Class C	38	46.34%
Gender	Male	15	18.29%
	Female	67	81.71%
Total		82	100%

Instruments

The research instrument used in this study consisted of a questionnaire and interview questions developed by synthesizing findings from the prior literature. The questionnaire consisted of 66 items divided into two main sections to measure distinct constructs. The first section measures the types of smartphone distraction during reading activities using a 5-point Likert scale ranging from 1 (Never) to 5 (Always), with 2 (Seldom), 3 (Sometimes), and 4 (Often). The second section assesses contributing factors of

smartphone distractions using a 5-point agreement scale: 1 (Strongly Disagree), 2 (Disagree), 3 (Undecided), 4 (Agree), and 5 (Strongly Agree).

In the first section, several experts proposed various forms of digital distraction, including social media and instant messaging activities (Kaur, 2025), system notifications and incoming calls (Abidin, 2023), and gaming and music listening activities (Pérez-Juárez et al., 2023). Based on these classifications, the researcher summarized them into 10 types most relevant to students’ current reading activities. This

integration process ensured that the instrument not only adopted but also encompassed all digital distractions students actually experience. Furthermore, C Wang (2022) categorized the 10 types of smartphone distractions that students experience in online learning into multitasking,

unexpected interruptions, and consistent interference (see Table 2). The questionnaire in this section consisted of 30 items.

The second section assessed 12 contributing factors of smartphone distraction, adapted from the general digital distraction

Table 2. Indicators of instrument type of smartphone distraction

No	Types	Indicators	Examples
1	Texting	Diverting attention from reading to sending or replying to text messages.	"I send messages unrelated to the lesson while reading in class."
2	Email	Opening and reading emails or email notifications in a reading activity.	"I read e-mail even though I am reading in my class."
3	Social media and entertainment apps	Delaying reading because of the urge to check social media notifications or scroll during a reading activity.	"I open social media like Instagram, TikTok, or Facebook while reading."
4	Web browsing	Browsing the internet for unrelated or additional information while reading.	"I browsed unrelated websites in reading class."
5	Gaming	Feeling tempted or playing games on smartphones to overcome boredom during reading activities.	"I play games to avoid feeling bored while reading in class."
6	Notification or Pop-Up message	Divides attention or stops reading to read or reply to pop-up notifications, such as messages.	"I stop the reading process to read or reply to pop-up notifications on my smartphone."
7	Incoming calls	Answer or experience incoming phone calls during a reading session.	"I answer phone calls even when I am supposed to focus on reading."
8	Watching Video	Accessing video applications (such as YouTube or TikTok) as a form of procrastination when one should be engaged in reading.	"I stop reading to watch videos on platforms like YouTube, TikTok, or Instagram Reels."
9	Sound from Smartphones	Distracted by a ringtone like a reminder, notification, alarm, or others while reading.	"I check my smartphone suddenly rings while I am reading in my course."
10	Listening to Music	Distracted by listening to music from a smartphone that has a purpose for fun while reading.	"I listen to music on my smartphone or others while reading in my class."

literature and customized to the context of reading activities on a smartphone. Throuvala et al. (2021) and Wang et al. (2022) emphasize the role of psychological factors such as attentional impulsiveness, emotion regulation, online vigilance, anxiety, and the Fear of Missing Out (FoMO). Furthermore, low self-regulation and

poor device control make students more susceptible to multitasking and procrastination (Deng et al., 2024; Bowles, 2024). These distractions are exacerbated by external factors such as persuasive app design, distracting notification systems, and classroom influences (Graben et al., 2022; Oh et al., 2022; Martin et

al., 2025). Overall, academic pressure contributes to increased reliance on smartphones, which ultimately disrupts depth of focus while reading (Jin et al., 2024). The questionnaire in this section consisted of 36 items.

The appropriateness of the 30-item scale in the first section and the 36-item scale in the second section is ensured by statistically testing them using Pearson Product-Moment Correlation in a pilot study conducted three times with 30

Table 3. Indicators of instrument contributing factors of smartphone distraction

No	Factors	Indicators	Examples
1	Attentional Impulsiveness	Difficulty controlling attention and maintaining focus in reading activities.	"I find it difficult to keep my attention on the reading without opening other features on my smartphone."
2	Online Vigilance/FoMO	Urgency of interacting with other online content besides reading text.	"I worry about missing updates on social media while I am reading in class."
3	Multitasking and Task Switching	The habit of engaging in multiple reading activities.	"I feel capable of doing several digital activities at once while reading."
4	Emotion Regulation and Mental Health	Other features smartphones use to divert emotions while reading.	"When I feel stressed or anxious, I stop reading and open other apps to feel better."
5	Low Learning motivation	Student interest in learning (reading) activities.	"When reading feels boring, I prefer to do other things on my smartphone instead."
6	Digital Self-Control	The students' ability to set targets and monitor their actions to manage smartphone use and reduce smartphone distractions.	"I struggle to stop myself from opening unrelated apps while reading in class."
7	Ease of Access to social media	The quick and easy way to open social media apps on a smartphone	"I feel easily tempted to open social media because it is very easy to access on my smartphone."
8	Easy internet access	Easy internet access allows students to freely open various applications or websites while reading.	"I often switch to other online content while reading because the internet is easily accessible."
9	Notification and Pop-up System	The application's structural design causes frequent interruptions and disrupts focus.	"Pop-up messages draw my attention away from the reading material."
10	Classroom environment	Distractions caused by friends or people around who are using their smartphones.	"I stop reading when I see classmates using their phones for non-academic activities."
11	Academic pressure on screen	Stress from schoolwork and on-screen info makes it hard to stay focused.	"When I see a new task or instruction pop up on my screen, I immediately stop reading to check it."
12	Design of smartphone & appealing interface	An attractive smartphone design encourages opening other content while reading.	"Visual features and layouts inside apps or notifications tempt me to switch away from the reading material."

students each. According to Sugiyono (2021), an indicator is considered valid if its *r*-count exceeds the *r*-table value at the 5% significance level. In this research, with 30 respondents for the pilot study, the critical *r*-table value was 0.361. The last statistical analysis showed that the empirical *r*-value for the 30 items on types of smartphone distractions ranged from 0.523 to 0.908, and the last statistical analysis for the 36 items on contributing factors showed that the empirical *r*-value ranged from 0.454 to 0.87. Since all items had *r*-values greater than the *r*-table value, the instrument was statistically validated for data collection. To test the questionnaire's reliability, Cronbach's alpha was used. The results were 0.97 for distraction types and 0.96 for contributing factors, both well above the 0.70 standard recommended by Hair et al. (2021), indicating a very high level of reliability.

Research Procedure

The research procedure was systematically executed in four main stages: (1) Instrument Validation, involving three pilot studies with 30 respondents each; (2) the questionnaire was distributed through Google Forms to 82 students for one week; (3) Participant Selection, purposively choosing 5 students representing the highest and lowest distraction categories based on questionnaire results. This small number was intended to explain the quantitative statistical results (Creswell & Creswell, 2018), and is supported by Guest et al. (2006), who state that 5 to 6 semi-structured interviews are sufficient to develop meaningful themes and useful interpretations within a homogeneous sample (4) Interview Data & Analysis: conducting audio-recorded and verbatim-transcribed semi-structured interviews, followed by quantitative data tabulation and qualitative thematic analysis,

Data Analysis Technique

Quantitative data analysis was conducted by categorizing collected responses into types and

contributing factors of smartphone distractions. All participants provided informed consent before data collection, with their identities and responses kept confidential to ensure privacy. Data analysis involved arranging the data into a stacked bar chart. Qualitative data were analyzed using Miles & Huberman's (1994) interactive model, comprising data reduction, data display, and conclusion drawing. In the reduction stage, interview transcripts underwent open coding to label specific distractions (e.g., sound from a smartphone), followed by axial coding to group them by type, and selective coding to establish the core themes. Additionally, member checking was conducted by sending interview summaries to informants via WhatsApp to confirm data accuracy. The correlation analysis was performed using IBM SPSS Statistics, and Spearman's rank correlation (ρ) was calculated. The correlation matrix was then visualized as a correlation heatmap in Microsoft Excel, where darker colors indicate stronger positive correlations (ρ). Statistical significance was determined at $p < .05$, $p < .01$, and $p < .001$. This research followed the ethical guidelines for research involving human subjects as stipulated by the Faculty of Teacher Training and Education, Universitas Riau.

■ RESULT AND DISCUSSION

This section presents the research findings, organized according to the three research questions. The first investigates the types of smartphone distractions experienced by students (RQ1); the second analyzes the contributing factors (RQ2); and the third examines the correlation between the types and the contributing factors (RQ3).

Types of Smartphone Distractions in Reading Activities

The analysis of the findings showed that students experienced several types of smartphone-related distractions while reading texts on their smartphones in class. Smartphone

sound is the most frequent type of smartphone distraction students experience. The stacked bar chart in Figure 1 illustrates the frequency of various

smartphone distractions across five levels: Never, Seldom, Sometimes, Often, and Always.

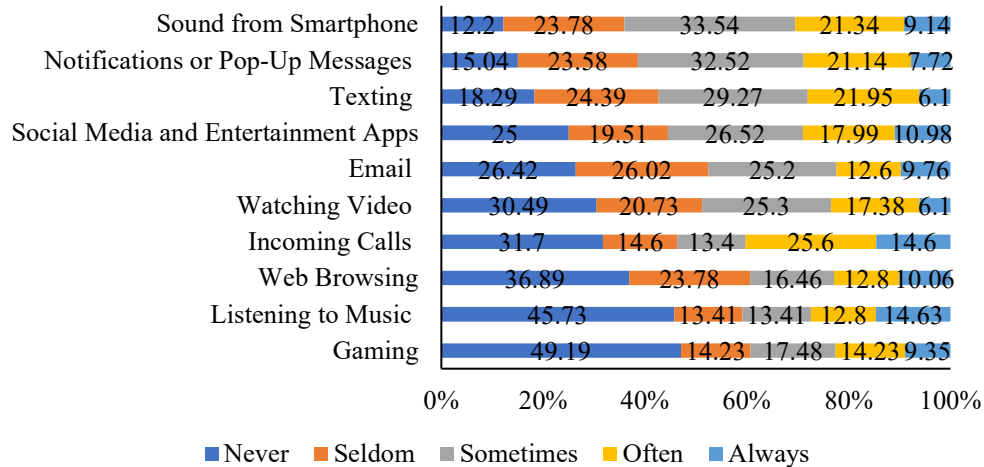


Figure 1. The frequency of smartphone distractions in reading

Sound from the smartphone

Smartphone sounds, such as ringtones or alarms, frequently disrupt the silence of reading. Only a minority of students reported never being disturbed, which triggers psychological stress such as surprise and embarrassment, as acknowledged by Nb: *"I would feel embarrassed eh because it's reading and it likely goes silent in the class"* and Dw *"If my phone suddenly rings... I feel embarrassed or surprised"*. However, the data shows reactive and defensive coping mechanisms. Students immediately take direct action to restore their focus, either by instantly turning off the sound, Rz: *"I will turn off the ee ringing mode"*, or refusing to be contacted after the reading activities, Mr: *"...I read text on my smartphone and there suddenly alarm or a ringtone, of course, I can sift automatically from the icon above the phone, em but eee usually it's not so important. So, I just dismiss it."* Unlike social media scrolling, which often leads to prolonged distraction, this interruption is short-term because in-class social awareness forces students to immediately refocus. This is aligned with research by Kaur (2025), which emphasized

that notification sounds are impulsive triggers that forcibly break deep concentration and divide cognitive resources, thereby affecting reading comprehension. *Notifications or Pop-Up Messages* Pop-up notifications act as immediate visual triggers that disrupt reading focus, with only a few students remaining unaffected. This sudden attentional shift causes students to completely lose their train of thought, as described by Nb: *"...see the first thing that I will do, of course, to check the notification. ee If it's an emergency, I would like to ee fastly reply it."* This data reveals that these pop-ups trigger a reflex that is very hard for students to resist, as emphasized by Dw: *"The most difficult part is eee when I receive a lot of WhatsApp notifications. Oh, I auto... automatically read."* Unlike smartphone sounds that can be muted instantly, these repetitive pop-up messages create a more intense distraction during reading; they act as a gateway that traps students in a long-term loop of losing focus and completely derails their understanding of the text. This is evidence by Tr, who said, *"I read on my phone, and then I got the notification. Moreover, after the notification appeared, I tried to open it. And then I ended up scrolling*

media.” These findings demonstrate that notifications are not just a momentary distraction, but rather a cognitive interruption that forces the brain to work harder to rebuild reading comprehension. These findings confirm that notifications are the most prevalent form of digital distraction experienced by students while studying (Pérez-Juárez et al., 2023; Abidin, 2023; Kaur, 2025).

Texting

Texting or constantly replying to chat messages during reading significantly divides students’ concentration and lowers their comprehension. This distraction depends on individual roles and levels of self-regulation. Some students, like Mr, experience disturbance out of academic necessity as a chairperson, admitting, “...*Because I am chairperson... sometimes the lecturers often chat even when I’m in the class, so of course...I need to constantly check my email or chat in case the lecturer needs an urgent reply from me.*” Conversely, for students with lower self-regulation like Dw, these notifications become reactive distractions, stating, “*I often get distracted by chat notifications and end up replying to them.*” Meanwhile, students with high self-regulation like Rz maintain focus by treating non-urgent messages strictly as a post-task reward, as he shared: “...*turn on the data. I will get a lot of notifications. So, I prefer, I have to turn off the data. So, if I have 10 minutes of reading time and then I finish before...I usually check my phone...I check for mail, stickers, tokens, something...*”. This comparative pattern proves that texting affects students differently based on role demands and personal impulse control. Passive messages, such as notifications, add cognitive load that significantly hinders students’ attention and learning in higher education (Plass et al., 2010; Pérez-Juárez et al., 2023; Rabah, 2024).

Social Media and Entertainment Applications

Social media and entertainment apps pose a major challenge to self-control, disrupting students’ concentration during reading activities. The temptation often begins with an appealing pop-up alert that triggers an immediate urge to open entertainment platforms, as experienced by NB who admitted, “*I received a notification about a gameplay... so I was like I kind of want to open it...*” once students give in to this curiosity, they quickly get caught up in a major distraction; for instance, Tr confessed, “...*then I end up scrolling social media or chatting... and I forget about what I’m reading.*” This shows that short-form content and entertainment apps can easily trap students in prolonged distraction. However, the data highlight a clear contrast in student behavior, with high-self-control students like Rz successfully resisting this temptation by treating social media as a post-task reward, stating, “*I have to finish the text in that time... and then after that I can enjoy social media.*” This finding aligns with Abidin (2023), who emphasized that social media distractions during digital learning activities trigger “cognitive compensation,” in which participants unconsciously allocate more attentional resources to entertainment content than to the task.

Email

Email is less distracting than texting, with a significant number of students reporting that they are ‘Never’ disturbed by it. For some, an email alert triggers non-academic curiosity that derails their focus; however, students with high self-control successfully neutralize this threat by treating email strictly as a formal, urgent information tool. This is demonstrated by Mr, who checks the smartphone for administrative necessity but maintains strong boundaries: “*I need to check to constantly check my email or chat... but so far I manage to control myself*

to not prioritize the chat.” Similarly, Rz just checks email notifications to know urgent tasks before reading, stating, *“I usually check the email first... So if there is an urgent thing that we have to do at that time, so we know gitu.”* This comparative profile shows that highly regulated students do not let email become a distraction; instead, they quickly process formal notifications for urgent updates, allowing them to focus on their reading without anxiety. This aligns with Pérez-Juárez et al. (2023)’s findings that students use email during class.

Watching Video

Watching video is a distraction that halts the reading activities, as bored students actively turn to it for quick entertainment. This distraction is often triggered by boredom and social cues, causing students to shift their focus instantly. For example, Nb admitted that cognitive fatigue drives her to seek entertainment, stating, *“Sometimes when I’m still reading, and I’m kind of bored ee, I open the app and watch several videos...”* This urge is further intensified by peer interactions on social media; as Mr confessed, even when trying to stay disciplined, receiving a video creates an irresistible temptation: *“...open the video that my friends shared with me... I have the urge to open it, and I accidentally swipe reading...”* Once opened, short-form content traps students in an endless scrolling cycle. This comparative profile shows that boredom and peer-shared videos pose a high risk of immediate loss of focus. This phenomenon aligns with Abidin (2023), which reports that students often struggle to manage their attention when exposed to digital content. Moreover, recent global evidence from Barton and Smyth (2025) confirms that rapid context switching in short-form videos causes an immediate cognitive decline, explaining why these quick digital interruptions easily derail a student’s deep reading focus.

Incoming calls

Incoming calls are an absolute distraction that immediately interrupts students’ attention during reading. Unlike notifications, which can be passively ignored, the calls demand immediate behavioral action. Students manage these intrusive disruptions by setting proactive boundaries. This controlled pattern is evident in Rz, who completely shuts out the distractions: *“When someone calls me ee in the class or in reading time, I will just ignore it...”* Similarly, Mr maintains focus by neutralizing the alert and delaying her response, confessing, *“If it’s incoming calls... sometimes I silence the calls and later after finishing class. I will explain...”* This proves that highly regulated students protect their concentration by returning calls only after completing their reading task. However, Nb explained that he would first check the caller’s identity before deciding to answer or ignore it: *“I would like to check first ee who the person is... If it’s like my parents or someone that ee not usually call me, I would like ee to use myself to answer it. However, if it’s just like my friends or someone, I would like to hang up.”* This aligns with Abidin (2023), which states that incoming calls not only break focus but also trigger negative emotions such as anxiety and disappointment.

Web Browsing

This distraction typically drives students to seek irrelevant information, where a simple search can escalate into incessant browsing and ultimate disengagement from the reading. The data show that students’ use is a significant source of distraction, as they tend to search for irrelevant information. This finding is dualistic, reflecting a conflict between information searches that support and those that interfere with reading. Interview data revealed “functional distractions.” Mr used her smartphone to look up difficult

vocabulary: *"Sometimes I also browse the meaning of some Words that I still don't know or am confused about the meaning."* At the same time, Dw turned to web browsing when her focus waned to restore comprehension. This phenomenon aligns with Abidin (2023), which states that students find it difficult to constantly switch between learning apps or reading materials and other browsers.

Listening to music

A low-frequency distraction, with almost half of students reporting "Never" to this distraction because students use it as a mood changer based on the complexity of the text. This is evident in Nb, who restricts background audio to easy text, stating, *"I like to listen to music and reading eee session when the material is not really academic or maybe not hard."* Similarly, Mr limits music to informal environments: *"...but sometimes at home I may listening to music when reading my ee Exercise."* This demonstrates that students use music to alleviate boredom and to enhance the complexity of the text. Consequently, background music remains a controlled, non-disruptive tool that is easily suppressed when high-level focus is required. Although music adds cognitive load that hinders academic reading (Kaur, 2025), students sometimes use it as a "shield" to isolate themselves from environmental noise (Pérez-Juárez et al., 2023).

Gaming

Gaming is the least common source of distraction during reading activities. Students naturally avoid it because of a lack of interest and perceived risks. This is evident from Rz, who stated, *"During the reading time... I do not like to play games. So, it do not disturb me..."* Similarly, Tr expressed their disinterest by noting, *"I'm not very interested in gaming while reading. So, I don't have experience..."* This avoidance is also driven by fear of consequences, as Nb emphasized: *"For gaming, I never think*

to play because it ee might be very risky." Therefore, gaming poses a negligible threat to students' concentration and reading quality compared to other digital distractions. The drastic decline in reading quality due to multitasking is reinforced by the significant relationship between physical distractions and digital distractions in the learning environment (Kostiæ & Ranðeloviæ, 2022; Pérez-Juárez et al., 2023).

The findings indicate that smartphone sound is the most frequent distraction during reading activities. This suggests that auditory distractions are difficult for students to ignore because notification sounds automatically attract attention and disrupt concentration. This factor's dominance over other distractions, including visual distractions, is strongly influenced by psychological and social factors within the classroom environment. While visual distractions such as checking notifications, scrolling through social media, and texting are passive and can be ignored or hidden, the sudden sound of a smartphone breaks the classroom silence and immediately creates uncomfortable social awareness. As revealed in the interview data, students experience psychological stress, such as sudden shock and embarrassment, as several students acknowledged in the interviews, because the sound exposes them to the entire class. This social pressure forces an immediate and immediate shift in attention. Students cannot slowly return to reading; instead, they are forced to immediately use coping mechanisms, such as turning off the sound, as several students stated in the interviews, simply to alleviate the social discomfort. Therefore, implementing silent modes is essential in reading activities.

This finding supports Attention Theory proposed by Kahneman (1973), which states that human attention has limited capacity. When students receive multiple stimuli simultaneously, such as reading texts while hearing smartphone sounds, their attention becomes divided. As a result, students experience difficulties maintaining concentration and comprehending the reading

material effectively. This result is also consistent with Güngör (2024), who reported that notification sounds are disruptive forms of digital distraction in educational settings. However, this finding differs from Pérez-Juárez et al. (2023), who identified social media engagement as the dominant distraction among students in Spain. This difference suggests that distraction patterns may vary depending on students' habits and learning environments.

Factors Contributing to the Smartphone Distraction

The findings of 12 contributing factors highlight that internal psychological factors play a major role in smartphone distraction during reading. This is evidenced by high agreement scores for factors such as emotion regulation, low learning motivation, and attention impulsiveness, compared to external factors like easy internet access, as presented in Figure 2.

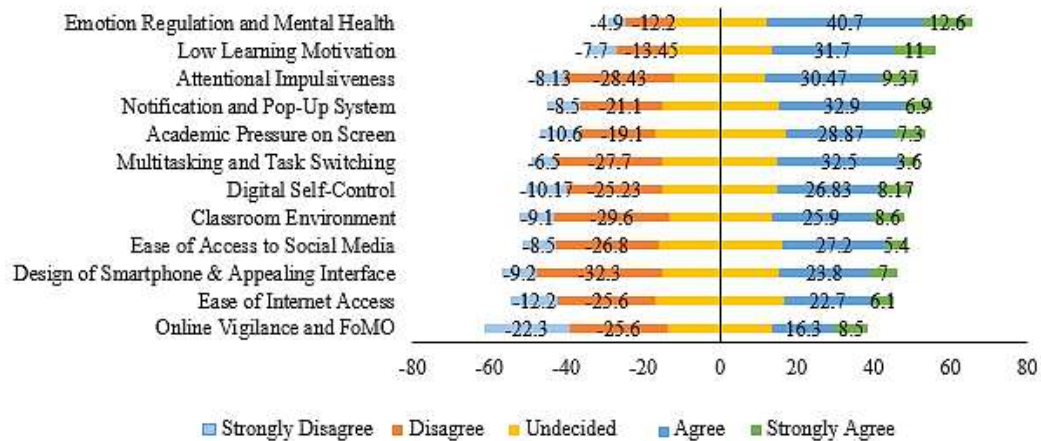


Figure 2. The agreement of contributing factors in reading

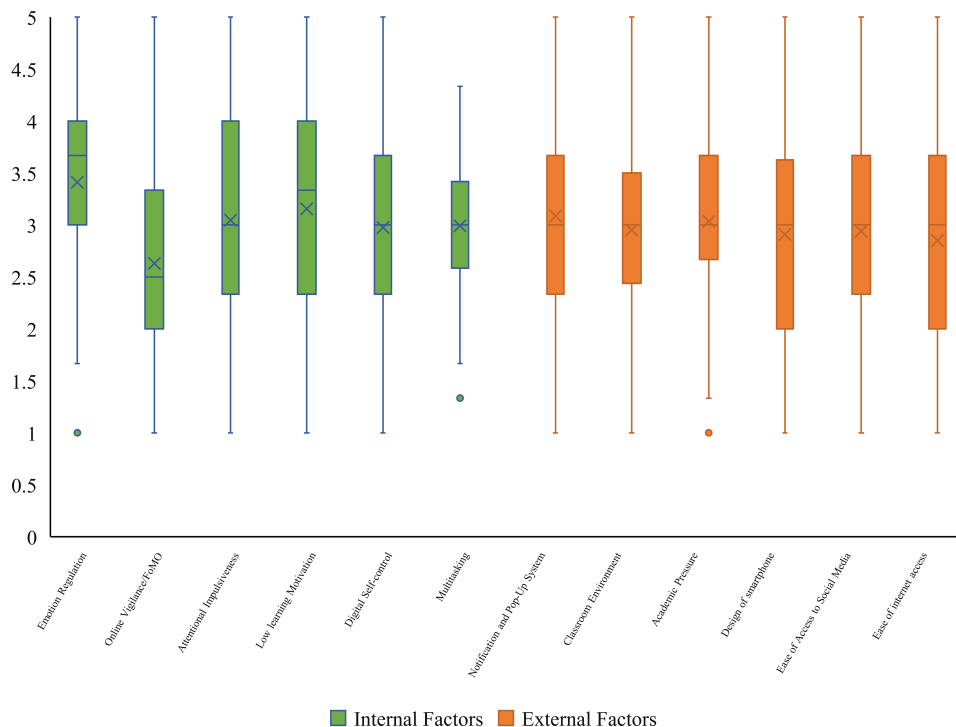


Figure 3. Distribution of internal and external contributing factors

Based on Figure 2, emotional regulation is the most frequent internal reason students turn to other things on their smartphones while reading in class. Conversely, the fear of missing out (FoMO) is the least contributing factor to smartphone distractions. Furthermore, Figure 3 shows the differences in how these two groups of factors influence students. The graph for internal factors shows variation. This indicates that students' internal reasons vary widely; some have a very strong influence, while others have a very weak influence. In contrast, the graph for external

distractions appears much flatter. This indicates that distractions from the surrounding environment affect almost all students equally.

Additionally, the conceptual framework in Figure 4 illustrates how internal contributing factors and external contributing factors interact to create smartphone distractions. These distractions, ranging from entertainment to texting, lower working memory and split focus and cause triggering behavioral responses such as muting smartphones (device) reflexively

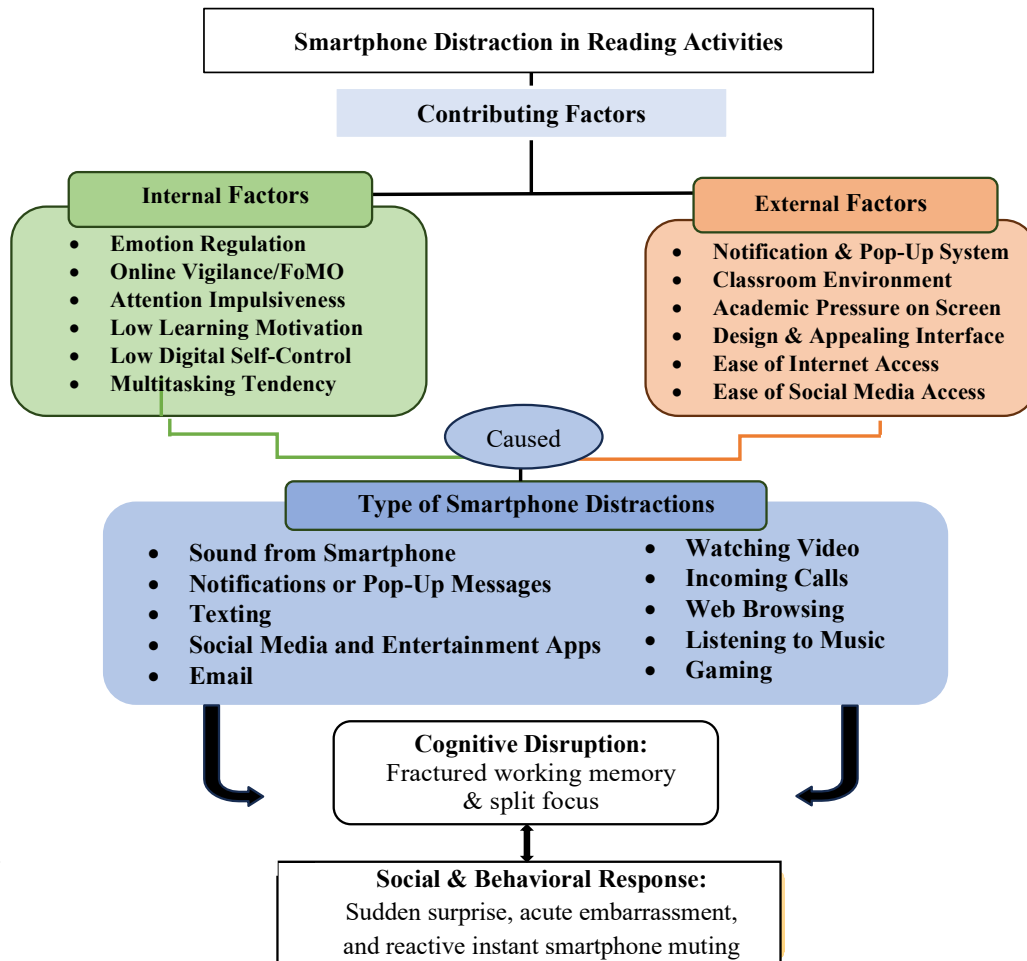


Figure 4. Conceptual framework of smartphone distraction in reading activities

Emotion regulation and mental health

Emotion regulation and mental health are the leading factors driving smartphone distractions. Students experiencing negative

emotions or mental fatigue struggle to resist the distractions, as exemplified by Rz feeling stressed when dealing with uninteresting reading texts, "...if we read a text that we do not like at all...

it just makes us feel pressure. So, if this happens and then the notification is coming, it will easily distract us because we already mad that text" Mr, who experiences boredom due to linguistic barriers, "... *when the topic is hard or difficult Yes, sometimes I feel tired because there are so many words that I don't understand...*" which indicates that when students fail to regulate their boredom or frustration, they tend to turn their attention to other feature on s as a form of instant emotional other things such as watching video, texting, scroll social media to relieve the burden of reading. This phenomenon aligns with Throuvala et al.'s (2021) concept, which views mobile phone distraction as a coping strategy (emotion regulation) to avoid negative emotions. This action actually drains working memory.

Low learning motivation

Low motivation drives students to seek digital escapes from boring texts. This is exemplified by Tr, who immediately switches platforms upon experiencing boredom, "*When I'm bored reading, I scroll on social media,*" and NB who emphasized that a mismatch in material interests triggers similar behavior, "...*First thing, I'd be bored because the materials might not really be into me. And what I do is... open other apps...*" proving that weakened motivation drives them to switch applications to avoid boredom deliberately. This phenomenon is supported by Deng et al. (2024), who stated that students tend to multitask on material that is considered to have no added value. Wang et al. (2022) explain this behavior as a form of procrastination that actually drains brain capacity, so that important information from reading fails to be processed optimally due to the loss of internal motivation that should function as a focus protector.

Attention impulsiveness

Attentional impulsiveness indicates that smartphone distraction is frequently an

unconscious phenomenon, where compromised attentional control triggers reflexive behaviors. This psychological vulnerability was confirmed by Tr who admitted that his attention was divided by curiosity, "...*The notification is distracting for me and it makes me curious about who is in the notification,*" and emphasized by Dw's habitual bias of mechanically replying to incoming messages, "...*when I receive a lot of WhatsApp notifications. Oh, I... automatically read and send the messages,*" where this instant action flow proves that impulsive urges can destroy reading concentration in an instant. These findings reinforce Throuvala et al.'s (2021) theory that attention is a limited resource vulnerable to distraction; the failure of inhibitory control in resisting the urge to use a smartphone suggests that the main challenge lies not with the device, but with students' internal focus management.

Notification and pop-up system

The notification and pop-up system is a major external contributing factor to smartphone distractions. Tr exemplified pointed out that multimedia message formats act as powerful triggers for shifting focus. "...*It's usually just from WhatsApp, the picture or voice notes,*" and is reinforced by Dw regarding the cycle of distraction that ends in retaliation, "*I often get distracted by chat notifications and end up replying to them.*" This phenomenon is emphasized by Nb's failure of self-regulation when trying to resist the reflexive urge of incoming notifications, "... *so ee at that moment I received a notification about a gameplay about a game so I was like I kind of want to open it just to like a like a pic, but I can't do it.*" This flow of actions shows that the smartphone's pop-up architecture successfully exploits students' attention while they read. This aligns with Graben et al. (2022): notifications impair cognitive performance by forcing the brain to task-switch, highlighting focus mode as an essential strategy to prevent digital distractions during reading.

Multitasking tendency Multitasking creates the illusion of productivity, making students feel comfortable doing it. This decrease in focus was acknowledged by Rz, who stated that reading while accessing social media is ineffective, “...reading and using other features on social media, it’s not working effectively if we do that at the same time,” and supported by Dw, who immediately lost her reading memory, “...when I start reading to check something else, I forget what I read. It makes me lose my focus.” This obstacle was finally overcome by Mr, who emphasized that reading requires full concentration without distraction: “So in my opinion reading especially cannot be disrupted by anything. So, I don’t think I am capable of reading while doing other things”. This gap between impulsive habits and conscious awareness confirms Wang et al.’s (2022) research, which found that split attention due to constant task-switching actually depletes working memory capacity. Believing in multitasking is merely a psychological barrier that compromises self-discipline and prevents deep information processing.

Academic pressure on screen

Academic Pressure on Screen triggers a struggle for attention between other assignments and reading. Rz postpones distraction attempts by prioritizing reading when informed about group assignments: “If he got the notifications task. He told me that we got a task, blah blah blah. I will respond that I have to read it first; when I finish, I will work with you together.” On the other hand, Mr admits to still being distracted by new assignment notifications. However, she quickly exercises self-control after briefly checking the timeframe: “If my friend said that the uh the Thing that appeared on her phone is a new assignment. Of course, I still get distracted, and I still love to check, but usually I will look at the notification briefly. Oh, it’s just an exercise. Oh, the time is tonight. So I

just dismiss the notification... To read it later and focus on my reading.” According to Jin et al. (2024), this demand for instant responses triggers “anxious connectivity” that increases academic anxiety. This demonstrates the need for an academic communication culture that does not demand instant urgency so that students’ cognitive processes are not continuously fragmented by unnecessary mental burdens.

Digital self-control

Students’ digital self-control is divided into two groups of perceptions. First, Device-Based Regulation: Mr chooses to use silent mode: “To maintain my focus well, while I’m reading, usually I put my phone in ee silent mode...”, supported by Tr: “Sometimes I have to turn off the notifications in my reading” and Nb: “I like to use the DND or the not disturb mode if the notification won’t stop coming”. Second, Mental Control, reflected in the perception of RZ who focuses on completing reading sequentially: “...I have to finish this first before I do something...”, and DW who deliberately ignores social media to maintain attention by confess: “I usually don’t open it because I know if I open it once I might not go back to my reading” This combination of perceptions proves that without a clear Self-Regulated Learning strategy, reading activities will always be distract by the other features on smartphone, as the smartphone’s dual identity as both a reading and entertainment tool continuously divides cognitive load if not actively managed (Bowles, 2024; Deng et al., 2024; Wang et al., 2022).

Ease of access to social media

Ease of Access to Social Media demonstrates the conflict between technological convenience and self-control. Tr acknowledged that distractions often occur unintentionally, as expressed in interviews: “Sometimes I start browsing or scrolling on social media or other things and forget about my reading...”

However, their perceptions emphasized that technology itself is not the primary cause of focus failure. However, rather how individuals manage it: *"...I can't really blame the internet or the social media because there are such technologies, but the point is how you use them."* Consistent with Bowles (2024), the "dual identity" of smartphones as both learning and entertainment tools decreases students' commitment to learning compared to laptops, making device-management skills crucial for protecting focus.

Ease of internet access

Easy Internet Access focuses on the dilemma between academic needs and the risk of digital distraction. An internet connection is a necessity to access course materials, as stated by Mr: *"...sometimes they do ask us to search an article or journal uh online... So yes, I connect to the internet to read online text."* However, this necessity can also introduce distractions, though students note that the actual impact remains neutral and depends entirely on self-control. Nb: *"Yeah, I think ee with the internet stuff it can get more easily to be distracted while reading."* This emphasizes that easy internet access acts as a double-edged sword that requires Self-Regulated Learning strategies to avoid increasing cognitive load when reading. This aligns with Deng et al. (2024), who argue that high internet accessibility triggers spontaneous task-switching by creating a false sense of security that distracts students from their primary task.

Classroom environment

Classroom Environment shows that digital distractions in the classroom occur due to social influence from peers. First, there is a tendency to mirror attitudes (imitating behavior) when seeing others open their devices, as acknowledged by Tr: *"When my friend is using their smartphone for entertainment, I feel like I should do the*

same thing." and emphasized by Dw: *"I check because my friend opens it too."* This interaction often begins with discussing college assignments before finally moving to social media, as experienced by Rz (Q7): *"... others with me open and scroll TikTok... He telling me that, we have a task..."* This phenomenon shows that an unconducive classroom environment accelerates smartphone distractions that make students lose focus. This aligns with the environmental dimension of the TPE framework (Martin et al., 2025), which asserts that smartphone distraction is a product of the classroom's social conditions, not simply an individual issue. Without clear, cohesive device-usage rules, a single student's loss of focus can trigger a chain reaction that undermines the academic atmosphere collectively and systemically.

Design of smartphone & appealing interface

Smartphone design and appealing interfaces significantly drive students' impulsive checking behavior, with elements like image notifications and stickers acting as primary stimuli. Rz confirms this: *"...if I get some notification like picture or stickers, eee usually check it first... just want to know, what are they sending me for."* This phenomenon proves that sensory stimulation from the smartphone screen often disrupts reading focus because it triggers an attention split. Tr states this: *"...sometimes the screen makes me want to check the notification instead of going back..."* This pattern confirms that addictive interface design consistently increases students' cognitive load if not intervened with strict self-control. These findings support Oh et al.'s (2022) persuasive design concept and Martin et al.'s (2025) TPE framework, in which instant visual stimulation lowers students' self-control thresholds and outcompetes the higher cognitive demands of academic texts.

Online vigilance and fear of missing out (FoMO)

Online Vigilance and FoMO show that the fear of missing out on information triggers students' anxiety while reading. The worry about important messages was acknowledged by Dw: "...I feel worried that it may be an important message..." which was emphasized by Tr: "...I feel like I'm missing out on something important..." and Nb: "...I feel like I'm missing something." This phenomenon demonstrates that the urge to remain digitally alert overwhelms the mind, thereby disrupting focus during reading activities. This phenomenon, which Throuvala et al. (2021) term online vigilance, creates an attentional bias that inhibits deep processing as students remain preoccupied with the need for validation and social control. Consequently, this psychological burden fragments the reading process, shifting it from a focused task into one constantly disrupted by the urge to check smartphone updates (Wang et al., 2022). Smartphone distractions during reading stem from the interaction of internal and external factors. The research findings confirmed that the main triggers of this phenomenon were dominated by aspects of emotional regulation and mental health, which ranked highest in agreement. This scientifically proves that when imagined in academic texts, students tend to exploit smartphones as an instant coping mechanism to escape mental fatigue, anxiety, or boredom. This causal analysis also challenges assumptions about Fear of Missing Out (FoMO). Quantitative data ranked online vigilance and FoMO as the least significant factors due to low respondent agreement. Interestingly, qualitative interviews revealed that these low scores occurred because students' checking other smartphone features was driven by the functional need for urgent academic updates such as class schedules, assignments, and messages from parents/friends, rather than simply a desire to follow social media trends. This

suggests that while their attentional shifts were triggered by social anxiety about missing important external information, the underlying problem stemmed from weak internal cognitive defenses, reinforced by low learning motivation and high attentional impulsivity. This psychological vulnerability crippled students' digital self-control. Consequently, when external stimuli such as system notifications or engaging user interfaces were activated, students immediately disengaged from reading. They reflexively shifted to lower-effort activities, such as scrolling social media, texting, and playing games. The cumulative integration of dysfunctional emotion regulation and external triggers ultimately fragmented working memory and disrupted focus. This cognitive impairment not only decreases reading comprehension but also triggers spontaneous behavioral adjustments when audio interruptions occur, with students reflexively turning off their devices as a coping mechanism to cover up their acute shock and social embarrassment in class. This finding is consistent with Wang et al. (2022), who reported that psychological factors such as anxiety, low motivation, and FoMO significantly contribute to digital distraction among students. Similarly, Throuvala et al. (2021) explained that online vigilance creates a constant urge to stay connected to digital communication, making students highly sensitive to smartphone notifications.

The dominance of psychological factors indicates that smartphone distraction is not solely caused by technology itself, but also by students' emotional and cognitive conditions. Therefore, strengthening emotional regulation and self-control strategies may help students reduce distractions.

The Correlation Between Contributing Factor and Type of Smartphone Distraction

The correlation analysis was conducted to understand how internal and external factors contribute to smartphone distraction in reading

activities. This correlation heatmap shows the direct relationship between specific contributing factors and types of smartphone distraction.

Internal contributing factors to types of smartphone distractions

This section details how internal psychological factors relate to students'

smartphone distractions during reading activities, as shown in Table 2.

These correlations demonstrate that students' psychological factors significantly influence their susceptibility to smartphone distractions while reading. The strong correlation between Attention-Impulsiveness and notifications indicates that students with weak

Table 2. The correlation of internal contributing factors and types of smartphone distractions

Internal Factors	Attention Impulsiveness	Online Vigilance /FoMO	Multitasking	Emotion Regulation	Low Learning Motivation	Digital Self-control
Jenis Distraksi						
Texting	0.414***	0.455***	0.398***	0.068	0.226*	0.396***
Email	0.271*	0.428***	0.342**	0.107	0.115	0.257*
Social media and entertainment applications	0.460***	0.544***	0.523***	0.238*	0.275*	0.422***
Web Browsing	0.406***	0.519***	0.412***	0.058	0.109	0.524***
Gaming	0.239*	0.415***	0.387***	-0.059	0.002	0.203
Notifications or Pop-Up Messages	0.613***	0.557***	0.546***	0.215	0.358***	0.287**
Incoming calls	0.389***	0.457***	0.441***	0.057	0.067	0.186
Watching Video	0.582***	0.597***	0.552***	0.268*	0.345**	0.454***
Sound from the smartphone	0.488***	0.536***	0.506***	0.172	0.259*	0.338**
Listening Music	0.278***	0.447***	0.133	0.038	0.111	0.358***

*p < .05, **p < .01, ***p < .001.

Note: Darker blue shades indicate stronger positive correlation values.

attentional control will immediately shift focus as soon as a stimulus arrives on their devices. Furthermore, moderate levels of Online Vigilance/FoMO confirm the presence of social anxiety that compels them to constantly check social media. Meanwhile, the correlation with Emotion Regulation is weak, indicating that impulsivity and social anxiety are far more dominant in students' experienced distractions than emotional regulation.

External contributing factors to type of smartphone distraction

This section details how external environmental factors relate to students' smartphone distractions during reading activities, as visually mapped in Table 3.

Based on Figure 6, the notification system is a major distraction through notifications (visual messages) and smartphone sounds. Students feel compelled to check notifications that appear on

Table 3. The correlation of external contributing factors and types of smartphone distractions

External Factors	Ease of Access to Social Media	Ease of Internet Access	Notification and Pop-Up System	Classroom Environment	Academic Pressure	Design of smartphone & appealing interface
Types of Distractions						
Texting	0.226*	0.312**	0.363***	0.355**	0.301**	0.348**
Email	0.105	0.258*	0.319**	0.173	0.162	0.285**
Social media and entertainment applications	0.384***	0.467***	0.289**	0.29**	0.215	0.374***
Web Browsing	0.309**	0.418***	0.249*	0.337**	0.32**	0.524***
Gaming	0.163	0.17	0.163	0.302**	0.244*	0.406***
Notifications or Pop-Up Messages	0.459***	0.328**	0.559***	0.409***	0.298**	0.487***
Incoming calls	0.311**	0.303**	0.377***	0.318**	0.281*	0.417
Watching Video	0.477***	0.544***	0.275*	0.378**	0.318**	0.513***
Sound from the smartphone	0.415***	0.371***	0.585***	0.24*	0.255*	0.387***
Listening Music	0.171	0.238*	0.132	0.26*	0.228*	0.318

the screen immediately to ensure they do not miss important messages. The app's attractive interface and easy internet access make it easy for students to switch to multitasking, such as web browsing or watching videos. These distracting smartphone features ultimately reduce deep focus on academic reading.

The combination of internal and external factors directly triggers various types of smartphone distractions. Internally, impulsiveness and social anxiety (FoMO) keep students psychologically alert. External factors exacerbate this, such as sound and visual messages from the notification system that appear on the same screen while students read English text. Together, these factors undermine students' focus, causing them to switch immediately to multitasking distractions such as browsing the web, scrolling social media, or watching videos. The ease of internet access and the attractive appearance of the applications ultimately keep students engrossed in surfing, breaking their concentration while reading.

CONCLUSION

This research concludes that smartphone distractions in reading activities are closely related to students' self-regulation abilities, not solely due to the presence of digital devices themselves. This research shows that students' reading focus is highly susceptible to distractions from sounds, emotional regulation, and impulsive responses when faced with difficult texts. These findings highlight the importance of strengthening emotional regulation and self-regulation strategies to support academic reading activities in digital environments. The novelty of this research lies in its specific exploration of smartphone distractions in reading activities for English Study Program students, thus providing a clearer understanding of how cognitive and emotional factors influence students' reading concentration. Therefore, lecturers are advised to develop learning strategies that encourage digital self-control and more focused reading habits, rather than merely restricting smartphone usage. Lecturers can

practically divide digital reading texts into smaller, manageable sections to reduce cognitive load, while collectively allocating a specific “notification-free” period at the beginning of the reading session to foster a highly conducive learning environment.

■ DECLARATION OF GENERATIVE AI USAGE IN THE WRITING PROCESS

During the drafting of this manuscript, the author(s) utilized Gemini AI to improve sentence structure and summarize some sections for greater clarity. Following this tool, the author(s) manually reviewed, edited, and corrected all content to ensure academic accuracy. The author(s) accept full responsibility for the final content of the article.

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