

The Problem of Smartphone Addiction Among Students of the Malaysian Institute of Teacher Education (IPG)

Chor Shi Kang^{1*} , Chan Xiau Thung² , Saw Jing Wen³ 
Mohd Muslim bin Md Zalli⁴ 

¹Faculty of Human Development, Sultan Idris Education University (UPSI), 35900 Tanjong Malim, Perak, Malaysia.

Email: chorshikang@gmail.com

²Faculty of Music and Performing Arts, Sultan Idris Education University (UPSI), 35900 Tanjong Malim, Perak, Malaysia.

Email: xiauthungchan0507@gmail.com

³Faculty of Human Development, Sultan Idris Education University (UPSI), 35900 Tanjong Malim, Perak, Malaysia.

Email: jingwensaw2000@gmail.com

⁴Faculty of Human Development, Sultan Idris Education University (UPSI), 35900 Tanjong Malim, Perak, Malaysia.

Email: muslim@fpm.upsi.edu.my

ABSTRACT

This study investigates the factors, effects and level of smartphone addiction among students at the Malaysian Institute of Teacher Education (IPG). Smartphone addiction is an increasingly serious concern because it can disrupt students' academic performance, emotional well-being and social functioning. A descriptive quantitative design was used that involved 50 IPG students selected through purposive and convenience sampling. Data were collected via a questionnaire adapted from the Malay Version of the Smartphone Addiction Scale (SAS-M) which covered dimensions such as Positive Anticipation, Primacy and Daily Life Disturbance. Descriptive statistics (mean, standard deviation and percentage) were applied for analysis. Results show that Positive Anticipation is the strongest contributing factor ($M = 4.34$, high), followed by Primacy ($M = 3.46$) and Cyberspace-Oriented Relationships ($M = 3.37$) which are both at moderate levels. Besides, Overuse recorded the highest mean ($M = 4.33$) indicating excessive smartphone use as the main consequence. Daily Life Disturbance was also notable ($M = 3.76$) with students reporting reduced focus on daily tasks due to smartphone use. Overall smartphone addiction was moderate ($M = 3.72$) with 98.0% of respondents in the moderate category. The findings highlight the need for coordinated action by IPG administrators, students and parents. Recommended measures include digital literacy modules, counselling support and strengthened campus technology policies. Students are encouraged to enhance self-control and time management. Future studies should involve larger samples and longitudinal or experimental designs to evaluate

CORRESPONDING AUTHOR (*):

Chor Shi Kang
(chorshikang@gmail.com)

KEYWORDS:

Smartphone Addiction
Institute of Teacher Education (IPG)
Bronfenbrenner's Ecological Systems Theory
Erik Erikson Psychosocial Development Theory
Quantitative Research

CITATION:

Chor, S. K., Chan, X. T., Saw, J. W., & Mohd Muslim, M. Z. (2026). The Problem of Smartphone Addiction Among Students of the Malaysian Institute of Teacher Education (IPG). *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 11(3), e003840. <https://doi.org/10.47405/mjssh.v11i3.3840>

intervention effectiveness.

Contribution/Originality: This study offers empirical evidence on smartphone addiction specifically within the IPG teacher education context by identifying dominant contributing factors and key impacts using SAS-M dimensions thereby informing targeted campus-based prevention and support strategies.

1. Introduction

Smartphone addiction has become an increasingly worrying global issue particularly among students. Although smartphones provide convenience for communication, entertainment and learning, excessive use may lead to addiction that affects users' mental, social and academic well-being (Kwon et al., 2013; Ching et al., 2015). In Malaysia, this phenomenon is increasingly evident among students at the Institute of Teacher Education (IPG) who are those future educators of the nation (Ching et al., 2020).

Past studies show that smartphone addiction is closely associated with academic pressure, social tendencies and a lack of self-control (Chen, 2023; Li et al., 2024) as well as it can result in learning disruptions, mental fatigue and declining academic performance (Huang & Chen, 2019; Guo, 2019). Obviously, academic pressure combined with the responsibility of becoming teachers further increases the risk of addiction among IPG students (Razak et al., 2024). This affects their ability to manage time and sustain learning focus, potentially undermining the quality of their future teaching (Tan, 2024; Chen & Zhang, 2024).

This addiction is also influenced by modern lifestyles and strong attachment to social media applications (Guo, 2024; Yuan & Ma, 2024). Studies indicate that more than 70.0 percent of students use smartphones for purposes other than learning during lectures (Huang & Chen, 2019) which highlights the need for intervention strategies. Moreover, smartphone addiction is linked to mental health issues such as depression, anxiety and social isolation (Rahman & Abdullah, 2021; Li, 2024).

Therefore, this study seeks to understand the factors and effects of smartphone addiction among IPG students in order to design more effective intervention measures for their well-being and effectiveness as future educators.

1.1. Problem Statement

Smartphone addiction among IPG students in Malaysia is increasingly concerning particularly because they are future educators who should model ethical and responsible technology use. While smartphones have the potential to enhance communication and learning, uncontrolled use can seriously disrupt academic focus, time management and pedagogical competence (Huang & Chen, 2019; Chen & Zhang, 2024).

Previous studies indicate that excessive smartphone use is closely related to disruptions during learning sessions, poor time management and lower academic achievement (Huang & Chen, 2019; Guo, 2019). In addition, this addiction can have psychological effects such as stress, depression and emotional anxiety (Rahman & Abdullah, 2021; Li,

2024). Students with low self-control are more likely to experience declining motivation and academic performance (Chen & Zhang, 2024).

Although many studies have examined smartphone addiction among university students in general, there remains a specific gap in the literature regarding IPG students who experience unique pressures not only academically but also professionally as role models in education (Razak et al., 2024). Unlike typical university students, IPG students must balance academic demands with pedagogical training and practicum requirements caused making them more exposed to the negative effects of excessive technology use (Tan, 2024).

Furthermore, existing teacher education programs in Malaysia tend to focus on technology use without providing adequate guidance on disciplined and healthy use (Tan, 2024). This lack of support leaves students unprepared to manage their own digital habits, let alone guide their future pupils.

Accordingly, this study aims to address the gap in understanding the specific factors contributing to smartphone addiction among IPG students and its effects on their academic and emotional well-being. The study also seeks to contribute to the development of more focused intervention strategies and institutional policies not only to reduce addiction risk but also to strengthen the effectiveness of teacher preparation in the digital era.

1.2. Research Objectives

This study aims to identify, understand and address smartphone addiction among IPG students in Malaysia. As future educators, they play an important role in shaping the values and discipline of the next generation. Therefore, understanding the causes and effects of this addiction is crucial to ensure IPG students can manage smartphone use more responsibly.

Specifically, the objectives of this study are:

- i. To identify factors that contribute to smartphone addiction among IPG students.
- ii. To identify the effects of smartphone addiction on the daily lives of IPG students.
- iii. To assess the level of smartphone addiction among IPG students.

1.3. Research Questions

This study is designed to answer the following questions:

- i. What factors contribute to smartphone addiction among IPG students?
- ii. What are the effects of smartphone addiction on the daily lives of IPG students?
- iii. What is the level of smartphone addiction among IPG students?

1.4. Theoretical Approach

This study uses two main theoretical approaches to understand smartphone addiction among IPG students, which are Bronfenbrenner's Ecological Systems Theory and Erikson's Psychosocial Development Theory. Together, these theories provide a comprehensive framework for examining how environmental factors and psychosocial development contribute to addictive behaviours.

1.4.1. Bronfenbrenner's Ecological Systems Theory

This theory emphasises that individual development is influenced by interactions across multiple environmental layers especially the microsystem and chronosystem (Bronfenbrenner, 1979, 1986; Bronfenbrenner & Morris, 2006). In the context of IPG students, peer influence and limited family monitoring of smartphone use play important roles in shaping digital habits. In addition, rapid technological changes (chronosystem) contribute to dependence on smartphones in daily life which include learning and social interactions.

1.4.2. Erik Erikson's Psychosocial Development Theory

Erik Erikson's theory focuses on the stage of Intimacy vs. Isolation, which is relevant to IPG students in early adulthood (Erikson, 1950). At this stage, the need to build meaningful social relationships may encourage students to use smartphones as communication tools, particularly through social media (Orenstein & Lewis, 2020). However, excessive reliance on virtual interaction may hinder the development of face-to-face interpersonal skills, which are essential in the teaching profession.

By integrating these two approaches, the study can identify how students' social contexts and psychological development influence their tendency toward smartphone addiction and the implications for their professional development as future educators.

1.5. Conceptual Framework

The conceptual framework for this study is based on Bronfenbrenner's Ecological Systems Theory and Erikson's Psychosocial Development Theory to explain smartphone addiction among IPG students.

From Bronfenbrenner's theory, the microsystem and chronosystem are used to understand how interactions with the immediate environment (such as peers and family) and time-related influences (such as technological changes) contribute to addictive behaviour (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006).

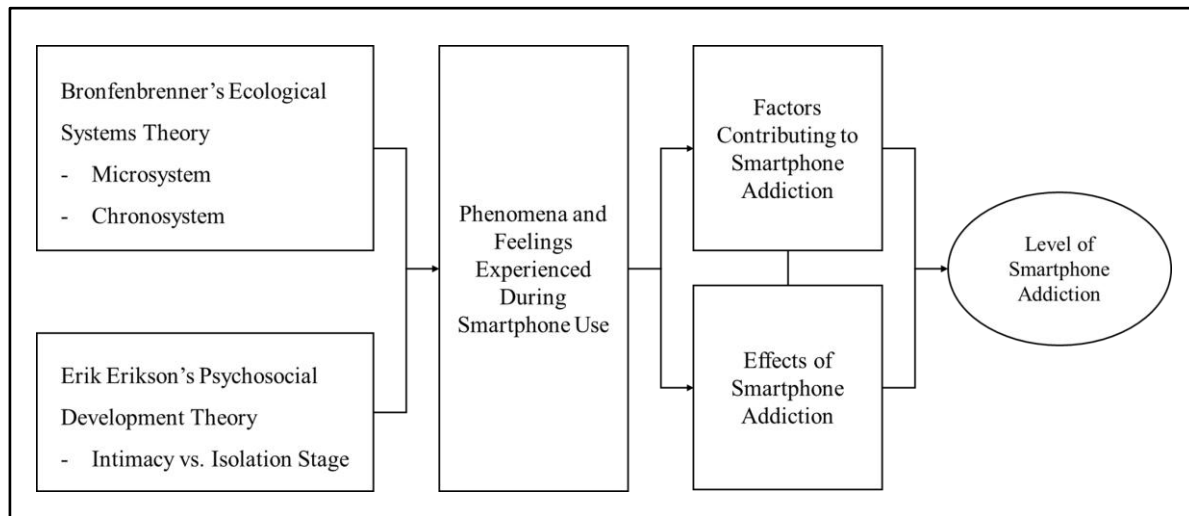
Erikson's psychosocial theory highlights the Intimacy vs. Isolation conflict in young adulthood helps to explain how smartphone addiction may disrupt students' ability to build meaningful and deep social relationships (Erikson, 1950).

Based on these theories, the conceptual framework comprises three main elements:

- i. Factors of smartphone addiction
- ii. Effects of smartphone addiction
- iii. Level of smartphone addiction

Figure 1 illustrates the conceptual framework of the study. The framework shows how Bronfenbrenner's Ecological Systems Theory (microsystem and chronosystem) and Erikson's Psychosocial Development Theory (Intimacy vs. Isolation stage) jointly shape the phenomena and feelings experienced during smartphone use. These theoretical lenses inform the identification of smartphone addiction factors (Positive Anticipation, Primacy and Cyberspace-Oriented Relationships) and the effects of smartphone addiction (Daily Life Disturbance, Withdrawal and Overuse) which together determine the overall level of smartphone addiction among IPG students.

Figure 1: Conceptual Framework of the Study



Source: Authors' construct based on Bronfenbrenner (1979), Bronfenbrenner and Morris (2006) and Erikson (1950)

As illustrated in Figure 1, these elements are interconnected in analysing students' experiences, behaviours and well-being. The framework also guided the development of the questionnaire instrument used in this study to assess the study variables among IPG students.

2. Literature Review

This section discusses the literature on smartphone addiction in terms of definition, contributing factors, effects and findings from previous studies locally and internationally. This review forms the conceptual and empirical basis for understanding smartphone addiction among IPG students and identifying knowledge gaps that justify the present study.

2.1. Smartphone Addiction among Students

Smartphone addiction is a growing global issue and is increasingly prominent among students in Malaysia. It refers to excessive smartphone use that disrupts daily life balance, including academic performance, social relationships and mental health (Kwon et al., 2013; Ching et al., 2015). Local studies report a high percentage of students using smartphones for more than 5 hours per day (Aziz et al., 2021) and 62.0 percent of parents report their children's attention problems due to uncontrolled use (Ibrahim & Hamdan, 2023).

Factors such as academic pressure, social needs and low self-control have been identified as key contributors. Students often use smartphones to avoid pressure with social anxiety and depression acting as triggers (Bu et al., 2023; Ching et al., 2020). Cultural influences also play an important role, students living in environments that encourage technology use tend to show higher addiction levels (Li & Jin, 2019).

In terms of impact, addiction can harm psychological and emotional well-being. Students who struggle to regulate emotions may use smartphones as an avoidance tool which

ultimately disrupts social relationships and mental balance (Guo, 2019). For IPG students, this situation is particularly concerning given their academic workload and high professional responsibilities.

Overall, smartphone addiction among students is a complex phenomenon involving a combination of internal and external factors. A deeper understanding of these factors is essential for designing effective intervention strategies.

2.2. Effects of Smartphone Addiction

Smartphone addiction has wide-ranging effects on students' well-being, including mental, academic, social and physical aspects. These effects not only affect current performance but may also disrupt the long-term development of IPG students.

2.2.1. Mental Health

Excessive smartphone use is associated with anxiety, depression and emotional stress (Rahman & Abdullah, 2021). The phenomenon of nomophobia (fear of being disconnected from one's smartphone) can lead to social withdrawal and difficulty managing emotions (Bu et al., 2023). Sleep problems are also reported which shows 40.0 percent of students experience insomnia due to smartphone use before bedtime (Liu, 2024).

2.2.2. Academic Performance

Smartphone addiction reduces students' focus on academic tasks. Studies show that addicted students score about 15.0 percent lower in examinations compared with peers who use smartphones in a controlled manner (Huang & Chen, 2019). Time spent on entertainment such as gaming or social media reduces time for formal learning (Ching et al., 2020; Fauzi & Mahmood, 2024).

2.2.3. Social Relationships

Dependence on virtual interaction can prevent students from building high-quality face-to-face relationships (Li et al., 2024). The habit of using smartphones during conversations may also create interpersonal conflict and negative perceptions of the individual (Guo, 2019).

2.2.4. Physical Well-being

Excessive use is linked to physical problems such as neck pain, eye strain and unhealthy posture. One study reported that 55.0 percent of students experienced these symptoms due to excessive smartphone use (Zameran et al., 2022). Prolonged sedentary activity also increases the risk of obesity and reduces physical fitness.

Overall, the effects of smartphone addiction are diverse and interconnected. Disturbed mental well-being, academic performance and social relationships require serious attention so that comprehensive interventions can be developed.

2.3. Previous Studies in Malaysia

Smartphone addiction among students in Malaysia has been explored in various local studies examining contributing factors, effects and usage levels in educational contexts.

Ching et al. (2015) developed a Malay version of the Smartphone Addiction Scale and found that addiction negatively affects time management and academic attention, highlighting the importance of awareness regarding responsible use. Aziz et al. (2021) reported that academic pressure leads university students to use smartphones excessively as a way to relieve stress with 65.0 percent of students engaging in such behaviour.

Fauzi and Mahmood (2024) examined polytechnic students' attitudes toward smartphone use and found that social media is a key contributor to addiction, recommending stronger digital literacy in educational institutions. Hazmi (2008) identified technology fatigue among students overly dependent on smartphones for online learning which affected their well-being and academic performance.

In the IPG context, Razak et al. (2024) found that 60.0 percent of teacher trainees experienced smartphone addiction which affected time management skills and their ability to fulfil academic and social responsibilities. This highlights the need for special interventions for future educators.

Overall, local studies indicate that academic pressure, social media use and attitudes toward technology play important roles in driving smartphone addiction. These findings provide a strong basis for understanding the issue in Malaysia and developing appropriate preventive measures.

2.4. Previous International Studies

Smartphone addiction is a global concern and international studies provide deeper understanding of contributing factors, psychosocial effects and usage patterns.

Kwon et al. (2013) in South Korea developed the Smartphone Addiction Scale (SAS) and linked addiction to anxiety, depression and low self-control. They found that excessive use of entertainment applications increases addiction levels.

Liu et al. (2024) in China reported that 32.0 percent of addicted university students experienced insomnia, social anxiety and academic stress. Smartphones were viewed as a stress-avoidance tool that further reinforced dependency.

In India, Achangwa et al. (2023) reported decreased motivation and study time among university students who used smartphones heavily for social media and gaming, emphasising the need to educate students about prudent technology use.

Shin and Manisah (2020) identified nomophobia in Japan which is fear of being disconnected from smartphones. They reported that 40.0 percent of students who relied on smartphones as their main communication tool experienced such symptoms.

Panova and Carbonell (2018) in Spain found that dependence on virtual interaction makes it difficult for students to build real social relationships, highlighting the importance of balancing digital and face-to-face interactions.

Overall, these international findings support the need for research in Malaysia and provide relevant comparative foundations for understanding smartphone addiction among IPG students more holistically.

3. Methodology

3.1. Research Design

This study used a descriptive quantitative research design to identify the factors, effects and level of smartphone addiction among IPG students in Malaysia. A descriptive design was chosen because it allows observation of the phenomenon in a natural setting without manipulating variables while enabling the collection of objective numerical data (Creswell, 2014). This approach is particularly appropriate for examining the current state of smartphone addiction behaviour and its prevalence within a defined population.

This quantitative approach also allows the researcher to evaluate IPG students' behavioural patterns based on addiction constructs such as daily life disturbance, positive anticipation, primacy, withdrawal symptoms, cyberspace-oriented relationships and overuse (Kwon et al., 2013).

Data were collected through a structured questionnaire whose reliability had been established through previous pilot testing. The questionnaire was distributed to selected respondents and analysed using descriptive statistics such as means, frequencies and percentages. This method enables a deeper understanding of the level and pattern of smartphone addiction among students.

Through this design, the study provides a comprehensive picture of addictive smartphone behaviour and contributes to the development of more effective intervention strategies at the IPG level.

3.2. Research Location

This study was conducted at Institut Pendidikan Guru Kampus Ipoh (IPG Kampus Ipoh), located at Jalan PPH, 31150 Hulu Kinta, Ipoh, Perak, Malaysia. IPG Kampus Ipoh is one of 27 teacher education campuses administered by Institut Pendidikan Guru Malaysia (IPGM) under the Ministry of Education Malaysia (Kementerian Pendidikan Malaysia, 2020). The campus was established in 1977 and has operated at its current 42.5-acre site in Hulu Kinta since 1983. It offers several teacher education programmes, most notably the Program Ijazah Sarjana Muda Perguruan (PISMP), a four-year bachelor's degree programme that trains pre-service teachers primarily for primary education (Kementerian Pendidikan Malaysia, 2018).

This location was selected for three reasons. First, IPG Kampus Ipoh is a well-established teacher education institution in the northern zone of Peninsular Malaysia with a diverse student cohort in terms of ethnicity, gender and programme specialisation making it suitable for descriptive research on technology use behaviour. Second, the campus enrolls students who are future educators which shows their smartphone use behaviour

carries direct implications for the education of future generations (Wong, 2023; Mukarromah & Andriana, 2022). Third, a previous study at this campus by Hazmi (2008) reported technology fatigue among students suggesting that the issue of excessive technology use is relevant to this specific institutional context.

3.3. Population and Sample

3.3.1. Study Population

The target population of this study comprised all students enrolled in teacher education programmes at IPG Kampus Ipoh at the time of data collection. This included students from the *Program Persediaan Ijazah Sarjana Muda Perguruan* (PPISMP) and the *Program Ijazah Sarjana Muda Perguruan* (PISMP) across various specialisations. As one of 27 IPG campuses nationwide, the campus enrolls several hundred pre-service teachers across multiple year cohorts and programme tracks (Kementerian Pendidikan Malaysia, 2020). The study specifically targeted student participants who also known as pre-service teachers and did not include lecturers, administrative staff or other stakeholders.

3.3.2. Sample Size and Justification

A total of 50 students participated in this study. The sample size was determined based on methodological guidelines for descriptive research. According to Roscoe (1975), sample sizes between 30 and 500 are generally appropriate for behavioural research, and this range has been widely adopted in educational studies. Hill (1998) further recommends a minimum of 30 participants for descriptive studies to enable meaningful statistical analysis, while Connelly (2008) suggests that sample sizes of 30 to 50 are adequate for pilot and preliminary descriptive investigations. The present sample of 50 respondents meets all three of these thresholds.

Given the descriptive and exploratory nature of this study, the primary objective was to describe patterns and tendencies of smartphone addiction within a specific institutional context rather than to test hypotheses or make causal inferences. As such, probability-based sample size calculations were not applicable. The sample of 50 is sufficient to capture variation in student demographics including age, gender, ethnicity and programme of study as well as to provide a meaningful descriptive profile of smartphone addiction levels among IPG students. It is acknowledged that the sample size is relatively small, which limits the generalisability of the findings to the broader IPG student population nationwide as this limitation is addressed in the discussion section.

3.3.3. Sampling Method

Probability sampling was not feasible in this study as a complete and updated sampling frame means that a full list of all enrolled students at the campus was not accessible to the researcher and participation was contingent upon voluntary informed consent. Consequently, respondents were selected using a combination of purposive sampling and convenience sampling which both are non-probability sampling techniques.

Purposive sampling was employed to ensure that only participants who met specific predefined inclusion criteria were selected like (a) currently enrolled as a student in a teacher education programme (PPISMP or PISMP) at IPG Kampus Ipoh, (b) an active

smartphone user who can be defined as using a smartphone daily for communication, social media or entertainment purposes and (c) willingness to provide voluntary informed consent to participate. These criteria were essential to ensure that the data collected were directly relevant to the research objectives of examining smartphone addiction behaviour among pre-service teachers. Convenience sampling was then applied within this purposively defined target group whereby respondents who were accessible and available during the data collection period were invited to participate. This was necessary given the practical constraints of the study including limited data collection time and the researcher's reliance on respondents' voluntary availability.

This combined approach is consistent with the recommendations of Etikan, Musa and Alkassim (2016), who note that non-probability sampling techniques are appropriate when randomisation is not possible and when the research does not aim to produce generalisable population-level estimates but rather seeks to explore patterns within a specific context. Creswell (2014) similarly acknowledges that purposive sampling is suitable for descriptive studies where the researcher intentionally selects participants who can provide relevant information about the phenomenon under investigation.

3.4. Data Collection

This study used a questionnaire administered via Google Forms as the primary data collection instrument. The questionnaire was adapted based on the Smartphone Addiction Scale (SAS) by Kwon et al. (2013), with modifications tailored to the IPG context in Malaysia. The Malay version of the SAS (SAS-M) was validated by Ching et al. (2015) enabling its valid and reliable use among Malaysian student populations.

The questionnaire was organised into three main sections to collect demographic information, smartphone usage patterns and smartphone addiction dimensions. The total number of items was 38, as summarised in Table 1.

Table 1: Contents of the Research Instrument

Section	Construct	Dimension	Description	Number of Items
Section 1		-	Respondent Demographics	7
Section 2	Factors	A	Positive Anticipation	4
		B	Primacy	5
		C	Cyberspace-Oriented Relationships	7
	Effects	D	Daily Life Disturbance	6
		E	Withdrawal	4
		F	Overuse	7
			Total	38

The questionnaire used a six-point Likert scale: 1 (Strongly Disagree), 2 (Disagree), 3 (Somewhat Disagree), 4 (Somewhat Agree), 5 (Agree) and 6 (Strongly Agree). Respondents indicated their degree of agreement for each item.

Section 2 contained 33 items adapted from SAS-M. This section comprised two main constructs with six dimensions to identify the factors and effects of smartphone addiction. The complete list of items for each dimension is presented in Table 2.

Table 2: Items for Smartphone Addiction Dimensions (Translated)

Construct	Dimension	Item No.	Item Statement (English translation)
FACTORS	A. Positive Anticipation	1	I feel calm and comfortable when using a smartphone.
		2	I feel happy and excited when using a smartphone.
		3	I feel confident when using a smartphone.
		4	I can relieve stress through my smartphone.
	B. Primacy	5	Nothing is more enjoyable than using a smartphone.
		6	My life feels empty without a smartphone.
		7	I feel very free when using a smartphone.
		8	Using a smartphone is the most enjoyable thing.
		9	I cannot endure being without a smartphone.
	C. Cyberspace - Oriented Relationship	10	I bring my smartphone to the toilet even when I am in a hurry.
		11	I feel great meeting more people through my smartphone.
		12	I feel my relationships with friends on the smartphone are closer than with real-life friends.
		13	When I cannot use my smartphone, it feels painful, like losing a friend.
		14	I feel friends on my smartphone understand me better than real-life friends.
		15	I constantly check my smartphone so I will not miss conversations on Twitter or Facebook.
	EFFECTS	D. Daily Life Disturbance	16
17			I cannot complete planned work because of smartphone use.
18			It is hard to concentrate in class, while doing assignments, or at work because of smartphone use.
19			I experience headaches or blurred vision because of excessive smartphone use.

	20	I feel pain in my wrist or neck while using a smartphone.
	21	I feel tired and sleep less because of excessive smartphone use.
	22	People around me say that I use my smartphone too often.
E. Withdrawal	23	I feel impatient and restless when I am not holding my smartphone.
	24	I keep thinking about my smartphone even when I am not using it.
	25	I will not stop using my smartphone even though it seriously disrupts my daily life.
	26	I feel irritated when I am interrupted while using my smartphone.
F. Overuse	27	I check social networking services (SNS) such as Twitter or Facebook as soon as I wake up.
	28	I prefer to search for information using a smartphone rather than asking other people.
	29	My smartphone battery does not last a day even after being fully charged.
	30	I use my smartphone longer than I intended.
	31	I feel the urge to use my smartphone as soon as I stop using it.
	32	I have tried several times to reduce smartphone use time, but always fail.
	33	I often think about reducing my smartphone usage time.

The instrument was arranged systematically to ensure that the collected data were relevant and aligned with the study objectives. The questionnaire was previously tested in pilot studies to ensure validity and reliability.

Validity refers to the extent to which an instrument measures what it is intended to measure, namely smartphone addiction (Ilias & Nor, 2019). In this study, the validity of SAS-M had been assessed through two main methods which are content validation and construct validation. Content validation involves expert review and Ching et al. (2015) reported that SAS-M achieved a Content Validity Index (CVI) above 0.78 indicating that the items are relevant and appropriate for this context. Construct validation ensures that the instrument truly measures smartphone addiction constructs as intended. SAS-M retains the six-factor structure from the original version including daily life disturbance, overuse and cyberspace-oriented relationships supported by factor analysis in prior studies (Kwon et al., 2013; Ching et al., 2015). Besides, Table 3 summarises the reliability coefficients from previous studies.

Table 3: Items for Smartphone Addiction Dimensions (Translated)

Study	Context	Cronbach's Alpha (α)	Interpretation
Kwon et al. (2013)	Original version (South Korea)	0.91	Very high internal reliability.
Ching et al. (2015)	Malay version	0.86	Adapted for Malaysian context (medical students).

In terms of reliability, SAS-M demonstrates high internal consistency. Reliability refers to the extent to which an instrument produces consistent data across time or across different populations. The original SAS study reported Cronbach's alpha as high as 0.97, while the Malay version reported $\alpha = 0.86$ (Ching et al., 2015). This value is acceptable for use in Malaysia, particularly among higher education students. A new pilot study was not conducted in the present study because the reliability of SAS-M has already been established. Therefore, using SAS-M enables the collection of valid, consistent and appropriate data for assessing smartphone addiction among IPG students.

3.5. Data Analysis

In this study, IBM SPSS version 29 was used to analyse the questionnaire data. The analysis process involved coding, classifying and entering data (Chua, 2019).

Descriptive statistics were applied to assess the level of smartphone addiction. Mean and median analyses were used to determine respondents' tendencies toward questionnaire items. As noted by Pallant (2020), the midpoint of a Likert scale is important for interpreting data. In this study, the six-point Likert scale (1.00 to 6.00) was divided into three equal intervals using the formula: interval width = (maximum value - minimum value) / number of levels = $(6 - 1) / 3 = 1.67$ (Pallant, 2020). This yielded the following interpretation criteria: Low (1.00–2.66), Moderate (2.67–4.32) and High (4.33–6.00). These thresholds were applied consistently across all item-level, dimension-level and construct-level mean scores in the findings.

3.6. Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the Malaysian Code of Responsible Conduct in Research (MOHE, 2018). It involved a low-risk anonymous survey of adult participants (aged 18 and above) and no sensitive personal data or personally identifiable information were collected. Formal ethics committee approval was not sought for this study. Before participation, respondents were informed of the purpose and procedures of the study as well as the voluntary nature of participation, their right to withdraw at any time without penalty and the measures taken to ensure confidentiality and anonymity. Informed consent was obtained through the opening section of the Google Form questionnaire, where participants were required to read the consent statement and indicate their agreement before proceeding to the survey items. All responses were collected anonymously, stored securely and used solely for research purposes.

4. Results

4.1. Analysis of Factors of Smartphone Addiction

Descriptive analysis of the factors constructed identified three main dimensions: Positive Anticipation, Primacy and Cyberspace-Oriented Relationships. The mean scores, standard deviations and interpretation levels for each item are presented in Table 4.

Table 4: Mean and Standard Deviation Scores for Factors of Smartphone Addiction

Dimension	No.	Item Statement (English translated)	Mean	SP	Interpretation
A. Positive Anticipation	1	I feel calm and comfortable when using a smartphone.	4.50	0.707	High
	2	I feel happy and excited when using a smartphone.	4.60	0.606	High
	3	I feel confident when using a smartphone.	3.74	0.921	Moderate
	4	I can relieve stress through my smartphone.	4.35	0.646	High
Overall:			4.34	0.359	High
B. Primacy	5	Nothing is more enjoyable than using a smartphone.	2.46	0.645	Low
	6	My life feels empty without a smartphone.	3.32	0.652	Moderate
	7	I feel very free when using a smartphone.	4.58	0.498	High
	8	Using a smartphone is the most enjoyable thing.	2.58	0.835	Low
	9	I cannot endure being without a smartphone.	4.34	0.626	High
Overall:			3.46	0.313	Moderate
C. Cyberspace -Oriented Relationships	10	I bring my smartphone to the toilet even when I am in a hurry.	4.38	0.696	High
	11	I feel great meeting more people through my smartphone.	4.36	0.484	High
	12	I feel my relationships with friends on the smartphone are closer than with real-life friends.	2.60	0.606	Low

13	It feels painful, like losing a friend, when I cannot use my smartphone.	2.66	0.519	Low
14	I feel friends on my smartphone understand me better than real-life friends.	2.64	0.721	Low
15	I constantly check my smartphone so I will not miss conversations on Twitter or Facebook.	4.34	0.688	High
16	I choose to talk to friends via my smartphone rather than face-to-face with friends or other family members.	2.64	0.597	Low
Overall:		3.37	0.262	Moderate
OVERALL (FACTORS CONSTRUCT):		3.72	0.169	Moderate

The Positive Anticipation dimension recorded an overall mean of 4.34 (SD = 0.359) indicating a high level. Items such as “I feel happy and excited when using a smartphone” (mean = 4.60, SD = 0.606) reinforce that smartphones function as sources of emotional gratification and stress reduction among students.

The Primacy dimension obtained an overall mean of 3.46 (SD = 0.313) at a moderate level. Although some items indicated high dependence such as “I cannot endure being without a smartphone” (mean = 4.34, SD = 0.626) while other items were low such as “Nothing is more enjoyable than using a smartphone” (mean = 2.46, SD = 0.645). This suggests that students still maintain alternative activities beyond smartphone use.

The Cyberspace-Oriented Relationships dimension recorded an overall mean of 3.37 (SD = 0.262) also at a moderate level. Items such as “I bring my smartphone to the toilet even when I am in a hurry” (mean = 4.38, SD = 0.696) and “I constantly check my smartphone so I will not miss conversations on Twitter or Facebook” (mean = 4.34, SD = 0.688) indicate certain tendencies. However, other items such as “I feel friends on my smartphone understand me better than real-life friends” were low (mean = 2.64, SD = 0.721) suggesting that while online interaction matters and it does not fully replace face-to-face relationships.

Overall, the analysis indicates that smartphone addiction factors among IPG students are at a moderate level with Positive Anticipation as the most dominant dimension. This implies that psychological satisfaction and emotional dependence are key drivers of continued smartphone use followed by primacy and cyberspace-oriented relationships.

4.2. Analysis of Effects of Smartphone Addiction

Descriptive analysis found that the effects construct comprised three dimensions: Daily Life Disturbance, Withdrawal and Overuse. The mean scores, standard deviations and interpretation levels for each item are presented in Table 5.

Table 5: Mean and Standard Deviation Scores for Effects of Smartphone Addiction

Dimension	No.	Item Statement (English translated)	Mean	SP	Interpretation
D. Daily Life Disturbance	17	I cannot complete planned work because of smartphone use.	3.76	0.686	Moderate
	18	It is hard to concentrate in class, while doing assignments, or at work because of smartphone use.	4.34	0.658	High
	19	I experience headaches or blurred vision because of excessive smartphone use.	2.58	0.641	Low
	20	I feel pain in my wrist or neck while using a smartphone.	2.66	0.626	Low
	21	I feel tired and sleep less because of excessive smartphone use.	4.40	0.606	High
	22	People around me say that I use my smartphone too often.	2.64	0.802	Low
Overall:			3.40	0.313	Moderate
E. Withdrawal	23	I feel impatient and restless when I am not holding my smartphone.	4.34	0.717	High
	24	I keep thinking about my smartphone even when I am not using it.	4.40	0.606	High
	25	I will not stop using my smartphone even though it seriously disrupts my daily life.	4.46	0.578	High
	26	I feel irritated when I am interrupted while using my smartphone.	2.66	0.688	Low
Overall:			3.97	0.378	Moderate
F. Overuse	27	I check SNS such as Twitter or Facebook as soon as I wake up.	4.80	0.570	High
	28	I prefer to search for information using a smartphone rather than asking other people.	4.66	0.606	High

29	My smartphone battery does not last a day even after being fully charged.	5.24	0.626	High
30	I use my smartphone longer than I intended.	4.50	0.770	High
31	I feel the urge to use my smartphone as soon as I stop using it.	3.74	0.735	Moderate
32	I have tried several times to reduce smartphone use time, but always fail.	3.76	0.723	Moderate
33	I often think about reducing my smartphone usage time.	3.64	0.686	Moderate
Overall:		4.33	0.203	High
OVERALL (EFFECTS CONSTRUCT):		3.92	0.183	Moderate

The Daily Life Disturbance dimension recorded an overall mean of 3.40 (SD = 0.313) at a moderate level. The most notable impacts were difficulty concentrating in class (mean = 4.34, SD = 0.658) and reduced sleep due to excessive smartphone use (mean = 4.40, SD = 0.606). However, physical effects such as headaches were less prominent (mean = 2.58, SD = 0.641).

The Withdrawal dimension obtained an overall mean of 3.97 (SD = 0.378) indicating a moderate-to-high level reflecting emotional symptoms such as restlessness when not holding a smartphone (mean = 4.34, SD = 0.717) and frequently thinking about the smartphone (mean = 4.40, SD = 0.606). Nevertheless, feeling irritated when interrupted while using the smartphone was low (mean = 2.66, SD = 0.688).

The Overuse dimension recorded the highest overall mean of 4.33 (SD = 0.203) at a high level supported by behaviours such as checking social media immediately upon waking (mean = 4.80, SD = 0.570) and a battery that does not last a day (mean = 5.24, SD = 0.626).

Overall, the effects of smartphone addiction among IPG students are at a moderate level with 98.0 percent of respondents within the moderate range and only 2.0 percent at a high level. The Overuse dimension is the most dominant while physical effects are the least prominent. This indicates that smartphone addiction affects cognitive, emotional and excessive-use aspects more than physical health, underscoring the need for interventions to control excessive use.

4.3. Analysis of the Level of Smartphone Addiction

The analysis indicates that the level of smartphone addiction among IPG students is moderate with an overall mean of 3.72. Approximately 94.0 percent of respondents fell within the moderate range and only 2.0 percent at the high level. No respondents were in the very low or very high categories suggesting a relatively uniform pattern.

At the construct level, the Overuse dimension recorded the highest mean (4.33, SD = 0.203) at a high level, indicating that excessive-use behaviours such as checking social media immediately after waking up are dominant features. The Daily Life Disturbance dimension was moderate (mean = 3.40, SD = 0.313) with the lowest items being physical impacts such as headaches (mean = 2.58, SD = 0.641). Positive Anticipation also stood out (mean = 4.34), suggesting that smartphones provide calmness, enjoyment and excitement that strengthen emotional dependence.

Overall, although the addiction level is moderate, excessive use and emotional gratification remain key drivers. This highlights the need for interventions to regulate smartphone use so that students' life balance is not disrupted.

4.4. Discussion

This discussion explains the study findings based on the research questions drawing on Bronfenbrenner's and Erikson's theories as well as previous studies to understand smartphone addiction among IPG students.

4.4.1. Factors of Smartphone Addiction

The findings identify Positive Anticipation as the main factor, where students use smartphones to reduce stress and seek entertainment consistent with Kwon et al. (2013) and Ching et al. (2020). Within Bronfenbrenner's Ecological Systems Theory, microsystem elements such as academic pressure encourage smartphone use as an escape (Aziz et al., 2021; Olson et al., 2020). The Primacy and Cyberspace-Oriented Relationships dimensions further indicate that online relationships may sometimes replace face-to-face interactions as reported by Zameran et al. (2022) and Huang & Chen (2019).

4.4.2. Effects of Smartphone Addiction

The most pronounced effect is Overuse, where students frequently use smartphones excessively especially for social media aligning with the findings of Fauzi & Mahmood (2024). Daily Life Disturbance was also evident, including concentration problems and fatigue (Liu et al., 2024; Adiba, 2018). Within Erikson's Psychosocial Development Theory, this addiction may disrupt the Intimacy vs. Isolation stage because students tend to interact virtually rather than physically (Wang et al., 2022; Guo, 2019; Shin & Manisah, 2020).

4.4.3. Level of Smartphone Addiction

The overall addiction level is moderate (mean = 3.72) with 98.0 percent of respondents in the moderate range. This aligns with Lim (2019) and Ching et al. (2015), who found that moderate levels are common among higher education students. From an ecological perspective, this reflects a balance between risk and protective factors (Aziz et al., 2021; Zameran et al., 2022). Nonetheless, for students with higher addiction levels, interventions such as digital awareness and time management should be considered.

5. Conclusion

This study aimed to identify the factors, effects and level of smartphone addiction among IPG students in Perak. The results show that the overall addiction level is moderate (mean = 3.72). The primary contributing factor is Positive Anticipation while the most prominent effect is Overuse. The findings also indicate that students rely heavily on smartphones for emotional gratification, entertainment and social media which can impact academic focus and daily life balance.

Overall, the study concludes that smartphone addiction is a significant issue but remains manageable among IPG students with emphasis on excessive use and emotional dependence.

In terms of implications, the Ministry of Education, IPG, schools and the wider community should collaborate to strengthen digital literacy, provide supportive interventions and develop firmer policies to promote balanced technology use. Students are also encouraged to practise self-control and to use smartphones for learning purposes rather than solely for entertainment.

However, this study is limited because it involved only one IPG campus, used purposive sampling, adopted a descriptive design and relied on self-report questionnaires. Future research should involve a broader population and employ longitudinal designs to examine behavioural changes over time, as well as experimental or qualitative approaches to strengthen understanding of contributing factors and more effective interventions.

Ethics Approval and Consent to Participate

Formal ethics committee approval was not required for this study as it involved a low-risk, anonymous survey of adult participants and did not collect sensitive personal data. All procedures performed in this study involving human participants were conducted in accordance with the ethical principles outlined in the Malaysian Code of Responsible Conduct in Research (MOHE, 2018). Informed consent was obtained from all participants prior to their involvement in the study.

Funding

This study received no funding.

Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

References

- Achangwa, C., Ryu, H. S., Lee, J. K., & Jang, J.-D. (2022). Negative effects of smartphone addiction among university students in South Korea: A systematic review. *Healthcare*, 11(1), Article 14. <https://doi.org/10.3390/healthcare11010014>
- Adiba, U. A. (2018). *Motivasi kesukarelawanan dalam kalangan guru pelatih Institut Pendidikan Guru di Sarawak [Volunteerism motivation among teacher trainees at the Institute of Teacher Education in Sarawak]* [Master's thesis, Universiti Pendidikan Sultan Idris]. <http://ir.upsi.edu.my/detailsg.php?det=6561>
- Aziz, S., Raop, N. A., & Shukor, M. F. A. (2021). Pengaruh faktor teknologi maklumat dan komunikasi terhadap kualiti hidup dalam kalangan belia [Influence of information and communication technology factors on quality of life among youth]. *Jurnal Ulwan*, 6(1), 110–126. <https://unimel.edu.my/journal/index.php/JULWAN/article/download/848/676>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press. <https://doi.org/10.4159/9780674028845>
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology* (6th ed., Vol. 1, pp. 793–828). John Wiley & Sons. <https://doi.org/10.1002/9780470147658.chpsy0114>
- Carey, B. (2019, March 22). Can we get better at forgetting? *The New York Times*. <https://www.nytimes.com/2019/03/22/health/memory-forgetting-psychology.html>
- Chen, W. M. (2023). Strategi untuk mengatasi ketagihan telefon pintar dalam kalangan pelajar [Strategies to address smartphone addiction among students]. *Journal of Youth Studies*, 31(5), 215–225. <https://doi.org/10.26914/c.cnkihy.2023.065790>
- Chen, X. D., & Zhang, X. D. (2024). Ketagihan telefon pintar dan kesannya terhadap tekanan akademik: Model perantaraan dimoderasi [Smartphone addiction and its effects on academic stress: A moderated mediation model]. *Journal of Zhaoqing University*, 45(2), 85–95. <http://dianda.cqvip.com/Qikan/Article/Detail?id=7111713167>
- Ching, S. M., Lee, K. W., Ramachandran, V., Sulaiman, W. A. W., Foo, Y. L., Kee, H. C., Yee, A., & Lim, S. M. (2020). The Malay version of smartphone addiction scale: Development, factor structure and validation of a short form for Malaysian adolescents. *Medical Journal of Malaysia*, 75(5), 561–567. <https://doi.org/10.1101/2020.01.06.20016592>
- Ching, S. M., Yee, A., Ramachandran, V., Sazlly Lim, S. M., Wan Sulaiman, W. A., Foo, Y. L., & Hoo, F. K. (2015). Validation of a Malay version of the smartphone addiction scale among medical students in Malaysia. *PLoS ONE*, 10(10), Article e0139337. <https://doi.org/10.1371/journal.pone.0139337>
- Connelly, L. M. (2008). Pilot studies. *Medsurg Nursing*, 17(6), 411–412. <https://pubmed.ncbi.nlm.nih.gov/19248407/>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Sage.
- Din, R., Ahmad, M., KZ, M. F., Sidek, N. M., Karim, A. A., Johar, N. A., Jusoff, K., Zakaria, M. S., Mastor, K. A., & Ariffin, S. R. (2009). Kesahan dan kebolehpercayaan soal selidik gaya e-pembelajaran (eLSE) versi 8.1 menggunakan model pengukuran Rasch [Validity and reliability of the e-learning style questionnaire (eLSE) version 8.1 using the Rasch measurement model]. *Journal of Quality Measurement and Analysis*, 5(2), 15–27. https://www.ukm.my/jqma/v5_2/jqma-5-2-02-rosseni.pdf

- Erikson, E. H. (1950). *Childhood and society*. W. W. Norton & Company. <https://wwnorton.com/books/9780393310689>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Fauzi, I. F. M., & Mahmood, A. I. (2024). Hubungan sikap, pengetahuan dan persepsi terhadap penggunaan gadget di kalangan pelajar di Politeknik Kota Bharu [Relationship among attitudes, knowledge and perceptions toward gadget use among students at Politeknik Kota Bharu]. *Journal of STEM and Education*, 4(1), 104–113. <https://journalstem.net/ojs/index.php/pkb/article/download/journalstem.net/65/264>
- Fernandez, J. (2016). Gender differences in higher education in Malaysia. *Jurnal Pendidikan Malaysia*, 41(2), 12–23. <https://ejournal.ukm.my/jpend/issue/view/878>
- Guo, J. X. (2019). The Influence of Mobile Phone Use Habits on Mobile Phone Dependence : A Case Study of College Students in a Normal University. *Journal of University Studies*, 14(4), 85–95. https://oversea.cnki.net/kcms2/article/abstract?v=W-y7fKBVJCysWqujBLbRDmXyuCSTbyKSmlmgY1rAFIC9lZ3WbG23Talt_fx1AVwnpgCN9KCZACxERZAUhQoX5ihQ0_8acVDeTBefSS4269i27YbE8jnp2LR_5X5kmeNruz6ubtD2p2Y8g4Eu7FxzSZ_VX_NCPshy6j82KE0Bpgk7VJCwwEHBTg==&uniplatform=OVERSEA&language=EN
- Guo, J. X. (2024). Research on College Students' Psychological Stress and Coping Mechanisms in the New Media Environment. *Journal of Family and Educational Studies*, 29(2), 103–118. https://oversea.cnki.net/kcms2/article/abstract?v=W-y7fKBVJCxdok7nz_EiTmGxytfQn1igLSgfpdcKJtGpzh9muBKP9x9_r5dBY6wUues_gxoa33ZV7LNJEVkpQTBih6aN6dleHh2IIU-6HczpJk1yJnRyPdZcnxjdObpBvuGiu2nBtn8RMLUnROMiSPU3A7lv4lReDAiId9s1D9AzatLNfza7g==&uniplatform=OVERSEA&language=EN
- Guo, J. X. (2024). Research on the Relationship between Mobile Phone Dependence and Mental Health of Secondary Vocational School Girls. *Journal of Vocational Education Research*, 20(1), 77–88. <https://doi.org/10.16019/j.cnki.cn42-1578/g4.2024.02.017>
- Hazmi, Z. H. B. Z. (2008). *Keberkesanan pembelajaran dalam talian dan kesannya terhadap kepuasan belajar dan pencapaian pelajar di Institut Pendidikan Guru Malaysia Kampus Ipoh [Effectiveness of online learning and its impact on learning satisfaction and student achievement at the Institute of Teacher Education Malaysia, Ipoh Campus]* [Master's thesis, Universiti Pendidikan Sultan Idris]. https://ir.upsi.edu.my/sw_inc/doc.php?did=2850&id=15772005&t=d
- Hill, R. (1998). What sample size is “enough” in internet survey research? *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*, 6(3–4), 1–12. <https://cadcommunity.pbworks.com/f/what%20sample%20size.pdf>
- Huang, M. Y., & Chen, Y. H. (2019). Investigation and Analysis on the Current Situation of Mobile Phone Used by College Students in Classes——Take Hubei Normal University as an example. *Journal of Educational Research*, 24(8), 190–198. <https://doi.org/10.16400/j.cnki.kjdkx.2019.08.087>
- Ibrahim, R., & Hamdan, F. H. (2023). Isu dan cadangan penggunaan telefon pintar bagi kesejahteraan emosi kanak-kanak masalah pembelajaran: Suatu pandangan ibu bapa [Issues and recommendations on smartphone use for the emotional well-being of children with learning difficulties: Parents' perspectives]. *Jurnal*

- Pendidikan Awal Kanak-kanak Kebangsaan*, 12(2), 13–17. <https://doi.org/10.37134/jpak.vol12.2.2.2023>
- Kementerian Pendidikan Malaysia. (2018). *Garis panduan program ijazah sarjana muda perguruan (PISMP) [Guidelines for the Bachelor of Teaching Degree Programme (PISMP)]*. Bahagian Pendidikan Guru.
- Kementerian Pendidikan Malaysia. (2020). *Statistik pendidikan guru Malaysia [Malaysia teacher education statistics]*. Bahagian Pendidikan Guru.
- Kwon, M., Lee, J.-Y., Won, W.-Y., Park, J.-W., Min, J.-A., Hahn, C., Gu, X., Choi, J.-H., & Kim, D.-J. (2013). Development and validation of a smartphone addiction scale (SAS). *PLoS ONE*, 8(2), Article e56936. <https://doi.org/10.1371/journal.pone.0056936>
- Li, T., & Jin, Y. (2019). Investigation and Analysis on the Current Situation of Mobile Phone Dependence of Contemporary College Students - - Taking Yuxi Normal University as an Example. *Journal of Yanbian Institute of Education*, 33(2), 123–125. https://oversea.cnki.net/kcms2/article/abstract?v=W-y7fKBVJCw_36qX0RXIS2JLOhssEjaoTEhEYcVm2bq24OG6gZioA51BG_P52jOlSvTbUV6t4lt1J9E4SbEhQ7m7rR0almdoAHSF8ereNgqHSNLo-yFzyix--b4nTDT-CtcYvliRXgEUaGNVzXOKinrSqArpwZ9a5TXPcbdQk39Cb65Smvo8DA==&uniplatform=OVERSEA&language=EN
- Li, Y. N., Shao, C. Y., Zhang, S. S., Fan, X. Y., & Liu, Z. (2024). Effects of negative life events on alexithymia in college students: The chain mediating role of mobile phone addiction and insomnia. *China Journal of Health Psychology*. <https://doi.org/10.13342/j.cnki.cjhp.2025.04.005>.
- Lim, P. K. (2019). *Smartphone addiction and depression: Prevalence, sociodemographic factors and its association with severity of depression* [Master's thesis, Universiti Malaya]. Universiti Malaya Students' Repository. https://knova.um.edu.my/student_works_2010s/6100/
- Liu, B. (2024). The Relationship between Parents' Academic Upward Social Comparison and Mobile Phone Dependence in Boarding Primary School Students: The Chain Mediating Role of Academic Self-Handicapping and Learning Boredom. *Journal of Family and Educational Studies*, 29(2), 103–118. <https://doi.org/10.27441/d.cnki.gyzdu.2024.001353>
- Ministry of Higher Education Malaysia (MOHE). (2018). *Malaysian code of responsible conduct in research*. Ministry of Higher Education Malaysia.
- Mukarromah, A., & Andriana, M. (2022). Peranan guru dalam mengembangkan media pembelajaran [Teachers' roles in developing learning media]. *Journal of Science and Education Research*, 1(1), 43–50. <https://doi.org/10.62759/jser.v1i1.7>
- Olson, J. A., Sandra, D. A., Colucci, É. S., Chmoulevitch, D., Nahas, J., Albikaili, A., Raz, A., & Veissière, S. P. L. (2022). Smartphone addiction is increasing across the world: A meta-analysis of 24 countries. *Computers in Human Behavior*, 129, 107138. <https://doi.org/10.1016/j.chb.2021.107138>
- Orenstein, G. A., & Lewis, L. (2022). Erikson's stages of psychosocial development. In *StatPearls*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK556096/>
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (7th ed.). Routledge. <https://doi.org/10.4324/9781003117452>
- Panova, T., & Carbonell, X. (2018). Is smartphone addiction really an addiction? *Journal of Behavioral Addictions*, 7(2), 252–259. <https://doi.org/10.1556/2006.7.2018.49>
- Rahman, N. Q., & Abdullah, H. (2021). Ketagihan telefon pintar dan ketagihan pornografi terhadap kesihatan mental dalam kalangan mahasiswa [Smartphone addiction and pornography addiction and their relationships with students' mental health].

- Jurnal Wacana Sarjana*, 5(1), 1–9.
<https://spaj.ukm.my/jws/index.php/jws/article/view/355>
- Razak, A. F. A., Ghani, M. F. A., & Radzi, N. M. (2024). Amalan kepimpinan guru pelatih Institut Pendidikan Guru Malaysia di Zon Tengah [Leadership practices of IPG trainee teachers in the Central Zone]. *JuPiDi: Jurnal Kepimpinan Pendidikan*, 11(2), 35–51. <https://doi.org/10.22452/jupidi.vol11no2.3>
- Roscoe, J. T. (1975). *Fundamental research statistics for the behavioral sciences* (2nd ed.). Holt, Rinehart and Winston. <https://search.worldcat.org/title/Fundamental-research-statistics-for-the-behavioral-sciences/oclc/995197>
- Shin, T. L., & Manisah, M. A. (2020). Kesan nomofobia terhadap estim sendiri dalam kalangan pelajar berkeperluan khas [Effects of nomophobia on self-esteem among students with special needs]. *Akademika*, 90(3(SI)), 131–143. <https://journalarticle.ukm.my/17326/>
- Tan, J. J. (2024). An Empirical Study on the Impact of Different Smartphone Restriction Strategies on Sleep and Academic Performance of Vocational School Students. *Journal of Educational Technology Studies*, 12(3), 23–35. <https://doi.org/10.27005/d.cnki.gdzku.2024.001213>.
- Wang, J. C., Hsieh, C. Y., & Kung, S. H. (2023). The impact of smartphone use on learning effectiveness: A case study of primary school students. *Education and Information Technologies*, 28, 6287–6320. <https://doi.org/10.1007/s10639-022-11430-9>
- Yuan, W., & Ma, L. (2024). Influence of mobile phone addiction on learning burnout of preschool education students in higher vocational colleges: the mediation of core self-evaluation. *Journal of Campus Life & Mental Health*, 22(1), 32–39. <https://doi.org/10.19521/j.cnki.1673-1662.2024.01.006>.
- Zameran, F. A., Nawil, A., Yusof, M. R., & Mat Ali, N. A. (2022). Meneroka hubungan penggunaan telefon pintar terhadap kesejahteraan remaja: Kajian literatur sistematik [Exploring the relationship between smartphone use and adolescent well-being: A systematic literature review]. *International Journal of Education, Psychology and Counselling*, 7(46), 262–275. <https://doi.org/10.35631/IJEPC.746021>