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# The Developing and Validating an Instructional Model for Optimal Smartphone Use Among Sri Lankan Advanced Level Adolescents: A Mixed-Methods Study.

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**ABSTRACT**

**Introduction**: The increasing prevalence of smartphone addiction among adolescents poses a significant challenge to academic performance and psychological well-being. In Sri Lanka, where Advanced Level (A/L) students face intense academic pressure, unregulated smartphone use is a growing concern.

**Objectives**: This study aimed to develop, validate, and evaluate an instructional model to promote responsible smartphone use among Sri Lankan A/L students.

**Methods**: A three-phase mixed-methods approach was employed. Phase I involved a survey of 506 students from 1AB schools in the Colombo Education Zone using the Short Version of the Smartphone Addiction Scale (SV-SAS) along with a prepared questionnaire to assess addiction and its correlates. Phase II focused on expert validation of the instructional model, incorporating feedback from 22 professionals across 11 relevant fields. In Phase III, a four-week intervention was conducted with eight addicted students to test the content validated model's effectiveness, with pre and post intervention SV-SAS scores statistically analyzed using paired samples t-tests.

**Results**:Post-intervention results showed a significant reduction in smartphone addiction (mean SV-SAS score decreased from 36.38 to 20.38; $p = 0.001$). All students moved from the "addicted" to "not addicted" category. The average reduction in addiction scores was 58.73%. Students reported high adherence (mean 88.8%) and rated the model effective in improving their smartphone habits and academic focus.

**Conclusions**: The instructional model proved effective in mitigating smartphone addiction and fostering healthier digital habits among Sri Lankan A/L students. The findings underscore the model's potential for broader application in educational and public health interventions targeting adolescent smartphone use.

**Keywords:** Smartphone addiction, Sri Lankan Advanced Level students, Instructional Model, Intervention

## INTRODUCTION

The widespread adoption of smartphones has transformed the educational landscape, particularly among adolescents. While these devices offer unparalleled access to knowledge, communication, and learning tools, their excessive and unregulated use has been increasingly linked to problematic behaviors, psychological distress, and academic underachievement ( Kuss & Griffiths,2017 and Samaha & Hawi, 2016). In Sri Lanka, smartphone usage has surged: by the fourth quarter of 2024, there were over 20.6 million mobile broadband subscriptions and a cellular mobile density of 131.5 per 100 inhabitants—meaning mobile connections now exceed the total population ( Telecommunication Regulatory Commission of Sri Lanka, 2025). Such ubiquity places Advanced Level (A/L)

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students—who are preparing for one of the nation's most competitive, high-stakes examinations—at heightened risk of excessive use and addiction, which have been shown to undermine concentration, disrupt sleep patterns, and correlate with lower academic performance ( Kuss & Griffiths,2017 and Samaha & Hawi, 2016).

Admission to public universities in Sri Lanka is highly competitive. In 2023, for instance, out of approximately 41,000 students who sat for the Bio Science stream, only about 2,000 secured places in state medical faculties. Similarly, about 1,700 Physical Science stream students were admitted to engineering faculties, while smaller numbers gained admission to other highly demanded fields such as law, veterinary science, dentistry, and management ( University Grants Commission of Sri Lanka, 2023). As such, there is an urgent need to address how smartphones can be integrated into the academic lives of adolescents in a balanced and productive manner, particularly within the Sri Lankan educational and sociocultural context.

Numerous international studies have documented the negative effects of unregulated smartphone use on adolescents' academic performance and mental health (Aljomaa et.al, 2016 and Chen et.al, 2017). In Sri Lanka, emerging research echoes these findings. Karunanayake et al. reported that over 30% of adolescents in selected schools in Piliyandala met the criteria for smartphone addiction, with reported impacts on physical activity, sleep quality, and classroom engagement . A study conducted in the North Central Province identified perceived usefulness, loneliness, and family income level as key predictors of addiction risk among schoolchildren (Wickramasinghe and Weerakkody, 2021). Herath and Wanasinghe observed that although students used smartphones for learning, only about 40% of total screen time was allocated to academic purposes, with the rest dominated by entertainment and social communication.

In the Sri Lankan context, the need for such guidance is especially critical. As mentioned previously, A/L students face immense academic pressure, often preparing for years for a single examination that determines free university admission. The COVID-19 pandemic further complicated this scenario, as online learning became a necessity and significantly increased students' dependence on digital devices. While smartphones emerged as an accessible alternative to computers for online classes, they also contributed to rising levels of distraction, poor sleep hygiene, social withdrawal, and emotional instability among students (Ministry of Education, Sri Lanka, 2021). Despite the evident impact of smartphone use on student outcomes, there is a scarcity of empirical studies in Sri Lanka that explore this phenomenon in depth or provide structured interventions to mitigate the adverse effects.

The present study is structured into three distinct phases, with the ultimate goal of developing an instructional model to guide responsible smartphone use among Sri Lankan Advanced Level students. Phase I focused on identifying usage patterns and emerging trends by surveying 506 students from 1AB schools in the Colombo Education Zone. Of the participants, 33% were identified as addicted to smartphones using the Short Version of the Smartphone Addiction Scale (SV-SAS), with gender-specific cutoff scores of ≥31 for males and ≥33 for females.The analysis revealed several statistically significant relationships between smartphone addiction and a range of variables. Addiction levels were notably higher among males (38.4%) compared to females (26.3%). Daily smartphone usage showed a clear upward trend in addiction, with rates increasing progressively with longer use. Using smartphones close to bedtime was also linked to higher addiction, peaking at 55% among those who used phones until falling asleep. Students who primarily used smartphones for entertainment (43.2%) and social communication (38%) had significantly higher addiction rates than those who used them for educational or research purposes. A strong association was observed between addiction and lower self-reported academic achievement, as well as negative self-perceived impact on education. Additionally, significant relationships were found with current living arrangements, checking smartphones first thing in the morning, frequent time spent alone at home with the phone, and lower levels of attachment to parents, siblings, and peer groups. These findings formed the empirical foundation for developing the student-friendly instructional model in Phase II.

Importantly, the instructional model proposed in this study was not developed in isolation. To ensure its interdisciplinary rigor, contextual appropriateness, and practical applicability, it underwent a structured expert validation process. The review and evaluation process of the model's structure and recommendations were done by a committee of 22 professionals from 11 key domains consisting of psychiatry, psychology, education, child development, and safeguarding. The fundamental principles such as limiting daily screen time and promoting equitable, purposeful smartphone use were the affirmed results of the overall feedback given by the above -

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mentioned professionals. Further, the amalgamation of the suggestions on certain application strategies as student autonomy within the boundaries and time management techniques was assured during the study. Hence, the final model of the study showcased a combination of evidence – based and contextually appropriate structure which was aimed at the necessities and actualities of the Sri Lankan Advanced Level students.

After the expert evaluation, a small-scale intervention was done integrating several students identified as at being risk of smartphone addiction to test the applicability of the model. After the attentive implementation of the model over a designated time has shown a significant development in participants' academic commitment, psychological well – being and self- discipline. Thus, this three – phase structured study which involves an extensive data collection, expert – supervised model and real – life implementation depicts a pragmatic and contextualized approach to diminish smartphone addiction and develops effective digital consumption habits among adolescents.

## METHODS

The issues identified in the first phase of the study were addressed by initiating an instructional model to foster effective and responsible smartphone use among Sri Lankan Advanced Level (A/L) students. The basic draft of the model was designed and verified under expert consultation. A committee containing 22 industrial practitioners from 11 various fields of studies were invited for this purpose. They were Consultant Child and Adolescent Psychiatrists, Consultant Psychiatrists, Consultant Community Physicians, Clinical Psychologists, Psychological Counsellors, Child Safeguarding Officers, Education Policy Makers, University Academics, Secondary School Heads, Secondary School Teachers, and Special Educationalists whose contribution was significantly effective for the results of the study. A structured Google Form was used to collect their feedback on the model's relevance, clarity, and feasibility. Their comments and suggestions were analyzed and incorporated into the final version of the model, which consisted of 11 practical focus areas : managing social media use, managing messaging and communication apps, Managing Calls, Managing Smartphone use around sleep, Exposure to Pornographic Content, Responsible Gaming Practices, Physical Health and Posture, Non- screen Time and Smartphone Free Sessions, Mindful Use of Music and Video Content, Privacy and Online Safety, Safety and Well being in Smartphone Use.

Following this, an intervention study was conducted to evaluate the effectiveness of the refined instructional model. A leading 1AB national boys' school in the Colombo Education Zone was selected for the intervention. Forty Advanced Level students aged 17, from the Biological Science and Physical Science streams, were randomly chosen. Each student completed the Short Version of the Smartphone Addiction Scale (SV-SAS) and a participant information form. They were informed that participation in the intervention would be voluntary and subject to three criteria: a score of 31 or above on the SV-SAS indicating smartphone addiction, ownership of a smartphone, and written parental consent.

A total of eight Advanced Level students, labeled Students A to H, participated in the intervention. Their academic streams and current living arrangements were as follows: Students A, B, C, E, F, G, and H were from the Physical Science stream, while Student D was from the Biological Science stream. In terms of living arrangements, five students (B, C, E, F, and G) lived with both parents, two students (A and D) lived with a single parent, and one student (H) resided with a guardian.

The intervention lasted for four weeks. Each participant received the finalized instructional model and was guided through its sections. Progress was monitored weekly through Zoom meetings and a self-report sheet where students rated their adherence to each component of the model on a five-point scale and documented challenges encountered. At the end of the four weeks, the SV-SAS was re-administered to all participants to measure changes in smartphone addiction levels. Additionally, a structured feedback form was used to gather participants' views on the model's usefulness, effectiveness, and areas for improvement.

Ethical approval for this study was obtained from the Ethical Review Committee of the Open University of Sri Lanka (Reference Number : ER/2023/031). Permissions were also granted by the Zonal Education Office and the principal of the selected school. Informed consent was obtained from both the students and their parents. All data were collected confidentially and used solely for research purposes. Statistical analysis was conducted using SPSS version 26 to compare pre and post intervention smartphone addiction scores, and the significance of the observed changes was evaluated using appropriate inferential statistical tests.

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The content of the instructional model used for the intervention is provided in the figure 1. However, the original version was presented to students as a visually engaging, full-colour document designed using professional graphic design elements.

Figure 1 : Instructional Model for Effective Smartphone Use

**Summary of Instructional Model for Effective Smartphone Use**

(Enhancing education and promoting psychological well - being; guiding A/L students towards responsible and purposeful smartphone usage)

**(1) Managing social media**

- Disable social media notifications to avoid distraction.
- Use a minimum number of platforms (preferably one).
- Set specific times for social media use.

  E.g: Study breaks, meal breaks, after completing school work
- Evaluate and adjust social media habits to avoid interference with academics or personal goals.
- Use app timers to limit daily usage.

**(2) Managing messaging and communication apps**

- Limits number of groups your actively participate.
- Leave or inactive unnecessary groups regularly.
- Turn off notifications for non-essential apps.
- Use do not disturb mode during study time and sleeping.
- Check messages only at specific times.
- Avoid replying during study hours and late night.

**(3) Managing calls**

- Return missed calls after study sessions.
- Keep your phone "Silent" or "Do not disturb" mode during classes or study time.
- Keep conversation brief.

**(4) Managing smartphone use around sleep**

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- To keep the alarm, use a traditional alarm clock instead of phone.
- Enable night mode or blue light filters, if you are compelled to use a smartphone until just before bed.
- Do not keep your phone on the bed while sleeping.
- Read a book, meditate or engage in other non-screen related relaxation techniques before bed.
- Avoid screen at least 30 minutes before sleeping.

**(5) Exposure to pornographic content**

- Handle stress or loneliness with hobbies, talking to friends, physical exercise.
- Keep it in mind these portrayals do not reflect real relationships and intimacy.
- Understand that porn movies are dramatized and unrealistic.
- Caution !Pornography is highly addictive. Protect your well - being and mental health.

**(6) Responsible gaming practices**

- Beware ! Games can be addictive, especially those designed for long play.
- Try your best to choose non-screen based activities instead of gaming.
- Set strict time limits on gaming and monitor your emotional response after gaming sessions.

**(7) Physical health and posture**

- Hold your phone at eye level or use a stand to avoid neck strain.
- Use a laptop or desktop for long tasks to reduce eye strain and improve posture.
- Follow the 20-20-20 rule. Every 20 minutes look 20 feet away for 20 seconds to ease eye strain.

**(8) Non-screen time and smartphone free sessions**

- Limit phone use in religious or social events. Use only when essential.
- Create smartphone free zones.

  E.g: Study areas, dining room•
- Spend at least an hour daily on non-screen activities like reading and exercise.

**(9) Mindful use of music and video content**

- Limit music and video use a to short sessions under 30 minutes on study days.
- Prefer "Audio only" option to reduce screen time.
- When listening to music during study breaks or while studying, select low simulation instrumental music.

**(10) Privacy and Online Safety**

- Don't share personal details such as location, contact details.
- Adjust privacy settings to secure your information.

**(11) Privacy and Online Safety**

- Avoid using smartphones while walking, crossing roads.
- Never take photos in risky places like near roads or water.
- Seek help from trusted adult if smartphone use affects your focus or mental health.

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## RESULTS

This section presents the outcomes of the four-week intervention that applied the instructional model aimed at promoting responsible and educational smartphone use among Sri Lankan Advanced Level students. Eight students (labeled A to H) participated in the study. Data were gathered through weekly adherence tracking, the Short Version of the Smartphone Addiction Scale (SV-SAS) administered before and after the intervention, and a post-intervention feedback questionnaire.

Each participant recorded their adherence to the 11 focus areas of the instructional model over four weeks. Adherence was rated on a five-point Likert scale, where 1 indicated poor follow-up and 5 indicated excellent adherence. As shown in Table 1, the average adherence scores across focus areas were generally high. The highest adherence was observed in Managing Calls (M = 4.84, 96.8%), Safety and Well-being in Smartphone Use (M = 4.78, 95.6%), and Responsible Gaming Practices (M = 4.72, 94.4%). The lowest adherence was reported in Managing Social Media Use (M = 3.78, 75.6%), indicating this was relatively more challenging for students.

Table 1: Average Adherence Score for Each Focus Area of the Instructional Model

| Focus Area | Average Adherence Score | Adherence Percentage |
|---|---|---|
| Managing Social Media Use | 3.78 | 75.6 |
| Managing messaging and communication apps | 4.19 | 83.8 |
| Managing Calls | 4.84 | 96.8 |
| Managing smartphone use around sleep | 4.16 | 83.2 |
| Exposure to pornographic content | 4.68 | 93.6 |
| Responsible gaming practices | 4.72 | 94.4 |
| Physical health and posture | 4.38 | 87.6 |
| Non- screen time and smartphone free sessions | 4.44 | 88.8 |
| Mindful use of music and video content | 4.24 | 84.8 |
| Privacy and online safety | 4.66 | 93.2 |
| Safety and well being in smartphone use | 4.78 | 95.6 |

As reflected in Table 2, overall adherence percentages per student ranged from 82.6% (Student H) to 95.4% (Student A), with an overall mean adherence rate of 88.8%, reflecting strong engagement with the model.

Table 2: Overall Average Adherence Score and Adherence Percentage of Each Participant Across 11 Focus Areas

| Student | Overall Average Adherence Score | Adherence Percentage |
|---|---|---|
| A | 4.77 | 95.4 |
| B | 4.30 | 86.1 |
| C | 4.57 | 91.4 |
| D | 4.16 | 83.2 |
| E | 4.39 | 87.8 |
| F | 4.55 | 91.0 |
| G | 4.65 | 93.0 |
| H | 4.13 | 82.6 |

All students rated the instructional model 4 out of 5 on its overall effectiveness and reported positive behavioral changes in their smartphone habits after the intervention . Students were allowed to select multiple options when asked about the most helpful focus areas. The most frequently cited areas were Managing Social Media

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Use and Managing Smartphone Use Around Sleep (both selected by 75% of participants), followed by Exposure to Pornographic Content, Physical Health and Posture, and Non-screen Time and Smartphone-free Sessions (each 50%) as shown in Table 3. Notably, all students also indicated they would recommend the instructional model to peers.

Table 3: Most Helpful Focus Areas Identified by Students (Multiple Responses Allowed)

| Focus Area | Number of students who selected | Percentage of total participants |
|---|---|---|
| Managing Social Media Use | 6 | 75.0 |
| Managing messaging and communication apps | 1 | 12.5 |
| Managing Calls | 1 | 12.5 |
| Managing smartphone use around sleep | 6 | 75.0 |
| Exposure to pornographic content | 4 | 50.0 |
| Responsible gaming practices | 3 | 37.5 |
| Physical health and posture | 4 | 50.0 |
| Non- screen time and smartphone free sessions | 4 | 50.0 |
| Mindful use of music and video content | 2 | 25.0 |
| Privacy and online safety | 1 | 12.5 |
| Safety and well being in smartphone use | 2 | 25.0 |

In addition to the quantitative ratings, students' weekly reflections and final feedback provided valuable qualitative insights into their behavioral adaptations during the intervention. As shown in Table 4, these responses were thematically analyzed and organized under the instructional model's 11 focused areas.

Table 4 : Representative Student Reflections on Thematic Focus Area

| Thematic Focus Area | Representative Student Comment |
|---|---|
| Managing Social Media Use | Struggled with short videos and social pressure to stay updated. |
| Managing Messaging Apps | Started allocating fixed slots for messaging, reducing anxiety. |
| Managing Calls | Realized many calls weren't essential—reduced unnecessary communication. |
| Smartphone Use Around Sleep | Developed bedtime discipline; replaced phone use with reading. |
| Exposure to Pornographic Content | Avoided explicit content despite temptation across platforms. |
| Responsible Gaming Practices | Stopped multiplayer gaming; replaced it with short, mindful entertainment. |
| Physical Health and Posture | Began avoiding comfort zones that triggered screen time. |
| Non-screen Time and Smartphone-free Sessions | Took breaks more often and felt more focused after digital detox sessions. |

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| | |
|---|---|
| Mindful Use of Music and Video Content | Reduced music usage during study, improving concentration. |
| Privacy and Online Safety | Improved digital safety settings and awareness of online privacy. |
| Overall Reflections and Perceived Benefits | Felt more confident, focused, and less emotionally dependent on the phone. |

A recurrent theme was the struggle to manage social media usage, particularly in resisting the urge to engage with short video content and messaging apps. Students commonly reported feelings of anxiety and a fear of missing out (FOMO), especially in the initial weeks. For instance, one student remarked that "scrolling through short videos didn't feel like time was passing," highlighting the deceptive nature of such content in extending screen time. However, as the weeks progressed, many demonstrated adaptive behaviors, such as reducing app usage, activating screen timers, and adopting mindful scrolling practices. A student shared, "It was hard to stay away from Instagram, but I started noticing when I was scrolling without reason."

A noticeable development was recognized under the focused area of managing the messaging of communication apps. A significant change from addiction to balanced use of these apps could be observed after following this instructional model. One participant stated, "By the third week, I had started allocating specific time slots – morning, afternoon, and evening – for checking messages." highlighting the above idea. Most of the other participants also highlighted this shift of the mindset as they have identified many conversations were not essential which helped them to avoid excessive texting.

Most students reflected their performance depicting trivial issues regarding call management whereas a few showcased their emerging concern highlighting that minimizing call might affect their relationships. One student declared, "At first, I feared weakening friendships, but eventually realized most calls weren't important. It felt peaceful."

Another vital area of transformation evolved through the findings was the smartphone usage around sleep. The nighttime phone use of some students was alternated with reading or early preparation for bed. For instance, a student who initially faced difficulties using YouTube before sleep gradually developed the habit of disconnecting 30 minutes before bedtime. One of the students stated, "By the end, I could sleep without even touching the phone because there wasn't much to interact with."

A notable self – control and motivation were indicated in relation to the exposure of pornographic content. A student stated, "even though tempting material appeared across entertainment apps, my no - pornography streak kept me motivated." Some other students assured the challenges, yet they desired to not to reveal the relevant experiences, depicting a degree of sensitivity around the topic.

Responsible gaming practise was also a vital area developed under the influence of this model. A student reflected, "I deleted a game halfway through and realized it was just wasting my time. Even though I regretted it briefly, I didn't reinstall it." Some other students substituted short, passive entertainment or offline activities with gaming.

The enhanced awareness of physical health and posture was another area that the students showcased. Correction of sitting positions were followed by some students whereas the others were engaged in scheduled workouts to avoid the "comfort zones". One student stated, "Avoiding my usual study chair helped me avoid the phone – and I even fell asleep without meaning to."

Any distress could not be identified in non – screen time and smartphone – free sessions as it was viewed positively. A student declared that "people thought I was ignoring them, but once I explained my limited phone time, it got better." Students highlighted the developed focus, optimized time efficiency, and elevated physical activity participation.

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Under the criteria of mindful use of music and video content, it was challenging to avoid music during study sessions for some students. However, a shift could be seen later where the students limited the usage to non – academic periods and listening to informative content. One student reflected, "Listening to music became restrictive at first, but I managed to replace it with other forms of relaxation."

A recognized awareness of the privacy & online safety and safety & well being in smartphone use could also be observed via the findings. Many students were aware of the physical dangers as using phones while walking after they updated their privacy setting and restricting app permissions. One of the students mentioned, "I started hiding my status from third parties and became more conscious about not using the phone in risky areas."

In their overall feedback, students consistently noted improvements in focus, emotional regulation, and time management. One student commented, "My phone use dropped by several hours, which helped me concentrate more on studies." Another expressed, "I became more confident, less angry, and even more willing to engage with others in person."

These qualitative outcomes strongly affirm the impact of the instructional model in promoting more disciplined, mindful, and educationally supportive smartphone behaviors.

Pre and post intervention SV-SAS scores are summarized in Table 5. All eight students were classified as "addicted" before the intervention, with scores ranging from 31 to 45. After the intervention, all students fell below the addiction threshold, with scores between 13 and 26, indicating successful outcomes for each participant.

Table 5 : Pre- and Post-Intervention SV-SAS Scores and Addiction Status of Participants

| Student | SV-SAS Score Prior to the Intervention | Addiction Status Prior to the Intervention | SV-SAS Post Intervention | Addiction Status Post Intervention |
|---|---|---|---|---|
| A | 35 | Addicted | 23 | Not Addicted |
| B | 33 | Addicted | 26 | Not Addicted |
| C | 43 | Addicted | 25 | Not Addicted |
| D | 45 | Addicted | 13 | Not Addicted |
| E | 31 | Addicted | 22 | Not Addicted |
| F | 31 | Addicted | 17 | Not Addicted |
| G | 38 | Addicted | 19 | Not Addicted |
| H | 35 | Addicted | 18 | Not Addicted |

The percentage reduction in SV-SAS scores (Table 5) ranged from 30.43% (Student B) to 91.43% (Student D), with an average reduction of approximately 58.73% across all participants.

Table 6 : Percentage Reduction in SV-SAS Scores Following the Intervention

| **Student** | **Percentage Reduction** |
|---|---|
| A | 48.00 |
| B | 30.43 |
| C | 54.55 |
| D | 91.43 |
| E | 42.86 |
| F | 66.67 |
| G | 67.86 |
| H | 68.00 |

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To assess the statistical significance of the change in SV-SAS scores, a paired samples t-test was conducted. The mean SV-SAS score decreased from 36.38 (SD = 5.26) before the intervention to 20.38 (SD = 4.41) after the intervention, with a mean difference of 16.00. The t-test yielded a t-value of 5.842 with 7 degrees of freedom and a p-value of 0.001, which is statistically significant at the $\alpha = 0.05$ level. The 95% confidence interval for the difference ranged from 9.52 to 22.47, confirming that the decrease was not due to chance.

In addition, a one-sided hypothesis test was conducted to determine whether the true mean reduction in SV-SAS scores was greater than 10. This hypothesis was selected because the minimum possible SV-SAS score is 10, and a reduction greater than 10 would indicate a practically meaningful shift away from addiction-level usage. The test resulted in a t-value of 2.19 and a p-value of 0.032, allowing rejection of the null hypothesis ($H_0$: $\mu_{difference} = 10$) and supporting the conclusion that the observed reduction was not only statistically significant but also educationally and clinically relevant.

## DISCUSSION

The findings of this mixed-method intervention study demonstrate that the implementation of a structured instructional model can significantly reduce smartphone addiction levels among Sri Lankan Advanced Level (A/L) students, while promoting healthier digital habits and academic focus. The statistically significant decline in SV-SAS scores from a pre intervention mean of 36.38 to a post-intervention mean of 20.38 ($p = 0.001$)—provides compelling evidence of the model's effectiveness. Moreover, the average percentage reduction of 58.73% in addiction scores among participants further affirms the clinical and educational relevance of the intervention.

These results align with previous research that underscores the negative consequences of unregulated smartphone use among adolescents, including poor academic performance, sleep disturbances, and increased stress levels (Kuss & Griffiths,2017 and Samaha & Hawi, 2016, Aljomaa et.al, 2016). The present study builds upon such findings by offering a practical, culturally appropriate, and empirically tested model to address these concerns. It also extends existing knowledge by demonstrating that even a short-term, student-centered intervention can yield significant behavioral improvements when tailored to the specific needs and realities of students.

One of the most noteworthy outcomes was the universal reduction in addiction classification—where all eight participants transitioned from being classified as “addicted” to “not addicted” post-intervention. The fact that Student D, who initially had the highest SV-SAS score (45), exhibited a 91.43% reduction suggests the model’s potential for substantial impact even in severe cases. Additionally, the hypothesis that the true mean reduction would exceed 10 was supported ($p = 0.032$), validating the intervention’s practical significance beyond statistical thresholds.

Students’ adherence to the model was consistently high, with an average compliance rate of 88.8%. This suggests that the model was not only theoretically sound but also feasible for real-world application. However, adherence varied slightly across focus areas. For instance, while areas such as “Managing Calls” and “Safety and Well-being in Smartphone Use” received adherence scores above 95%, “Managing Social Media Use” scored the lowest (75.6%). This discrepancy reveals that social media remains a particularly challenging domain for adolescents to self-regulate—an observation echoed in global literature (Chen et.al, 2017). This insight may inform the need for more targeted strategies or deeper psycho education on the compulsive nature of social media use in future iterations of the model.

The thematic analysis of student reflections reveals a multifaceted transformation in smartphone usage behaviors, underscoring the efficacy of the instructional model. These qualitative results not only support the quantitative improvements recorded during the intervention but also provide deeper insight into the psychological and behavioral mechanisms involved.

From a theoretical perspective, many observed changes align with principles of self-regulation and habit formation. Students who initially struggled with uncontrolled screen time gradually adopted structured approaches—such as using app timers, assigning time slots for messaging, and minimizing use before bedtime. This mirrors findings from prior studies that emphasize goal-setting, environmental restructuring, and feedback as key strategies for digital self-regulation (Panova & Carbonell, 2018).

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Moreover, the data points to a notable reduction in FOMO and smartphone- related anxiety, particularly in the domains of social media and messaging. The reduction of the anxiety levels of the students who accustomed to be addicted to messages and constant updates through apps is a remarkable result from the study as it shows the transformation from external control (i.e., social validation) to internal regulation (sustainable digital wellness). The above result complies with the findings of the study by Samaha and Hawi (2016), that problematic smartphone usage often associates with psychological distress, including anxiety and depression.

In addition, the improved academic concentration was another significant result from the study where students have reported more productive days and optimized time management after the minimized usage of screen time. This finding is further supported with the study by Lepp et al. (2014), which denotes the idea that decreased smartphone use aligns with enhanced academic focus.

A noticeable recognition of the positive impact of social and emotional development was perceived through the intervention. As per the feedback of the students, it has paved the way to better interpersonal relationships, emotional stability, and confidence. For instance, one student identified a remarkable transformation in reduction in anger and enhanced preference to associate with peers. The above results conclude that excessive smartphone use may develop psychological and cognitive resources which were restricted by digital engagement prior.

Nevertheless, several limitations were unfolded. One student depicts the lack of motivational help to discuss ingrained dependencies though this model provides practical solutions. This showcases the need of incorporation motivational enhanced components, possibly drawing from self- determination theory- which denotes sustained behavior change depends on autonomy, competence, and relatedness (Deci & Ryan, 2000). The significance of external performance review was pointed by another student, implying the idea that, “without proper supervision, students may not adhere to the model.” This depicts the necessity of measuring the intervention through school – level or community-based applications which aligns with parental guidance or mentor-ship for long – lasting outcomes.

A qualitative amplification for the quantitative data was collected through the self- reported feedback. The effectiveness of the model and depiction of remarkable behavioral developments were rated by all the participants. “Managing Media Use” and “Managing Smartphone Use Around Sleep” were selected as the most common advantageous areas. This demonstrates the students’ identification of the above areas as fundamental for their academic advancements and mental well – being. The preference of all the participants to recommend the model to their peers further assures the reliability and utility of this model.

The interdisciplinary validation was a significant fact that assisted the development of this model. Especially, the expertise feedback from the fields of psychiatry, psychology, education, child development, and safeguarding holistic and integrity – based approach. This cooperative process connects theory with practice underlining the model as not only evidence – based but also contextually relevant in relation to the Sri Lankan secondary education sector.

Despite these promising findings, several limitations should be acknowledged. First, the intervention sample was small (n = 8), drawn from a single boys’ school in Colombo. While the controlled nature of the study enabled close monitoring and evaluation, the generalizability of results remains limited. Future studies should expand the sample size, include female students, and encompass a wider geographic range to better assess the model's scalability. Second, the four-week duration, although sufficient to demonstrate short-term gains, does not allow for evaluation of long-term sustainability. Longitudinal studies are needed to examine whether improvements in smartphone use and academic behaviors are maintained over time.

In conclusion, the study demonstrates that a culturally grounded, expert-validated instructional model can significantly reduce smartphone addiction and foster more productive smartphone habits among Sri Lankan A/L students. By integrating behavioral self-monitoring, weekly feedback, and practical focus areas, the intervention empowered students to self-regulate and align their smartphone use with academic and personal well-being goals. The promising outcomes warrant further testing at scale and suggest that such interventions could play a critical role in broader educational and public health strategies aimed at digital wellness in adolescent populations.

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## CONCLUSION

This study demonstrates the trans-formative potential of a structured, culturally grounded instructional model in addressing smartphone addiction among Sri Lankan Advanced Level (A/L) students. Through a three-phase mixed-methods approach—spanning large-scale data collection, expert validation, and real-world intervention—the model successfully guided students toward healthier smartphone habits and enhanced academic focus. The intervention yielded a statistically significant and educationally meaningful reduction in smartphone addiction, with all participants transitioning from "addicted" to "not addicted" status. High adherence rates and positive feedback further underscored the model's feasibility and acceptability. While the small sample size limits generalizability, the promising results highlight the need for broader implementation and long-term evaluation. This model offers a viable framework for educational and public health stakeholders aiming to foster digital well-being among adolescents in an increasingly connected world.

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## REFRENCES

[1]. Aljomaa, M., Qudah, S., Albursan, M., Bakhiet, M., & Abduljabbar, M. (2016). Smartphone addiction among university students in the light of some variables. *Computers in Human Behavior*, 61, 155– 164. https://doi.org/10.1016/j.chb.2016.03.041

[2]. Chen, B., Liu, F., Ding, S., Ying, X., Wang, L., & Wen, Y. (2017). Gender differences in factors associated with smartphone addiction: A cross-sectional study among medical college students. *BMC Psychiatry*, 17, Article https://doi.org/10.1186/s12888-017-1503-z

[3]. Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits:Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

[4]. Herath, N., & Wanasinghe, R. (2023). The impact of mobile phone usage patterns on academic performance of A/L students in Colombo. *International Journal of Education and Research*, 11(1), 33–42.

[5]. Karunanayake, D., Madushani, R., & Weerasinghe, M. R. (2020). Smartphone addiction and its impact on adolescents in selected schools in Piliyandala. Sri Lanka *Journal of Child Health*, 49(3), 256–260.

[6]. Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health,* 14(3), 311. https://doi.org/10.3390/ijerph14030311

[7]. Lepp, A., Barkley, J. E., & Karpinski, A. C. (2014). The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students. *Computers in Human Behavior*, 31, 343–350.

[8]. Ministry of Education, Sri Lanka. (2021). Annual report on distance learning and technology integration. https://moe.gov.lk

[9]. 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

[10].Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior*, 57, 321–325. https://doi.org/10.1016/j.chb.2015.12.045

**Journal of Information Systems Engineering and Management**
2025, 10(56s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

**Research Article**

[11].Telecommunications Regulatory Commission of Sri Lanka. (2025). Telecommunications statistics – Q4,2024. https://www.trc.gov.lk/content/files/statistics/TSR2024Q4TelecommunicationsStatisticalreport28012025forwebupdatea.pdf

[10]. University Grants Commission of Sri Lanka. (2023). Admission handbook 2023/2024 – University statistics. UGC, Colombo.

[11].Weerasinghe, S. R., Vivekanandam, B., & Herath, C. (2025). The extent of smartphone addiction and its impact on educational outcomes among Sri Lankan Advanced Level students in the adolescence stage. *Journal of Information Systems Engineering and Management*, 10(41s), 586–597. https://www.jisem-journal.com/index.php/journal/article/view/7977/3642

[12].Wickramasinghe, M., & Weerakkody, K. (2021). Influence of smartphone use on schoolchildren in the North Central Province of Sri Lanka. *Journal of Social Sciences and Humanities,* 4(1), 15–22.