

IMPACT OF SMARTPHONE ADDICTION ON OPTIMISM AND ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS

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ABSTRACT

This study examined the impact of smartphone use on students' academic performance and optimism. A self-administered questionnaire recruited 377 students aged 19 to 26 as participants. Sample size was calculated using the Raosoft sample size calculator, and standardized tools, including the Smartphone Addiction Scale (SAS), the Life Orientation Test-Revised (LOT-R), and self-reported Grade Point Average (GPA), were used to assess smartphone use, optimism, and academic performance, respectively. A quantitative, cross-sectional design was used. Gender differences were assessed with independent t-tests. Multivariate regression analysis indicated that smartphone use had a substantial negative effect on both optimism and academic performance. Female students reported significantly more smartphone use and lower optimism scores than male students. These findings underscore the need for digital literacy, appropriate smartphone use, and institutional initiatives to improve students' well-being. Potential measures include developing university-level policies, instructional seminars, and intervention programs to mitigate the detrimental effects of excessive smartphone use. To better understand the mechanisms at work, future studies should focus on mediating factors such as self-regulation and mental well-being.

KEYWORDS

CGPA, Digital Era, Pakistani Students, Self Determination, Technology

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I. INTRODUCTION

The digital era is one in which everything is digital, and technology is so integrated into daily life that you communicate, work, and, in certain cases, learn using it (Singh, 2021). There have been many technological advancements in recent years, but none are as widely used and versatile as cell phones (Banik et al., 2021). Smartphones were primarily developed for communication, but they have since expanded to incorporate online browsing, social media interaction, entertainment, and productivity capabilities (Fortunati, 2022). As a result, digital natives, or students who have grown up with cell phones and can use them for everything from term paper research to social networking, are almost always online. Smartphones have become synonymous with university life due to their ubiquitous use for social networking, online access to instructional resources, and personal calendar management (Elhai et al., 2025). However, the reliance on smartphones creates some concerns. Smartphones can be useful productivity tools, but they can also be a source of distraction and lead to procrastination, which reduces academic performance (Agostini & Petrucco, 2023). Examining smartphone use among undergraduate students is critical for understanding its impact on academic achievement and psychological well-being (Huey & Giguere, 2022). Smartphones, on the other hand, can help learners learn more effectively by offering access to instructional content,

collaborative platforms, and time management apps (Jeong, 2022). Nevertheless, utilizing too much might lead to distraction, procrastination, and poor academic achievement. Furthermore, the psychological consequences of smartphone use (especially its impact on optimism and mental health) must be investigated. Most experts define optimism as a broad belief in optimistic future outcomes, which is important in how students cope with academic stress and issues.

According to the compensatory internet use idea (Kardefelt-Winther, 2014), a few hours of social media use can make up for less severe unpleasant sentiments, but this has some detrimental consequences. As a result, by lowering their negative emotions, optimistic people are less likely to be labelled as high-risk. Second, optimism can boost self-control (Oriol et al., 2020), and as a positive emotion, it can counteract the ego-depleting effect. This protects individuals from becoming addicted to social media. Third, research has found that optimists work more in interpersonal relationships, are easier to like, and gain greater social support from their surroundings (Liu et al., 2022). According to the interpersonal model of addiction relapse (Leach & Kranzler, 2013), a positive interpersonal interaction helps people recover from social media addictions. As a result, optimistic people with strong interpersonal relationships may be more likely to be labelled as low risk. According to Bandura's triadic reciprocal determinism hypothesis, personal and environmental factors determine conduct. In the current study, optimism and its favorable results (such as improved academic achievement and less smartphone use) can be characterized as personal and environmental factors, respectively. They may also successfully lessen the severity of social media addiction and the likelihood of being categorized as high-risk (Yue et al., 2025).

While several studies have been undertaken on the impact of smartphone usage on academic achievement, the impact of smartphone usage on optimism is not fully understood (Jo & Shin, 2024). Optimism is a positive psychological construct that improves students' capacity to deal with stress and stay motivated in challenging academic situations. Some studies have established a link between smartphone use and lower academic performance, while others have looked at how it affects students' optimism and psychological well-being (Joshi et al., 2023). According to the Social Comparison Theory, people evaluate themselves by comparing their skills, accomplishments, and circumstances to those of others. This can have a big impact on their academic achievement, confidence, and sense of self. Opportunities for these comparisons have risen with the proliferation of cell phones, particularly through social media, which frequently exacerbates social comparison inclinations (Nisara et al., 2019). This form of comparison, in which people regard others as superior in some way, can harm positive psychological development and self-esteem. People, particularly on social media, show themselves in an idealized light, encouraging upward comparison and its harmful consequences (Yang, 2016). The impacts of smartphone use, however, differ and can be mitigated by how people use their devices—whether for entertainment or academic purposes—as well as by their personal coping mechanisms, such as optimism.

A psychological concept known as behaviourism explains how environmental stimuli influence human behaviour. According to this idea, learners pick up behaviours from their experiences in the environment, and they can be changed by rewarding or punishing them (Haig, 2023). According to this concept, the use of touchscreen phones is an acquired behaviour that is influenced by external variables such as peer pressure, social norms, and technological convenience (Tk & Ali, 2024). The benefits that smartphones provide, such as instant gratification from games, entertainment, and social media approval, gradually encourage you to use them. Students who receive this kind of reward are more likely to use their smartphones often, forming a daily routine. Because cell phones are always available and promote interaction, this leads to a vicious loop of behaviour in which students continue to use their gadgets to the point that they may not even be aware of how they are impairing their ability to concentrate and be productive in class. When examining smartphone use from a behaviourist standpoint, it becomes clear that social beliefs and peer pressure are two external environmental elements that significantly influence how frequently students use their devices (Nawaz, 2024). According to the Self-Determination Theory (SDT), intrinsic motivation and high human performance are dependent on three basic psychological needs: autonomy, competence, and relatedness. Smartphone use has the potential to improve or undermine academic success and optimism. Smartphone use may increase intrinsic motivation, leading to improved academic achievement and optimism if it promotes autonomy, competence, and relatedness. However, excessive or distracted use may impair these demands, resulting in lower optimism, motivation, and grades (Akuratiya, 2024).

A mobile-integrated learning revolution in education has begun among students who own mobile devices, changing how they interact with learning material, communicate with peers or professors, and organize their academic duties via their smartphones (Szymkowiak et al., 2021). Although cell phones can help students with their academics by providing convenient access to vital academic resources and improving teamwork, there are concerns about students becoming distracted, which can negatively affect their academic performance. Long-term use of social media, gaming, and entertainment apps results in diminished focus, fewer study hours, and lower grades. This review further studies the link between smartphone use and optimism as well as academic performance. As a psychological trait, optimism can be directly related to how students will cope with academic pressures and setbacks. According to previous studies, excessive smartphone use, particularly in terms of social media consumption, has the potential to lower optimism by making a person feel inadequate and increasing stress levels (Zhang et al., 2025). This chapter introduces important insights regarding the dual nature of smartphone use through existing research on these topics, including the benefits and the negative outcomes of smartphone use to undergraduate students.

According to Ali and Warraich (2021), smartphones are widely used by university students and are essential tools for both personal and academic purposes. Great, cell phones can significantly improve the learning experience with these easily accessible information sources, educational apps, online resources, and communication platforms. Nevertheless, the numerous ways in which smartphones are used by students bring into question their possible negative side effects in relation to academic performance (Lin et al., 2021). Although smartphones aid academic purposes, unrestricted use and overindulgence have always led to distractions and procrastination, as well as reduced study time. Constant access to social media can also put students under pressure and stress and make them feel inadequate, as they might compare themselves to other students or to unrealistic online personas. These distractions can greatly impede academic performance and the ability to focus cognitively.

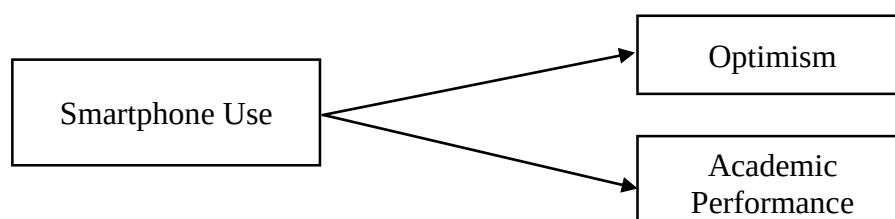
Objectives

1. To examine the impact of smartphone usage on optimism and academic performance of university students.
2. To identify gender differences in smartphone usage, optimism, and academic performance among university students.

Hypotheses

1. Smartphone usage will negatively predict both optimism and academic performance of university students.
2. There will be significant gender differences in smartphone usage and optimism among undergraduate students.

Conceptual Framework



II. METHOD

Sampling

This study is based on a quantitative, cross-sectional research design. The sample, calculated on the sample size calculator, showed 377 students enrolled in the universities of Abbottabad. The age range of the sample was between 19 and 26 years. Upon expression of interest, participants were presented with an informed consent form outlining the study objectives, procedures, and their rights as participants. Data collection was carried out in accordance with ethical guidelines, ensuring the privacy and confidentiality of participant responses.

Measures

Age, gender, semester, CGPA, and area of living were included as demographic variables in the study. **[1]** Smart Phone Use. A popular self-report tool for assessing the extent of problematic smartphone use is the Smartphone Addiction Scale (SAS), developed by Kwon et al. (2013). It includes 10 items that cover aspects including tolerance, withdrawal, and daily-life disruption. The items are assessed on a 6-point Likert scale that goes from strongly disagree to strongly agree. **[2]** Optimism. The 10-item (four fillers) Life Orientation Test-Revised (LOT-R), developed by Scheier et al. (1994), assesses individual variances in generalised optimism against pessimism. The items measure how much people expect favourable versus negative results and are assessed on a 5-point Likert scale. **[3]** Academic Performance. When official records are unavailable, academic performance is operationalised in this study using a single-item self-report measure in which students offer their most recent Grade Point Average (GPA) or percentage score. This approach is frequently employed in educational research.

Procedure

Formal permissions were secured via email from the respective authors to utilize the validated scales. Participants were recruited using a non-probability convenient sampling technique. Data collection utilized a cross-sectional design, gathering responses through physical questionnaires. Before completing the survey, all respondents were provided with clear instructions detailing the study's purpose, their right to voluntary participation, and data confidentiality. No administrative time limits were imposed, allowing participants to complete the questionnaires at their own pace to minimize response fatigue and ensure data quality. After the data collection, data was cleaned as incomplete and pattern wise filled questionnaires were discarded. Lastly, data was analysed by using SPSS version 30. Along with the head of the institutes, ethical permission was obtained from the Department of Psychology's Ethical Review Board of different universities from where participants were recruited. Additionally, the participants were asked for their informed consent, and their privacy and confidentiality were carefully addressed.

III. RESULTS

Table I: Demographic Characteristics of Study Participants

Variable	n	%
Gender		
Female	213	56.3
Male	164	43.4
Age		
19–22	257	68.0
23–26	120	31.7
Current semester		
2nd semester	77	20.4
3rd semester	23	6.1
4th semester	62	16.4
5th semester	23	6.1
6th semester	60	15.9
7th semester	35	9.3
8th semester	97	25.7
Area of living		
Abbottabad	257	68.2
Havelian	120	31.8

The psychometric properties of were assessed in table 1. All measures exhibited satisfactory internal consistency with an α of greater than 0.70 in all measures used in the study.

Table II: Psychometric Properties of Study Variables

Variables	M	SD	Range	Cronbach's α
1. Smartphone Usage	41.5	15.2	10-60	.93
2. Life orientation test revised	24.4	8.38	12-50	.77

Table 2 presents the psychometric properties of the scales used in the present study. The Smartphone Addiction Scale showed a mean score of 41.5 (SD = 15.2), with scores ranging from 10 to 60. The Cronbach's alpha for this scale was .93, indicating excellent internal consistency reliability ($\alpha > .90$). The Life Orientation Test-Revised yielded a mean score of 24.4 (SD = 8.38), with scores ranging from 12 to 50. The Cronbach's alpha for this scale was .77, which indicates acceptable internal consistency reliability ($\alpha > .70$). These results suggest that both instruments used in the study are psychometrically sound and reliable for assessing the respective constructs.

Table III: Multivariate Regression Showing Smartphone Usage as A Predictor of Optimism and Academic Performance among University Students

Outcome Variables	Predictors	B	β	R	R ²	ΔR^2	F	p
Optimism	Smartphone Usage	-.14	-.26	.26	.068	.065	27.21	.00
Academic Performance	Smartphone Usage	-.01	-.35	.35	.123	.121	52.31	.00

Note. B = unstandardized regression coefficient; β = standardized regression coefficient; R = multiple correlation coefficient; R² = coefficient of determination. ΔR^2 adjusts for sample size (N = 375). Both models include a single predictor (Smartphone Usage).

Multivariate regression analyses were conducted to examine whether smartphone addiction predicted optimism and academic performance. Smartphone addiction significantly predicted optimism, $\beta = -.26$, $R^2 = .068$, $F(1, 373) = 27.21$, $p < .001$, indicating that higher levels of smartphone usage were associated with lower levels of optimism. Smartphone usage also significantly predicted academic performance, $\beta = -.35$, $R^2 = .123$, $F(1, 373) = 52.31$, $p < .001$, suggesting that increased smartphone usage was associated with lower CGPA.

Table IV: Gender Differences in Smartphone Usage and Optimism

Variables	Male (n = 164)		Female (n = 213)		t(375)	p	Cohen's d
	M	SD	M	SD			
SAS	39.34	16.50	43.28	14.05	-2.50	.00	0.26
LOTS	24.99	9.21	24.08	7.68	1.04	.01	0.11

Note. SAS = Smartphone Addiction Scale, LOTS = Life Orientation Test Revised Scale

Table 4 presents the results of an independent samples t-test conducted to examine gender differences in smartphone addiction and life orientation. The results indicated a statistically significant difference in smartphone addiction scores between males (M = 39.34, SD = 16.50) and females (M = 43.28, SD = 14.05), $t(375) = -2.50$, $p < .001$, with females scoring higher. The effect size, Cohen's $d = -0.26$, suggests a small effect. In contrast, no significant gender difference was found for life orientation scores, $t(375) = 1.04$, $p = .01$, with males (M = 24.99, SD = 9.21) and females (M = 24.08, SD = 7.68) showing similar levels of life orientation. The effect size for this comparison was also small (Cohen's $d = 0.11$), indicating a minimal practical difference.

IV.DISCUSSION

The study participants' demographic profile (N = 377) provides crucial background information for analysing the research results. There are more female participants (n = 213, 56.3%) than male participants (n = 164, 43.4%), according to the gender distribution. The way that gender-related factors affect the study's findings may be affected by this imbalance, which might also reflect overall enrolment patterns in the school or field of study. The participants were spread over all semesters in terms of academic status, with the largest group falling into the eighth semester (n = 97, 25.7%), followed by the second semester (n = 77, 20.4%), and the fourth semester (n = 62, 16.4%), while the other semesters had moderate to low representation. Students in later phases of their academic programs are given

a higher weight in this distribution, which may indicate that the participants are more seasoned or academically mature. Both the Life Orientation Test-Revised and the Smartphone Addiction Scale are valid instruments for evaluating the constructs being studied, according to the psychometric analysis of the instruments employed in this study. Excellent internal consistency reliability ($\alpha > .90$) was indicated by the Smartphone Addiction Scale's high Cronbach's alpha coefficient of .93. This implies that the scale's items are quite reliable in assessing university students' smartphone addiction. Similarly, the Life Orientation Test-Revised showed strong internal consistency reliability with a Cronbach's alpha of .77, falling inside the acceptable range ($\alpha > .70$). The construct of optimism or life orientation is measured consistently and reliably throughout the sample thanks to this scale's acceptable reliability. A wide range of smartphone usage levels among participants was shown by the mean score for smartphone addiction, which was 41.5 (SD = 15.2), with values ranging from 10 to 60. Students' various levels of optimism were reflected in their life orientation ratings, which ranged from 12 to 50 with a mean of 24.4 (SD = 8.38).

By using linear regression analysis, it was found that there was a noteworthy inverse prediction effect of smartphone use on both optimism and academic performance and indicating that higher smartphone use is linked to decreased optimism and academic performance. This supports other studies that show excessive smartphone use, particularly for non-academic uses like social media or entertainment, can result in psychological problems like lower motivation, elevated anxiety, and a decline in positive thinking, all of which can erode a person's optimistic outlook (Zhu et al., 2025). The findings also suggest that students with more smartphone usage had poorer CGPAs, perhaps because of increased distractions from schoolwork, less time spent studying, and irregular sleep schedules. Findings are also consistent with earlier research that suggests excessive smartphone use, particularly for non-academic activities like social media and entertainment, can lead to procrastination, decreased concentration, and less study time, all of which can impede academic success (Lin et al., 2021; Elhai et al., 2025). Additionally, the findings of an independent samples t-test showed that the scores of male and female students on the smartphone addiction scale differed significantly, as the p-value was less than .001. Female students reported substantially greater levels of smartphone addiction than male students. The findings are consistent with earlier research indicating that women may be more likely to use smartphones excessively, perhaps because of their increased usage of social media, communication, and emotional dependence on digital connectivity (Banik et al., 2021). Females' rising use of smartphones may have an impact on their academic performance and mental health, which is a trend that needs more research. As the p-value was statistically significant, significant gender differences were recorded in the life orientation ratings. In contrast to smartphone usage, males scored significantly higher than females, which indirectly proves the prediction effect of smartphone usage on optimism, too. Like, females scored significantly higher on smartphone usage, and they simultaneously scored lower on optimism than males. These outcomes are in line with previous research indicating that females are more likely to engage in frequent smartphone use for social interaction, emotional support, and maintaining peer relationships (Chen et al., 2017). Overall, the results show how excessive smartphone use can negatively impact academic performance (lower CGPA) and emotional well-being (lower optimism). This highlights the need for awareness campaigns, digital well-being strategies, and advice on healthier smartphone usage among undergraduate students.

Implications, Limitations and Suggestions

Universities can create guidelines that control smartphone use in class, like establishing areas where phones are not allowed or putting app blocks in place while students are studying. To help students manage their academic workload and lessen the possible detrimental effects of smartphone use on academic performance, universities should provide academic support services, including tutoring, mentorship, and study skills courses. Teachers and parents should collaborate to create methods to support students by being informed about the possible impacts of smartphone use on students' academic performance and optimism. In addition to developing evidence-based interventions to encourage healthy smartphone usage habits, more research can be done to examine the association between smartphone use, optimism, and academic success in various contexts and demographics. The study used self-reported metrics for academic success, optimism, and smartphone use, all of which could be biased. The study may not be representative of all university students because it is only being undertaken at one university. Although the study concentrates on smartphone use, optimism, and academic achievement, it might not examine other variables like motivation, personality traits, or learning styles that might have an impact on these associations.

V. CONCLUSION

The current study investigated the impact of smartphone usage on university students' academic achievement and optimism. The results demonstrate the psychological and academic costs, showing that excessive smartphone use is strongly linked to both decreased optimism and poorer academic achievement. Social Comparison Theory states that students' optimism and self-esteem may be weakened by upward comparisons prompted by their continuous exposure to idealized content on social media. Overall, by demonstrating the dual effects of smartphone use—as a useful academic tool when used moderately, but as a possible risk to psychological health and academic accomplishment when used excessively—this study adds to the expanding body of research on digital behaviour and student well-being. Additionally, the study validates the validity of its findings by confirming the reliability of the Life Orientation Test-Revised and Smartphone Addiction Scale in the specified environment. Universities, educators, and mental health experts must foster digital mindfulness, support appropriate smartphone usage habits, and develop awareness campaigns considering these findings to lessen the harmful effects of smartphone addiction. To better understand the relationships between psychological well-being and academic success in the digital age, future studies should consider a wider range of factors, including motivation, coping mechanisms, and personality

VI. REFERENCES

- Agostini, D., & Petrucco, C. (2023). Problematic Smartphone Use and University Students' Academic Performance. *Journal of E-Learning and Knowledge Society*, 19(2), 30–38. <https://doi.org/10.20368/1971-8829/1135747>
- Akuratiya, D. A. (2024). Impact of Smartphone Usage on Academic Performance: A Study on Higher Education Students. *International Journal of Research and Innovation in Social Science*, VIII(III), 43–51. <https://doi.org/10.47772/ijriss.2024.803004s>
- Ali, I., & Warraich, N. F. (2021). Personal information management through ubiquitous devices: Students' mobile self-efficacy and PIM practices. *Journal of Librarianship and Information Science*, 096100062199282. <https://doi.org/10.1177/0961000621992821>
- Banik, S., Melanthota, S. K., Arbaaz, Vaz, J. M., Kadambalithaya, V. M., Hussain, I., Dutta, S., & Mazumder, N. (2021). Recent trends in smartphone-based detection for biomedical applications: a review. *Analytical and Bioanalytical Chemistry*, 413(9), 2389–2406. <https://doi.org/10.1007/s00216-021-03184-z>
- Elhai, J. D., Casale, S., & Montag, C. (2025). Worry and fear of missing out are associated with problematic smartphone and social media use severity. *Journal of Affective Disorders*, 379, 258–265. <https://doi.org/10.1016/j.jad.2025.03.062>
- Fortunati, L. (2022). The Smartphone between the Present and the future: Five Changes. *Mobile Media & Communication*, 11(1), 205015792211312. <https://doi.org/10.1177/20501579221131223>
- Haig, B. D. (2023). Realism, Behaviourism, and Psychological Theory. *Psychological Inquiry*, 34(4), 261–266. <https://doi.org/10.1080/1047840x.2023.2274376>
- Huey, M., & Giguere, D. (2022). The Impact of Smartphone Use on Course Comprehension and Psychological Well-Being in the College Classroom. *Innovative Higher Education*, 48(3). <https://doi.org/10.1007/s10755-022-09638-1>
- Jeong, K.-O. (2022). Facilitating Sustainable Self-Directed Learning Experience with the Use of Mobile-Assisted Language Learning. *Sustainability*, 14(5), 2894. <https://doi.org/10.3390/su14052894>
- Jo, H., & Shin, D. (2024). Influence of social and psychological factors on smartphone usage during the COVID-19 pandemic. *Digital Health*, 10. <https://doi.org/10.1177/20552076241298482>
- Joshi, S. C., Woltering, S., & Woodward, J. (2023). Cell Phone Social Media Use and Psychological Well-Being in Young Adults: Implications for Internet-Related Disorders. *International Journal of Environmental Research and Public Health*, 20(2), 1197. <https://doi.org/10.3390/ijerph20021197>
- Kardefelt-Winther, D. (2014). A Conceptual and Methodological Critique of Internet Addiction research: Towards a Model of Compensatory Internet Use. *Computers in Human Behavior*, 31(1), 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>

- Kwon, M., Kim, D.-J., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents. *PLoS ONE*, 8(12), e83558. <https://doi.org/10.1371/journal.pone.0083558>
- Leach, D., & Kranzler, H. R. (2013). An Interpersonal Model of Addiction Relapse. *Addictive Disorders & Their Treatment*, 12(4), 183–192. <https://doi.org/10.1097/adt.0b013e31826ac408>
- Lin, Y., Liu, Y., Fan, W., Tuunainen, V. K., & Deng, S. (2021). Revisiting the relationship between smartphone use and academic performance: A large-scale study. *Computers in Human Behaviour*, 122(106835), 106835. <https://doi.org/10.1016/j.chb.2021.106835>
- Liu, C., Luo, D., Zhou, Y., Zhang, G., Feng, X., Wang, Z., Chen, J., & Bi, Q. (2022). Optimism and subjective well-being in nursing home older adults: The mediating roles of gratitude and social support. *Geriatric Nursing*, 47, 232–238. <https://doi.org/10.1016/j.gerinurse.2022.07.020>
- Liu, F., Xu, Y., Yang, T., Li, Z., Dong, Y., Chen, L., & Sun, X. (2022). The Mediating Roles of Time Management and Learning Strategic Approach in the Relationship Between Smartphone Addiction and Academic Procrastination. *Psychology Research and Behaviour Management*, Volume 15, 2639–2648. <https://doi.org/10.2147/prbm.s373095>
- Nawaz, S. (2024). Distinguishing Between Effectual, Ineffectual, and Problematic Smartphone Use: A Comprehensive Review and Conceptual Pathways Model for Future Research. *Computers in Human Behaviour Reports*, 100424–100424. <https://doi.org/10.1016/j.chbr.2024.100424>
- Nisar, T. M., Prabhakar, G., Ilavarasan, P. V., & Baabdullah, A. M. (2019). Facebook usage and mental health: An empirical study of role of non-directional social comparisons in the UK [Review of Facebook usage and mental health: An empirical study of role of non-directional social comparisons in the UK]. *International Journal of Information Management*, 48, 53–62. <https://doi.org/10.1016/j.ijinfomgt.2019.01.017>
- Oriol, X., Miranda, R., Bazán, C., & Benavente, E. (2020). Distinct Routes to Understand the Relationship Between Dispositional Optimism and Life Satisfaction: Self-Control and Grit, Positive Affect, Gratitude, and Meaning in Life. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.00907>
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67(6), 1063–1078. <https://doi.org/10.1037/0022-3514.67.6.1063>
- SHIBAHATHULLA TK, & ALI. (2024, September 17). Factors Influencing Consumer Adoption of On-Demand Social Media Platforms. <https://doi.org/10.21203/rs.3.rs-5101050/v1>
- Singh, M. N. (2021). Inroad of Digital Technology in Education: Age of Digital Classroom. *Higher Education for the Future*, 8(1), 20–30. <https://doi.org/10.1177/2347631120980272>
- Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society*, 65(65). <https://www.sciencedirect.com/science/article/abs/pii/S0160791X21000403>
- Yang, C. (2016). Instagram Use, Loneliness, and Social Comparison Orientation: Interact and Browse on Social Media, But Don't Compare. *Cyberpsychology, Behavior, and Social Networking*, 19(12), 703–708. <https://doi.org/10.1089/cyber.2016.0201>
- Yang, S.-Y., Chen, M.-De, Huang, Y.-C., Lin, C.-Y., & Chang, J.-H. (2016). Association Between Smartphone Use and Musculoskeletal Discomfort in Adolescent Students. *Journal of Community Health*, 42(3), 423–430. <https://doi.org/10.1007/s10900-016-0271-x>
- Yue, H., Gao, S., Huang, Y., & Zhang, X. (2025). The associations between optimism, personal growth initiative and the latent classes of social media addiction. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1429101>
- Zhang, P., Wang, M., Ding, L., Liu, J., Yuan, Y., Zhang, J., Feng, S., & Liu, Y. (2025). The Effect of Self-Esteem on Mobile Phone Addiction Among College Students: Sequential Mediating Effects of Online Upward Social Comparison and Social Anxiety. *Psychology Research and Behavior Management*, Volume 18, 657–669. <https://doi.org/10.2147/prbm.s508668>
- Zhu, W., Zhang, Y., Lan, Y., & Song, X. (2025). Smartphone dependence and its influence on physical and mental health. *Frontiers in Psychiatry*, 16. <https://doi.org/10.3389/fpsyg.2025.1281841>