The Association Between Smartphone Addiction, Learning Motivation Levels, and Cumulative Grade Point Average Among Students at the Faculty of Medicine, Pelita Harapan University

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Abstract

Background: Cumulative Grade Point Average (CGPA) is a crucial metric in higher education. Achieving a good CGPA increases students' opportunities for career advancement or further education. Smartphones can aid learning by boosting motivation and academic achievement but may also cause addiction when used primarily for entertainment.

Objective: To examine the relationship between smartphone addiction, learning motivation levels, and CGPA among preclinical students at the Faculty of Medicine, Pelita Harapan University.

Methodology: This cross-sectional analytical study involved 103 students with a minimum sample size of 95. Data were analyzed using SPSS version 23 through bivariate analysis.

Results: Among the respondents, 70 students were addicted to smartphone use, 94 achieved satisfactory CGPA scores, and 65 had high learning motivation. A significant relationship was found between smartphone addiction and CGPA (p = 0.029), smartphone addiction and learning motivation (p = 0.013), and learning motivation with CGPA (p = 0.000).

Conclusion: There is a significant association between smartphone addiction, learning motivation levels, and CGPA among students at the Faculty of Medicine, Pelita Harapan University.

Introduction

The cumulative grade point average (GPA) serves as a pivotal academic indicator within higher education, signifying students' proficiency and understanding of course content. Achieving a high GPA is not only critical for meeting graduation requirements but also plays a significant role in shaping career prospects and access to advanced educational pursuits.[1] As stipulated in Indonesia's Ministry of Education and Culture Regulation No. 3 of 2020 concerning Higher Education

Standards, a cumulative GPA of 3.00 or higher is deemed satisfactory, whereas a minimum GPA of 2.00 is required for the completion of an undergraduate degree.[2]

The cumulative GPA is shaped by internal factors, including intellectual capacity, attitudes towards learning, and the effectiveness of study methods employed by students,[3] as well as external factors, including the learning environment, educator quality, campus infrastructure, and parental support.[4,5] Learning motivation plays a critical role in determining students' GPA. A study conducted among nursing students at Sam Ratulangi University revealed a positive correlation between learning motivation and academic achievement, indicating that students with higher levels of motivation tend to achieve superior GPAs.[6]

Smartphones have emerged as essential academic tools, empowering students to perform a variety of educational tasks such as taking notes, creating presentations, and participating in online lectures.[7,8] When utilized effectively, smartphones can contribute to academic success. A study conducted in South Korea demonstrated that students who were proficient in smartphone-based communication tended to achieve higher GPAs.[9] However, excessive smartphone use for entertainment, such as watching videos, playing games, and social media, can lead to addiction, diminishing motivation and negatively affecting GPA.[10,11,12] Research has identified a negative correlation between smartphone addiction and GPA among adolescents. Nevertheless, the presence of contradictory findings, coupled with the 73% prevalence of moderate smartphone addiction reported among adolescents in South Tangerang, underscores the necessity for further investigation into this complex relationship.[13]

This study aims to examine the relationship between smartphone addiction, learning motivation, and GPA among preclinical students at the Faculty of Medicine, Universitas Pelita Harapan, offering insights into how smartphone addiction impacts learning motivation and academic performance.

Material And Methods

This study utilized a cross-sectional design, incorporating a categorical, unpaired comparative analytic approach to examine the relationship between smartphone addiction, learning motivation, and academic performance among students. The research was carried out over a period from August 2023 to June 2024.

The target population consisted of pre-clinical students from the 2021–2023 cohorts, who were selected through purposive sampling based on predefined inclusion criteria. These criteria included providing informed consent and meeting attendance requirements. Students who

did not provide informed consent or failed to meet the attendance criteria were excluded from the study.

Primary data were gathered using two validated instruments: the Smartphone Addiction Scale – Short Version (SAS-SV) and the motivation section of the Motivated Strategies for Learning Questionnaire (MSLQ), both of which were administered electronically. Secondary data, including attendance records and GPAs, were extracted from the university's administrative database. Data analysis was performed using Microsoft Excel 365 v2309 and SPSS 26, with the Chi-square continuity correction test applied as the primary statistical method. In cases where this test was not applicable, alternative methods such as Fisher's Exact test or Pearson's test were employed.

The questionnaires used in the study had been previously validated in scientific literature to ensure the reliability and validity of the data collected. Ethical oversight was provided by the Ethics Committee of the Faculty of Medicine at Universitas Pelita Harapan, with ethical approval granted under number 189/K-LKJ/ETIK/V/2024. Limitations of the study included the potential for response bias in questionnaire answers and the restriction of the sample to students from a single educational institution, which may limit the generalizability of the findings.

Result

Sampling was performed online using a cross-sectional questionnaire design. From a total of 110 respondents representing the 2021, 2022, and 2023 cohorts, 103 participants satisfied the inclusion criteria and did not meet any exclusion criteria. However, seven respondents were excluded for fulfilling the exclusion criteria. The diagram below illustrates the population selection process.

Table 1. Demographic Data of Study Respondents

Characteristic	n	%
Gender		
Male	31	30.10
Female	72	69.90
Cohort		
2021	35	33.98
2022	31	30.10
2023	37	35.92
Total Respondents	**103**	**100**

The distribution of respondents across cohorts revealed that the highest number of participants belonged to the 2023 cohort, with 37 individuals (35.92%). This was followed by the 2021 cohort, which comprised 35 individuals (33.98%), while the 2022 cohort had the smallest representation, with 31 individuals (30.10%).

Table 2. Respondent Characteristics Data

Characteristic	n	%
Smartphone Addiction		
Yes	70	67,96
No	33	32,04
Cumulative Achievement Index (GPA)		
Satisfactory (≥ 2.75)	94	91,26
Unsatisfactory (< 2.75)	9	8,74
Learning Motivation Level		
High	65	63,11
Medium	36	34,95
Low	2	1,94
Total Respondents	**103**	**100**

Smartphone addiction was assessed using the SAS-SV and categorized according to Arthy's distribution. The findings revealed that the majority of respondents, 70 individuals (67.96%), exhibited signs of addiction, while 33 respondents (32.04%) did not. In terms of grade point average (GPA), 94 respondents (91.26%) achieved satisfactory scores, whereas 9 respondents (8.74%) had unsatisfactory scores. Ask Explain

The learning motivation level, measured by the MSLQ and categorized according to Lisiswanti's distribution,[15] revealed that 65 respondents (63.11%) had high motivation, 36 respondents (34.95%) had medium motivation, and 2 respondents (1.94%) had low motivation.

The relationship between smartphone addiction and learning motivation was examined using the bivariate Pearson's Chi-Square test, applied to a 3x2 contingency table to determine the p-value.

Table 3. Pearson's Chi-Square Test

Variable	Learning Motivation Level			Total	*p-value*
	High	Medium	Low		
Smartphone Addiction					
Yes	50 (71,4%)	18 (25,7%)	2 (2,9%)	70	0,013
No	15 (45,5%)	18 (54,5%)	0 (0%)	33	

As shown in Table 5.3, the majority of preclinical students at the Faculty of Medicine, Universitas Pelita Harapan, exhibited smartphone addiction (70 students), with 50 of these students (71.4%) demonstrating high motivation to learn. The relationship test yielded a p-value of 0.013, indicating a statistically significant association. To further assess the strength of this relationship, an additional bivariate analysis was performed by categorizing motivation levels into two groups: "Low-Medium" and "High." The degree of association between the variables was then quantified using the Odds Ratio.

Table 4. Odds Ratio Between Smartphone Addiction and Learning Motivation

Variable	Learning Motivation Level		Total	*Odds Ratio* (95% CI)
	High	Medium-Low		
Smartphone Addiction				
Yes	50 (71,4%)	20 (28,6%)	70	3,0 (1,27 -7,085)
No	15 (45,5%)	18 (54,5%)	33	

Table 5. Fisher's Exact Chi-Square Test for GPA Values.

Cumulative GPA Variable	Satisfactory	Unsatisfactory	Total	*p-value*
Smartphone Addiction				
Yes	67 (95,7%)	3 (4,3%)	70	0,029
No	27	6	33	

Table 6. *Odds Ratio Between Smartphone Addiction and GPA*

Variable	Cumulative GPA		Total	*Odds Ratio* (95% CI)
	Satisfactory	Unsatisfactory		
Smartphone Addiction				
Yes	67 (95,7%)	3 (4,3%)	70	4,963 (1,157 – 21,288)
No	27 (81,8%)	6 (18,2%)	33	

From Table 5.4 above, it is found that the Odds Ratio value is greater than 1, which is 4.963 (95% CI = 1.157 – 21.288).

To determine the relationship between the level of learning motivation and the GPA among preclinical medical students at

Universitas Pelita Harapan, a bivariate analysis was conducted using the Chi-Square test with Pearson's Chi-Square method to obtain the p-value, as the table was in a 2x3 format.

Table 7. Pearson's Chi-Square Test

Variable	Cumulative GPA		Total	*p-value*
	Satisfactory	Unsatisfactory		
Level of Motivation				
High	64 (98,5%)	1 (1,5%)	65	
Moderate	30 (83,3%)	6 (16,7%)	36	0,000
Low	0 (0%)	2 (100%)	2	

Based on Table 5.7, the majority of preclinical students at the Faculty of Medicine, Universitas Pelita Harapan, demonstrated a high level of motivation (65 students), with 64 of these students (98.5%) achieving satisfactory GPA scores. The analysis of the relationship between learning motivation and GPA yielded a p-value of 0.000, indicating a statistically significant association.

To evaluate the strength of the relationship between motivation levels and GPA scores, additional bivariate analysis was conducted. Motivation levels were categorized into two groups: "Low-Moderate" and "High." The Odds Ratio was calculated to quantify the degree of association between these variables.

Table 8. Odds Ratio Between Learning Motivation and GPA

Variable	Cumulative GPA		Total	*Odds Ratio* (95% CI)
	Satisfactory	Unsatisfactory		
Level of Motivation				
High	64 (98,5%)	1 (1,5%)	65	17,067 (2,041 – 142,699)
Low – Medium	30 (78,9%)	8 (21,1%)	38	
Low – Medium	30 (78,9%)	8 (21,1%)	38	

Based on Table 5.8, the Odds Ratio (OR) was found to be greater than 1, specifically 17.067 (95% CI = 2.041 – 142.699). This indicates a strong association, suggesting that students with higher learning motivation are significantly more likely to achieve satisfactory GPA scores compared to those with lower motivation levels.

Discussion

The results indicate a significant relationship between smartphone addiction and learning motivation among preclinical students at the Faculty of Medicine, Universitas Pelita Harapan, with a p-value of 0.013. The OR of 3.0 (95% CI = 1.27 – 7.085) suggests that students experiencing smartphone addiction are three times more likely to exhibit high learning motivation compared to those without smartphone addiction. This finding aligns with Bagania's research, which demonstrated a positive correlation between smartphone use and learning motivation, implying that increased smartphone usage is associated with higher motivation to learn. Similarly, this is consistent with the study by Pasulu et al., which highlights that smartphone, when used as a digital learning tool, can enhance learning motivation if utilized appropriately. However, these results contrast with the findings of Sari and Lin, who reported a negative correlation between smartphone addiction and learning motivation.[13,17] The

discrepancies in the findings may be attributed to variations in smartphone usage patterns and the differing types of learning motivation demonstrated by students.

The relationship between smartphone addiction and GPA is statistically significant, with a p-value of 0.029. Students exhibiting smartphone addiction are nearly five times more likely to achieve a satisfactory GPA (OR = 4.963; 95% CI 1.157–21.288). This finding aligns with the research conducted by Han and Maria, which demonstrated that the productive use of smartphones can contribute to improved academic performance, as reflected in higher GPAs.[9,18] To maximize the academic benefits of smartphones, careful management is required.[19] Conversely, the studies by Lee and Amez found a negative correlation between smartphone addiction and academic achievement.[20,21]

Furthermore, there is a significant relationship between the level of learning motivation and GPA (p-value = 0.000). Students with high motivation are 17 times more likely to achieve a satisfactory GPA compared to those with low to moderate motivation (OR = 17.067; 95% CI 2.041–142.699). This result aligns with the findings of Eunike and Steinmeyr, who underscore the positive impact of learning motivation on academic achievement.[8,22] Learning motivation encourages individuals to study diligently and set aside distractions. Therefore, high motivation is necessary for achieving success and improving academic performance.[23] Overall, the results of this study affirm that both smartphone addiction and learning motivation significantly contribute to academic achievement, with productive smartphone use being a key factor that needs attention.

Conclusion

Based on the findings of the study conducted among preclinical students at the Faculty of Medicine, Universitas Pelita Harapan, it can be concluded that smartphone addiction demonstrates a significant association with both learning motivation and students' GPA. Furthermore, the level of learning motivation also exhibits a significant relationship with GPA. The majority of respondents were found to exhibit smartphone addiction, possess high learning motivation, and achieve satisfactory GPA scores. For future research, it is recommended to delve deeper into how students utilize smartphones within the context of learning, explore the various types of learning motivation among students, and examine additional factors—both direct and indirect—that may influence GPA. Such investigations would contribute to a more comprehensive understanding of these dynamics.

References

1. Debora Suryawan A, Putra E. Analysis of Determining Factors for Successful Student's GPA Achievement. Proceedings - 11th 2016 International Conference on Knowledge, Information and Creativity Support Systems, KICSS 2016. 2017 Jun 16; http://dx.doi.org/10.1109/KICSS.2016.7951403
2. Kementrian Pendidikan KR dan T. Peraturan Menteri Nomor 3 Tahun 2020 Tahun 2020 tentang Standar Nasional Pendidikan Tinggi | JDIH. 2020.
3. Rafiqah M, Yusmansyah Y, Mayasari S. Pengaruh Motivasi Belajar Siswa Terhadap Prestasi Belajar Siswa. ALIBKIN (Jurnal Bimbingan Konseling). 2013 Jul 16 ;2(2). https://jurnal.fkip.unila.ac.id/index.php/ALIB/article/view/1661
4. Sharma P, Singh P, Kalhan S, Garg S. Analysis of Factors Affecting Academic Performance of MBBS Students in Pathology. Annals of International Medical and Dental Research (AIMDR) 2017; 2(5). http://dx.doi.org/10.21276/aimdr.2017.3.5.PT4
5. Farooq MS, Chaudhry AH, Shafiq M, Berhanu G. Factors Affecting Students' Quality of Academic Performance: A Case of Secondary School Level. Journal of Quality and Technology Management. 2011; 7(2):1–14. https://tinyurl.com/mu4dsum3
6. Umboh ER, Kepel B, Hamel RS. Hubungan Antara Motivasi Belajar Dengan Prestasi Akademik Pada Mahasiswa Program Studi Ilmu Keperawatan Fakultas Kedokteran Universitas Sam Ratulangi Manado. e-journal Keperawatan. 2017 ;5(1). https://doi.org/10.35790/jkp.v5i1.15824
7. Alson J, Smartphones Usage Among College Students. IMPACT: International Journal of Research in Engineering & Technology 2016 4:63–70. https://tinyurl.com/yc6hb3k3
8. Hyangsewu P, Rindu M, Islamy F, Parhan M, Nugraha RH. Efek Penggunaan Gadget terhadap Social Behavior Mahasiswa dalam Dimensi Globalisasi. Jurnal Penelitian Ilmu Pendidikan. 2021 Oct 23 ;14(2):127–36. http://dx.doi.org/10.21831/jpipfip.v14i2.39156
9. Han S, Yi YJ. How Does The Smartphone Usage Of College Students Affect Academic Performance? J Comput Assist Learn. 2019 Feb 1 ;35(1):13–22. http://dx.doi.org/10.1111/jcal.12306
10. Abbasi GA, Jagaveeran M, Goh YN, Tariq B. The Impact Of Type Of Content Use On Smartphone Addiction And Academic Performance: Physical Activity As Moderator. Technol Soc. 2021 Feb 1;64:101521. https://doi.org/10.1016/j.techsoc.2020.101521
11. Kibona L, Mgaya G. Smartphones' Effects on Academic Performance of Higher Learning Students. Journal of Multidisciplinary Engineering Science and Technology. 2015;2(4). https://www.jmest.org/wp-content/uploads/JMESTN42350643.pdf

12. Arake A, Winarti Y. Literature Review : Hubungan Antara Kecanduan Smartphone dengan Prestasi Belajar pada Remaja di Indonesia. Borneo Student Research. 2022; 3(2). https://journals.umkt.ac.id/index.php/bsr/article/view/2829
13. Sari, M. Hubungan Penggunaan Gadget Dan Motivasi Belajar Terhadap Hasil Belajar Peserta Didik Kelas Xii Sma Negeri 01 Kotabumi Tahun Ajaran 2021/2022. 2023.
14. Arthy CC, Effendy E, Amin MM, Loebis B, Camellia V, Husada MS. Indonesian Version of Addiction Rating Scale of Smartphone Usage Adapted from Smartphone Addiction Scale-Short Version (SAS-SV) In Junior High School. Open Access Maced J Med Sci. 2019 Oct 10;7(19):3235. https://doi.org/10.3889/oamjms.2019.691
15. Putri YT, Oktaria D. Motivated Strategies for Learning Questionnaire: Instrumen Objektif Penilaian Motivasi Belajar. Medula. 2017;7(5).
16. Pasulu M, Hasby M, & Yanti R. Pengaruh Penggunaan Smarthphone terhadap Motivasi Belajar Siswa Sekolah Dasar di Masa Pandemi Covid-19 di Kecamatan Wara Kota Palopo. DEIKTIS: Jurnal Pendidikan Bahasa dan Sastra, 2021; 1(2): 175-182. https://doi.org/10.53769/deiktis.v1i2.163
17. Lin YG, McKeachie WJ, Kim YC. College Student Intrinsic And/Or Extrinsic Motivation And Learning. Learn Individ Differ. 2001;13(3):251–8. http://dx.doi.org/10.1016/S1041-6080(02)00092-4
18. Maria N. Pengaruh Penggunaan Smartphone Terhadap Nilai Akademik Mahasiswa. ComTech. 2013;4(2):652–8. http://dx.doi.org/10.21512/comtech.v4i2.2488
19. Alqodri A, Dirajisaka M, Sulthan M. Analisis Pengaruh Pemanfaatan Smartphone Terhadap Akademik Mahasiswa Fakultas Ilmu Komputer Universitas Pamulang. Kohesi: Jurnal Sains dan Teknologi. 2024; 6(2):1-9. https://doi.org/10.3785/kohesi.v6i2.9366
20. Amez S, Baert S. Smartphone Use and Academic Performance: A Literature Review. Int J Educ Res. 2020 Jan 1;103:101618. http://dx.doi.org/10.1016/j.ijer.2020.101618
21. Lee J, Cho B, Kim Y, Noh J. Smartphone Addiction In University Students And Its Implication For Learning. Lecture Notes in Educational Technology. 2015;(9783662441879):297–305. http://dx.doi.org/10.1007/978-3-662-44188-6_40
22. Steinmayr R, Weidinger AF, Schwinger M, Spinath B. The Importance Of Students' Motivation For Their Academic Achievement-Replicating And Extending Previous Findings. Front Psychol. 2019 Jul 31;10(JULY):464340. https://doi.org/10.3389/fpsyg.2019.01730
23. Nursamiaji A, Kurniawan K. Hubungan Motivasi Belajar dengan Prestasi Akademik Mahasiswa Bimbingan dan Konseling 2013 UNNES. Indonesian Journal of Guidance and Counseling Theory and Application. 2015; 4(3): 24-31. https://doi.org/10.15294/ijgc.v4i3.7561

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