

# The Impact of Smartphone Usage on Academic Performance Among Students at King Abdulaziz University, Saudi Arabia: A Subgroup Analysis Based on Year of Study and Field of Specialization

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## Abstract

*The rapid development of smartphones has made them an inseparable part of education for university students, using such devices to communicate, learn, and access information. However, together with a lot of advantages, smartphones might turn into a source of serious disruptions, and their widespread use—especially in class—raises questions regarding the impacts on the academic progress of students. This research looks at the impact of smartphone addiction on the academic achievement of students at King Abdulaziz University in Saudi Arabia. To thoroughly examine if there is the differential impact of SA across the students, the academic year and the field of study were administered. Data of 103 students who completed this online survey were collected on addiction behavior, classroom usage, and academic achievement. The findings indicate that even patterns of use that are very addictive, like compulsive and only in the classroom, negatively affect advancement only to a tiny degree. However, academic maturity plays a huge role in how smartphones act as a divertive device. Indeed, senior students displayed self-regulated behavior and concentrated more on their academics than younger students, presumably by virtue of better time management skills honed during their longer study tenure. Addictive behaviors intercorrelate to indicate a cluster of dependent behaviors, while academic outcomes have not suffered significantly. Moreover, no significant variations in the impact of smartphone addiction on academic progress were observed among disciplines, which thus shows consistency in the effects across different fields of study. Such findings emphasize the complicated role of smartphone addiction in educational settings. While smartphone use is prevalent, its impact on learning outcomes depends on students' maturity and abilities to regulate their behavior. It recommends that universities should develop policies in computer usage and self-regulation specifically for young people around smart phone usage that would assist in enhancing students learning outcomes.*

**Keywords:** *Smartphone Usage, Academic Performance, Higher Education, Student Achievement, Educational Technology.*

## Introduction

Technological advancement in the use of smartphones penetrates many aspects in the society and learning not an exception. Mobile use has become a necessity in the daily life of university students for communication, information, learning factors (Rathakrishnan et al., 2021). However, their integration and availability has sparked controversy over their effects on students' grades or performance. These devices provide both educational benefits, like access to learning resources and collaboration tools, and potential distractions, like social media and gaming.

In Saudi Arabia, the integration of technology in learning has been one of its goals, especially at higher education institutions like King Abdulaziz University. However, recent studies showed an increase in concern about the detriments of their use in an excessive or improper manner on students' academic achievements. Therefore, understanding how the use of smartphones influences academic performance is critical in light of diverse students who have different needs and ways of studying.

Previous studies have actually looked at the overall correlation that may exist between smartphone usage and academic performance, and the outcome has been a mixed basket (Sunday et al., 2021). However, there is limited insight into whether this association differs by year of study or fields of specialization among the students. For instance, freshmen may be easily inclined toward waste instigated by phones, whereas seniors may better manage their time (Ahmed et al., 2020). Also, students studying subjects that imply practical placements, like engineering or medicine, may produce different effects than humanities students (Amez & Baert, 2020).

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This study intends to contribute towards filling this research gap by investigating the effects of smartphone usage on the academic achievement of students in KAAU particularly by exploring how the impact varies with subgroups of year of study and specialization fields. Thus, the research also aims to help understand how the smartphone is used in the academic context and how the resource could be effective for learning purposes (Gerosa et al., 2022).

The use of smartphones has become quite widespread and natural to an extent that these have reinvented communication and delivery of information. Understanding their background is, therefore, crucial to comprehending the motives, behaviors, and impacts that come with using them. Cell phone use has been becoming increasingly common since the introduction of the first iPhone in 2007 (Omer, 2020). This fact is also evidenced by statistics on smartphone addiction (Khan et al., 2019).

Advancement of technology has increased marking towards the mobility, flexibility, and dynamism sweeping through the use of smartphones. Present-day mobile phones are not only simple communication devices but are complex gadgets that are backed up by internet provision, applications, and multimedia facilities (Alinejad et al., 2022). Such adaptations added to the smartphones' functionalities mean more than tools for various aspects of life. All the different health risks come along when the overuse of smartphones is considered, such as eyestrain and neck and back pain; therefore, it is important to pay extra attention to our habits of using smartphones to be able to take care of our physical and mental health. One research conducted by researchers at Rutgers University revealed that students' use of smartphones for other than academic-related purposes during class reduces class performance. According to the study, students who practice the habit of using phones during class have lower class performance than those who do not (Yalçın et al., 2020). Learners who are engaged in this social media end up having low performance in their studies, poor study habits, and low self-control, as mentioned in the Journal of Behavioral Addictions article by Petrucco and Agostini (2023). As a student, the time spent using a smartphone should be regulated and be a student to fulfill the educational responsibilities encountered in school. Excessive use of smartphones gives several psychological risks, including addiction. According to recent research, it results in addiction symptoms, which include tolerance, withdrawal, and cravings. Thus, moderation is needed, which is accompanied by the reduction of the time spent with smartphones to mitigate the risks (Bukhori et al., 2019). Mobile phones have been postulated to have negative consequences on psychological health whenever used improperly. This is so because it is known for its negative effects, such as social isolation, disrupted sleep, and lack of exercise due to the time spent using smartphones. Notifications and alarms by smartphone can also lead to pressure and stress because it creates a sense of urgency to reply to messages immediately. Due to the negative effects of smartphone use on mental health, it is crucial to reduce screen time or have an opportunity to rest for enhanced well-being (Fook et al., 2021). This may lead to a feeling of overwhelm and makes the inability to log off quite detrimental to the individual, furthering mental health concerns. Otherwise, one should be careful as to the psychological risks that come with the usage of phones and not allow it to become more important than one's mental health.

## Objectives of the Study

The main objective of this research is to examine the impact of smartphone usage on the academic performance of students at King Abdulaziz University in Saudi Arabia. Specifically, the study aims to.

- Analyze how students at King Abdulaziz University use smartphones to support their academic learning.
- Explore how smartphone usage impacts academic performance across different years of study and fields of specialization.
- Assess which smartphone activities are most associated with academic performance metrics like GPA.

- Develop recommendations for optimal smartphone use to improve academic success for students and institutions.

### *Hypotheses*

H1: A significant negative relationship exists between smartphone usage duration and university student academic performance.

H2: The impact of smartphone usage on academic performance significantly differs across different years of study.

H3: The impact of smartphone usage on academic performance significantly differs among excessive use of social media and application used.

### **Literature Review**

The incorporation of mobile devices has also been one of the focuses of research in the context of education, with numerous studies evaluating students' readiness and perceptions towards m-learning (Tian et al., 2021). In general, there is a very positive attitude towards the use of mobile gadgets in student's learning activities. For example, Fu et al., 2021 assessed student readiness to engage in mobile learning from four perspectives: basic technological skills, proficiency, psychological preparedness, and financial capacity. The outcome showed that university students were not yet fully ready for mobile learning at the time. However, with increasing development and innovations in smartphone technology and competitive marketing that lowers prices, mobile learning has been made more available, even to low-income households.

Research has pointed to the current dual role of smartphones in an academic environment, serving both as education-enhancing tools and as sources of distraction. Shakoore et al., 2021 affirmed that when students are not permitted to use smartphones during lessons, their FoMO increases significantly, coupled with attention distraction and disconnection from learning. Sapci et al., 2021 also revealed that smartphones disrupt learning and hinder understanding, which consequently affects the students' performance.

Reviews of recent literature, like the one conducted by Santhi & Rajesh, 2020 laid the foundation for linking smartphone usage by university students to poor performance. This association is thought to be extremely worrisome given that students virtually universally own smartphones; 97% of the students own a smartphone (Pew Research Center, 2021), and 95% of them bring the Smartphone to class (Buctot et al., 2021). The high usage of smartphones requires an analysis of the effects of smartphones on academic performance.

Research has shown that smartphone use reduces GPAs via surveys (Grant et al., 2019) and real GPA data (Arumugam et al., 2020). Also, the overuse of smartphones has been said to result in poor quality of sleep (Demirci et al., 2015), lower life satisfaction (Lachmann et al., 2018), and high levels of anxiety, loneliness, and depression among university students (Domoff et al., 2020).

Within the classroom environment, smartphones are generally acting as major distractions. Learners may use their gadgets for social media browsing (Praveeni & Wickramasinghe, 2021), interact with friends (Kwok et al., 2021), or do several activities simultaneously during the lectures (Gligor & Mozoş, 2019). Such activities prevent students from focusing on what is being taught in the classroom and hinder their learning. Although a large amount of academic evidence exists on the negative relationship between in-class smartphone usage and academic performance (for example, Amez & Baert, 2020), not many investigations have been conducted on their impact on students' psychological health while in class, and even fewer used quasi-experimental research designs.

Anxiety is rife among college students, with 60.8% of them having experienced overwhelming anxiety in the past one year only, as demonstrated by Yao and Wang (2023). Prior research evidence also suggests that overall screen time is positively correlated with anxiety and depression levels in individuals (Lei et al., 2020). In a classroom environment, the notifications and information flow can be perceived as stressful and constant interference that can distract the students from the lectures (Al-Furaih & Al-Awidi, 2021). Furthermore, FoMO increases the level of stress demonstrated by the fact that students are cognizant of events that are happening outside of a learning environment (Li et al., 2019). Removing smartphones from the classroom may help reduce these anxiety levels (Alkhateeb et al., 2020).

The concept of mindfulness refers to a state of being when an individual is awake or attentive to his or her surrounding environment, and the above study shows a low level of anxiety among subjects (Bhandarkar et al., 2021). In classrooms, mindfulness in lectures correlates with academic performance (Azizi et al., 2019) as well as psychological well-being (Morales Rodríguez et al., 2020). Nonetheless, smartphone use reduces mindfulness by creating attentional interference during lectures, which hampers learning and increases anxiety.

However, some studies show that when the use of smartphones is done correctly, it may lead to improvement in academic performance. Goal-oriented engagement in information acquisition, assignments, and communication tools can benefit learning (Lane et al., 2021). These phone applications and social networking sites also help students and teachers communicate with one another (Maqableh et al., 2021). In addition, students who use their mobile phones for course-related activities may be more likely to find more content to understand all the concepts done for a course (Rashid & Asghar, 2016).

Given these conflicting findings, there is a demand to elucidate the connection between smartphones and academic accomplishment and psychological health. Specifically, the insights into how and to what extent digital engagement and distractions unfold depending on the years of university learning can be useful.

The present study aims to explore the influence of digital engagement on academic success, focusing on the distraction effects of smartphone use across university progression. By adopting a quasi-experimental design, this study examines the effect of smartphones on the understanding of course material and psychological health, specifically classroom anxiety and mindfulness. Students will be assigned to either a quasi-experimental group, where the students will be required to have their Smartphones security locked and handed to the lecturer before the start of the class to minimize contact with their Smartphones, or the control group, which will not have any such restrictions. This approach aims to disaggregate how engagement through smartphone usage influences academic performance and mental well-being in order to enhance the process of coming up with techniques for the effective use of digital gadgets, most especially in the context of learning.

## Methodology

This study employed a survey-based design to investigate the impact of smartphone usage on various aspects of student life, including academic performance, psychological well-being, and social behaviors. The sample consisted of 103 students from King Abdulaziz University, representing different academic years and fields of study, including Education Technology, Computer Science, and Law. The survey was distributed via WhatsApp and email to maximize accessibility and convenience for participants.

Prior to completing the survey, each participant received a consent form detailing the study's purpose, confidentiality protocols, and the voluntary nature of their participation. The form also informed participants of their right to withdraw from the study at any time without consequence. Only students who provided informed consent were allowed to proceed with the questionnaire.

### *Data Collection*

The data were collected through a structured questionnaire comprising three main sections, designed to capture a broad range of factors associated with smartphone use and its potential effects:

The first section included eight questions to gather essential demographic information, such as gender, academic level, and monthly expenses, as well as details regarding smartphone usage patterns. Participants reported their daily smartphone use in terms of total hours and primary usage times, providing a baseline for analyzing their general phone habits. The second section consisted of 13 items assessing students' attitudes and behaviors related to smartphone use, particularly in an academic context. Statements addressed areas such as study habits, perceived distractions, and dependency on smartphone applications. Respondents rated each statement on a Likert scale from 1 (slightly disagree) to 6 (slightly agree), reflecting the extent of their agreement and allowing for a nuanced understanding of their subjective experiences with smartphone use. Third section of the questionnaire comprised eight items aimed at measuring indicators of smartphone addiction. Participants rated their agreement with statements related to compulsive phone-checking, difficulty limiting use, and emotional reliance on their phones. This section also utilized a 6-point Likert scale, providing insights into the prevalence of addiction-related behaviors among the respondents.

### *Statistical Analysis*

The data collected were analyzed using SPSS version 22, with multiple statistical techniques employed to examine the relationships between smartphone usage patterns and academic performance.

To determine the effect of students' academic year and field of specialization on academic performance, an ANOVA was conducted. This analysis was aimed at identifying any statistically significant differences in GPA based on students' level of study or academic discipline. The results indicated a significant effect of academic year on performance ( $p = 0.0036$ ), suggesting that academic maturity may influence students' ability to manage smartphone-related distractions. However, no significant differences were found across fields of specialization, as indicated by  $p$ -values exceeding 0.05. To further explore differences between fields with potentially unequal variances, Welch's T-tests were applied to specific pairs of fields, such as Education Technology vs. Law. Welch's T-test was selected due to its suitability for groups with unequal variances, providing a more accurate measure in this context. The results showed no statistically significant differences in smartphone impact on academic performance across fields, as indicated by  $p$ -values above 0.05. Pearson correlation coefficients were calculated to assess the relationship between smartphone-related distraction behaviors and academic performance. The analysis revealed weak correlations, such as a coefficient of 0.0369 between their academic performance and the statement "I am often preoccupied with outside responsibilities," indicating minimal direct impact of distractions on academic outcomes. However, strong intercorrelations were observed among distraction-related behaviors (e.g., a correlation of 0.8607 between "mentally distracted" and "preoccupied with outside tasks"), suggesting that these behaviors are interrelated but do not significantly detract from academic performance.

Cronbach's alpha was calculated to confirm the internal consistency and reliability of the 13-item attitude scale. Pearson's correlation analysis was also conducted to assess levels of smartphone addiction, drawing on established scales, including the Smartphone Addiction Scale (SAS), Smartphone Addiction Proneness Scale (SAPS), and Knowledge Scale (KS). An area under the curve (AUC) score was used to evaluate the accuracy of a predictive model for smartphone addiction, with scores ranging from 0.7 to above 0.9, indicating the model's predictive accuracy from acceptable to outstanding. The optimal cut-off point on the ROC curve was selected to maximize sensitivity and specificity, further ensuring the reliability of results.

## **Results**

The ANOVA Table 1 shows that the  $p$ -value (year of study) was smaller than  $\alpha=0.05 = 0.0036$ . This result implies a statistically significant difference in students' academic performance by years of study. For the columns, the  $F$ -value is equal to 5.7787, which means that the variations in academic performance explained by the year of study are significantly greater than expected by chance. This suggests that years of study in their respective academic programs are important predictors of their performance, perhaps because of differences in study habits, interests, or course experience.

This finding directly supports the hypothesis: Smartphone usage affects academic performance in different years of study differently. Regarding distractions, thus, as classes continue through the years, students become better at pragmatic study habits and self-management that may decrease the negative effects of smartphone interference. For example, first-year students who presumably spend a lot of time on their smartphones for communications and leisure activities scored 4.17 on average (Row 2).

Smartphone Addiction	Sum of squares	df	Means	t Stat	p-value (two-tail)	F-statistic
Between groups (Education Technology vs Computer Science)	70.5	8	10.6 vs 6.2	1.1718	0.2750	1.00
Within groups	70.5	8				
Total	141	16				
Between groups (Education Technology vs Law)	37.8	4	10.6 vs 8.0	0.9456	0.3979	1.00
Within groups	37.8	4				
Total	75.6	8				
Between groups (Education Technology vs Other)	43.3	6	10.6 vs 5.0	1.9030	0.1057	1.00
Within groups	43.3	6				
Total	86.6	12				
Between groups (Computer Science vs Law)	18.5	4	6.2 vs 8.0	-0.6644	0.5428	1.00
Within groups	18.5	4				
Total	37	8				
Between groups (Computer Science vs Other)	21.1	6	6.2 vs 5.0	0.4131	0.6939	1.00
Within groups	21.1	6				
Total	42.2	12				
Between groups (Law vs Other)	15.5	6	8.0 vs 5.0	2.1764	0.0724	1.00
Within groups	15.5	6				
Total	31	12				

**Table 1. Smartphone Addiction**

In contrast, more pragmatic third-year students, more likely to use smartphones for academic purposes, received a higher score of 6.83 on average. This translates to poor performance differences due to the natural growth of study skills and the best way to maximize the use of technology toward performance.

Additionally, the between-group component, or sig strength col (sum of squares for columns = 349.2083; mean square for columns = 69.8417), argues that smartphone usage has varying effects on learners primarily due to their level of academic maturity. Eventually, time management skills will be enhanced, and students will likely devote most of their time to relevant classes rather than waste their time on malfunctions (See Table 2).

#### ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
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Rows	24.458	3	8.153	0.675	0.581	3.287
Columns	349.208	5	69.842	5.779	0.0036	2.901
Error	181.292	15	12.086			
Total	554.958	23				

Table 2. Anova

*Correlation Analysis*

Each correlation coefficient measures how strongly two variables are related, with values ranging from -1 (perfect negative correlation) to 1 (perfect positive correlation) and 0 indicating no correlation. Starting with the first analysis, there is a positive, albeit weak, correlation of 0.0369 between "I am often preoccupied with outside responsibilities or tasks during class" and GPA. This helps to suggest that the students who claim they are easily distracted by outside responsibilities do not feel they perform much worse in academia. Likewise, the second correlation of the statement: "In class, it appears as though I am on autopilot with minimal or little attention to what the professor is saying," correlation is 0.0761, with academic performance with a weak positive correlation. Based on the findings of this study call for a rethink where it has been perceived that non-involvement or disinterest leads to poor performance, particularly as probed by their self-rating.

In the third analysis, a weak relationship of 0.0103 exists between "My mind is rarely focused on what is going on in class" and academic performance. This finding emphasizes that a lack of focus during class does not significantly impact how students perceive their academic success.

The fourth analysis examines "I frequently find myself physically in class but mentally distracted, not fully paying attention," which results in a negative correlation of -0.0131 with academic performance. This weak negative correlation holds the understanding that students who physically attend but mentally are somewhere else do not indicate lower performance, emphasizing that simple physical presence equals learning or assessment of performance in a course.

When all the elements are combined, it is revealed that there is a moderate to very high correlation between the factors of attention and engagement. For instance, the correlation between "I frequently find myself physically in class but mentally distracted" and "I am often focused on outside responsibilities or tasks during class" is 0.8607, indicating a high positive relationship. Similarly, the correlations among self-reported attention levels show a strong interconnection, with values reaching up to 0.9104. Such findings imply that the disruptions students observe during classroom time are reliable and interrelated, thus manifesting a disengagement process.

Consequently, students identify a range of distractions and focus levels in class, and it can be concluded that these factors are not closely related to students' self-estimated academic performance. We cannot, therefore, reject the null hypothesis because Tables 2-6 indicate an insignificant influence on performance by correlations. This goes a long way to show that the learning and performance process in academics is multidimensional; thus, issues to do with student attention do not necessarily correspond with self-perceived effectiveness. Further investigation could elucidate whether other external factors, such as study habits or prior knowledge, play a more significant role in academic outcomes ( See Table 3).

Combined Correlation Analysis					
	<i>I frequently find myself physically in class but mentally distracted, not fully paying attention.</i>	<i>Please rate how well you feel you are performing academically so far in this course:</i>	<i>I am often focused on outside responsibilities or tasks during class.</i>	<i>In class, it seems as if I am running on autopilot without much attention to what the professor is saying</i>	<i>My mind is rarely focused on what is going on in class.</i>
I frequently find myself physically in class but mentally distracted, not fully paying attention.	1				
Please rate how well you feel you are performing academically so far in this course:	-0.01308	1			
I am often focused on outside responsibilities or tasks during class.	0.86072	0.03686	1		
In class, it seems as if I am running on autopilot without much attention to what the professor is saying	0.85147	0.07612	0.91676	1	
My mind is rarely focused on what is going on in class.	0.91037	0.01033	0.84838	0.89775	1

Table 3. Correlation Analysis

While the correlation analysis comments on the extent of the relationships between variables, the Welch t-tests give a more definite account of the variability of the differences in the means between the two independent groups when there is an assumption of inequality in variance. The findings show that the p-value is consistently insignificant compared to the other groups, suggesting the homogeneity of students' experiences and attitudes toward it. For example, there was no statistically significant correlation between the two studied variables, namely, confidence in the ability to apply the material in new circumstances and the ability to explain the material ( $t = 0.115$ ;  $p = 0.908$ ). Similarly, no significant difference emerged for comparison between feeling restless in class and struggling to relax,  $t = -0.162$ ,  $p = 0.871$  for feeling restless in class compared to struggling to relax. Furthermore, class-related worry, control over worrying ( $t = -0.377$ ,  $p = 0.706$ ), self-rated academic performance, and identifying confusion ( $t = 0.649$ ,  $p = 0.517$ ) exhibited comparable experience. Finally, the differences in nervousness and irritability between class ( $t = 0.894$ ,  $p = 0.373$ ) and post-class confusion of learning from struggles ( $t = -0.391$ ,  $p = 0.696$ ) also show that the present perceptions between these three feelings and thinking were similar (See table Table 4).

Test Pair	Variable 1	Variable 2	Mean 1	Mean 2	Variance 1	Variance 2	t Stat	p-Value (Two-Tail)	df
Welch T-Test 1	I feel like I can apply the knowledge I learn in my courses to new situations.	I feel confident explaining most of the concepts or principles learned in my courses to someone else.	3.563	3.544	1.464	1.466	0.115	0.908	204
Welch T-Test 2	During class, I am so restless that it's hard to sit still.	During class, I have trouble relaxing.	2.728	2.757	1.729	1.597	-0.162	0.871	204
Welch T-Test 3	I have developed new study strategies that have helped me learn the material.	I feel like I can apply what I learn in my courses to life outside of university.	3.505	3.544	1.547	1.564	-0.223	0.823	204
Welch T-Test 4	During class, I often worry too much about different things.	During class, I am not able to stop or control worrying.	2.748	2.816	1.661	1.681	-0.377	0.706	204
Welch T-Test 5	Please rate how well you feel you are performing academically so far in this course.	I feel like I am able to identify points of confusion.	3.612	3.495	1.691	1.625	0.649	0.517	204
Welch T-Test 6	Rate how often you feel nervous or anxious during academic activities, especially in classes.	During class, I become easily annoyed or irritable.	2.922	2.757	1.915	1.597	0.894	0.373	202
Welch T-Test 7	I often feel confused after class (reverse-coded).	I have been able to learn from my successes and struggles in my courses.	3.505	3.573	1.664	1.443	-0.391	0.696	203

Table 4. T-Test

In contrast, the earlier correlation analyses demonstrated strong interconnections among the attention-related statements, suggesting that while students might report varying degrees of distraction, these distractions do not significantly affect their self-perceived academic performance. The absence of significant t-test results may imply that factors such as confidence and ability to apply knowledge might be uniformly perceived across different levels of reported distractions.

The ANOVA test was not significant, and the results of the Welch t-tests are as follows: There were relatively substantial similarities in Academic Self-perceptions between classes and students; they do not overestimate or underestimate the amount of engagement implied by the percentage score ranges. Although correlation coefficients might equally point to the regularity of such patterns of distraction, their effect does not reduce how students perceive their academic performance as the t-test findings depict (see Table 5). Therefore, as with the Welch t-tests, no difference was observed between the pair of means regarding H3 since the p-values obtained are all above 0.05. This indicates no significant differences in academic performance measures across varying smartphone usage behaviors, suggesting smartphone use has minimal impact on performance perceptions.

t Stat	p-value (two-tail)	Smartphone Addiction
1.1718	0.2750	Between groups (Education Technology vs Computer Science)
0.9456	0.3979	Between groups (Education Technology vs Law)
1.9030	0.1057	Between groups (Education Technology vs Other)
-0.6644	0.5428	Between groups (Computer Science vs Law)
0.4131	0.6939	Between groups (Computer Science vs Other)
2.1764	0.0724	Between groups (Law vs Other)

**Table 5. t stat Smartphone Addiction**

The t-tests conducted to analyze Smartphone addiction influence on the course performance yielded on this aspect were also not statistically significant in fields of study. For example, the t-statistic for Education Technology against Computer Science was 1.1718, corresponding to a p-value of 0.2750, which makes the analyzed difference. On the same note, when comparing results with Law, we got a p-value of 0.3979, and other fields gave a p-value of 0.1057. Comparing Computer Science with Law: t-statistic was -0.6644, while the p-value was 0.5428; while comparing Law with Other, the t-statistic was 2.1764, and the p-value was 0.0724. These outcomes show that there is not much variation in the effect of smartphone usage with performance implications in the various disciplines analyzed. These discredit the assumed hypothesis.

The findings presented in the study point to several intricate relationships between the extent of smartphone use, attention, and academic outcomes. Even though the results of the ANOVA test show the difference in students' academic performance by the year of study is statistically significant,  $F(3, 82) = 3.60$ ,  $p = 0.0036$ , Welch t-test and correlation tests show that smartphone use has no significant effect on students perceived academic performance. The correlation analysis provides strong evidence that self-estimated distraction in students, social media during class, assignments, or work indicates that smartphones are multifunctional devices with academic, communication, game, and social media functions. Nonetheless, smartphone interruptions do not result in a negative influence on the student's academic self-perceptions. This implies that academic confidence may be quite robust to interruptions by smartphones.

## Discussion

This study set out to explore the influence of smartphone usage on academic performance among students at King Abdulaziz University, with a focus on differences based on academic year and field of specialization. The findings suggest a nuanced relationship between smartphone usage, academic maturity, and academic performance. Specifically, while smartphone usage, including behaviors indicative of addiction (e.g., compulsive checking and classroom use), was pervasive, it did not show a statistically significant direct impact on academic performance. Instead, the year of study emerged as a more substantial predictor of

academic performance, with upper-year students displaying stronger time management and self-regulation skills, which appear to mitigate the potential distractions of smartphone use.

These results are consistent with previous studies indicating that students' academic maturity and developed study habits play a role in managing smartphone-related distractions (e.g., Amez & Baert, 2020). As students progress in their academic journey, they likely refine their self-management strategies, making them less vulnerable to the distracting effects of smartphones in classroom settings. The lack of significant differences across fields of specialization further suggests that the influence of smartphone usage on academic performance is largely consistent across disciplines. This finding aligns with research indicating that smartphone usage patterns tend to be homogenous in their impact on students across various academic fields (e.g., Lepp et al., 2015).

The intercorrelations among attention-related behaviors, although not directly affecting academic outcomes, highlight an area worth further exploration. For instance, behaviors such as mentally disengaging in class or focusing on external responsibilities during class time were interrelated yet did not significantly detract from academic performance. This could indicate that academic performance may be less sensitive to short-term distractions and more influenced by broader study habits, motivation, and self-regulation skills developed over time.

## Conclusion

In conclusion, this study underscores the complexity of the relationship between smartphone usage and academic performance. While smartphones are prevalent among university students and serve both academic and non-academic purposes, their impact on academic outcomes appears moderated by students' maturity and self-regulation skills. Upper-year students demonstrated a stronger ability to manage smartphone-related distractions, suggesting that as students progress in their studies, they develop strategies that minimize the potential negative effects of smartphone use.

The findings of this study support the recommendation that universities should consider implementing digital literacy and self-management programs, particularly for first-year students, to enhance their ability to use smartphones as tools for academic success rather than sources of distraction. Future research could expand on these findings by examining longitudinal impacts of smartphone usage patterns on academic outcomes and exploring additional moderating factors, such as study habits, intrinsic motivation, and engagement with academic content.

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