SMART PHONE ADDICTION: ENHANCED OR DIMINISH META COGNITIVE SKILL IN PUPIL

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Abstract

Technology is now days as important as other daily routine in life. When technology comes in existence it is used in supportive way but now, we depend on technology. Use of technology start with computer then landline after that cell phones and now smartphone. Smartphone addiction, a modern behavioral disorder, is characterized by compulsive overuse of mobile devices and measured by frequency of access or total screen time. While smartphones can enhance teaching and learning in higher education, their excessive use poses significant risks to students' mental health and academic performance. The constant urge to check devices can lead to reduced concentration, impaired memory, and diminished critical thinking skills. As smartphones become increasingly integrated into student life, educational institutions face the challenge of balancing their benefits with the need to promote healthy usage habits and protect students' well-being. Therefore, researcher want to know is pupil teacher also have smartphone addiction. If yes then how smartphone addiction effect on their meta-cognitive skill which is about their skill related to teaching. It shows that smartphones have a significant impact on the metacognitive skills of pupil teachers.

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Key word: smart phone addiction and meta-cognitive skill.

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Introduction

In recent years, mobile phones have seen an unprecedented adoption among young people. They have become an essential component of teenagers' daily routines and stand as the primary mode of electronic communication for many. Transitioning from a mere technological tool to a social necessity, mobile phones have gained growing significance. They serve as a remarkable means of communication across all age groups, with a particular focus on the younger generation. smartphone addiction is increased these days and it has huge effect on every individual trait so by reviewing these studied we find in India not much work done on the sample which researcher selected for this study. In this study researcher want to check effect of smart phone on some psychological trait. And to testing this in this research work researcher selected pupil teachers because use of technology and we freely get support that is only in education. These days in teacher education and basic teaching learning process technology contributed significantly. At recent in COVID-19 pandemic when everything is stopped, things again started with the use of technology. This time education work is all depend on online through phones. That is why I selected smartphone how it effects on pupil teacher's psychological factors.

Comment [CAVD6]: Reference

When researcher review researches regarding meta-cognitive there is many researches on meta-cognitive. In some researches it is opt like meta-cognitive awareness and in this study mobile phone use and meta-cognitive is positively co-related.[i] In one study we see mobile leaning and effect on student's meta-cognitive skill and in many other researches meta-cognitive is used as I.V and D.V also. But it did not link with pupil teacher's meta-cognitive skill.

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Therefore, researcher want to know is pupil teacher also have smartphone addiction. If yes then how smartphone addiction effect on their meta-cognitive skill which is about their skill related to teaching.

Smart phone addiction

Considering that today's teenagers heavily rely on mobile phones, it is of utmost importance to comprehend the adverse impacts of cell phones. As mobile phone features become more advanced, their negative effects on young people are escalating. Here are some of the negative effects of smartphones on teenagers listed below.

Comment [CAVD9]: Reference

Physical Problems: Using mobile phones can have numerous adverse effects on children's eyes, such as redness, itching and irritation, blurring of vision and even long-term damage. In addition to this, extended use can also lead to joint pain, neck ache and headaches. To prevent these undesirable health issues, it is essential to limit a child's exposure to the blue light emitted by mobile phones.

Comment [CAVD10]: Reference

Disorders of Eating and Sleeping: Mobile phone use during meals can lead children to lose their appetites, and prolonged smartphone usage may even contribute to the development of eating disorders. Additionally, many teenagers habitually use their mobile phones before bedtime to respond to messages and make calls, which can result in sleep deprivation. The lack of sufficient sleep can make them feel restless and have a negative impact on their overall well-being.[ii]

Comment [CAVD11]: Reference

Problems with mental health: There are many changes that can be observed in children's behaviour due to prolonged use of mobile phones. Teenagers frequently experience high levels of stress and anxiety, often concerning various aspects of their lives. Mood swings can be common, with emotional fluctuations occurring regularly. Additionally, you may observe signs of impatience even with straightforward tasks, as these emotions and pressures can impact their overall well-being and demeanor.

Comment [CAVD12]: Reference

Cut off from reality: Smartphones captivate teenagers with a myriad of engaging features, from social media to games, making it difficult for young users to limit their screen time. The allure of these functions can cause children to become so engrossed in their devices that they become oblivious to their surroundings, ultimately affecting their way of life. Over time, this can lead to a disregard for their parents, friends, and even broader society.

Comment [CAVD13]: Reference

Cyberbullying: Children open themselves up to the entire world when they engage with social media platforms like Facebook, Instagram and Snapchat. These platforms allow anyone, from any corner of the globe, to access your children's profiles, and this presents one of the most significant drawbacks of smartphones. Cyberbullies can easily hide behind screens, lurking and waiting for opportunities to target your children. It underscores the importance of parental vigilance and awareness in the digital age. Moreover, cyberattacks can trap your children in a variety of ways.

Comment [CAVD14]: Reference

Anxiety and mental illness: Mobile phones can be quite addictive, especially for students. Continuous use of them can lead to changes in behaviour, such as increased stress and anxiety, mood swings, and impatience with the smallest of things like slow WiFi or no immediate responses. It isn't only teenagers and students that are affected by this--adults can also experience these effects. So, it's understandable how easy it is for our kids to be drawn into this same pattern.

Comment [CAVD15]: Reference

Pressure from peers: Many teens and students take drugs because of peer pressure. In the same way, they might start demanding the latest and most expensive smartphones from you if they see

their friends owning them. Occasionally, teenagers commit suicide or criminal acts because their parents refused to give them a new smartphone if you don't meet their demands.

Comment [CAVD16]: Reference

Reduced Comprehension & Learning ability: Research has shown that kids learn better from real books than from digital versions. With the advent of smartphones, kids are increasingly reading from their smartphone screen, reducing their long-term

Comment [CAVD17]: Reference

Meta-cognitive skills

At first glance, the term "metacognition" might sound complex, like something you'd encounter in a psychology course or a self-help book on neuro-linguistic programming. However, in practical terms, it's simply a sophisticated way of teaching students how to become effective learners when they don't have a teacher readily available for assistance. Essentially, metacognition is about "thinking about thinking.

Metacognition can be divided into several types: -

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Metacognitive knowledge: Absolutely, an individual's metacognitive knowledge encompasses their understanding of their own cognitive processes. This includes being aware of what they know and don't know, recognizing their strengths and weaknesses in various cognitive skills, and identifying gaps in their knowledge. Furthermore, metacognitive knowledge extends to an understanding of the strategies and techniques they can employ to address these gaps and enhance their problem-solving abilities. In essence, it involves knowing how to effectively utilize their cognitive resources to navigate challenges and achieve their learning goals.

Comment [CAVD19]: Reference

Metacognitive regulation: Students employ various strategies to regulate their thoughts and emotions through metacognition. This involves their ability to plan, monitor, and evaluate their own performance. An example of metacognitive regulation occurs when an individual recognizes that a particular strategy is not yielding the desired results and decides to try a different approach.

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Objectives

To study the effect of smart phone addiction on pupil teacher's meta-cognitive.

Materials and Method

For the Present study is based on smart phone addiction on meta-cognitive skill, social maturity and existential concern among pupil teachers. This study is an empirical analysis of smart phone addiction on meta-cognitive skill. The current study used both a descriptive and a quantitative approach, because descriptive research aims to extract all available information about the current state of a phenomenon in order to describe "what exists" or "what is the actual picture of any concerned area in today's perspective. In this study, smart phone addiction (independent variable), and its impact was studied on the dependent variables, i.e. meta-cognitive skill.

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Results and discussion

The objective and hypothesis of the present study was to assess and compare the meta-cognitive skills and three different categories i.e. low, moderate and high of smartphone users. In this study, meta-cognitive skills scale developed by Dr. Madhu Gupta and Ms. Suman was used which had four parts (planning, implementation, monitoring and evaluation). Hence hypothesis has four parts, therefore, the means and S.Ds were calculated separately for each part and presented in the following tables.

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1. Planning Skill

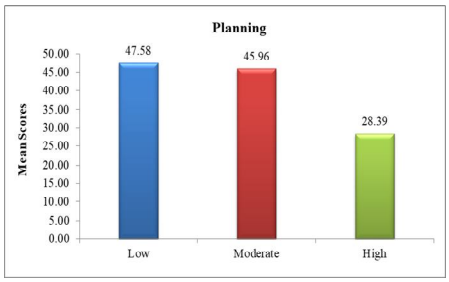

Fig. 1. Planning Skill

The above part of the section only explains the mean differences on planning but these differences do not reflect the significance of the mean differences. To accomplish this, one-way ANOVA was applied for further analysis. The following section includes one-way ANOVA on the first measure of meta-cognitive planning followed by Tukey post-hoc analysis.

Table 1: Summary of one way ANOVA for Planning

Comment [CAVD23]: One way

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32275.489	2	16137.745	389.604	.000
Within Groups	16444.101	397	41.421		
Total	48719.590	399			

The F-ratio is 389.60 which was found significant at 0.01 level indicating that the mean scores of smartphone users are significantly different in planning among the three groups. This shows that among the three groups of smartphone users, some groups are significantly different, but to verify which groups actually differ from each other, Tukey's HSD post hoc test was employed and Shown in the below table.

Table 2. Tukey's HSD post hoc test was employed

Groups	Mean Difference	Std. Error	Sig.
Low - Moderate	1.61649	1.08981	.300
Moderate - High	17.57629*	.68872	.000
High - Low	-19.19278*	1.06187	.000

*Significant at the 0.05 level

From above table it is clear that on planning the mean difference was not found to be significant between low and moderate smartphone users. Post-hoc analysis showed that the high group had significant differences compared to both the low and moderate groups. Though the difference was found to be significant yet it maintains that mean scores lie in the average category of planning skill scale. Thus the first part of first hypothesis has been verified.

2. Implementation Skill

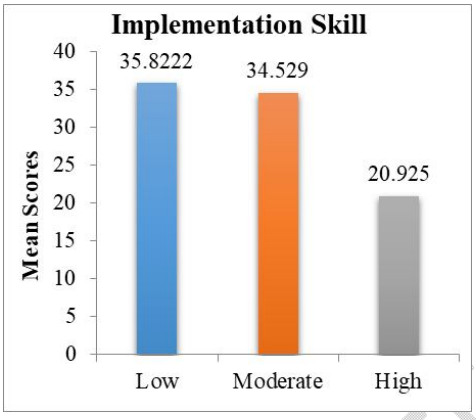

Fig. 2. Implementation Skill

The above section only explains the mean differences but these differences do not indicate the significance of the mean differences. To study the significant differences between the implementation skills among the three groups of smartphone users, ANOVA was applied. This presented a clear picture of the significance of the mean difference by providing F-values for implementation skills.

Table 3 : Summary of one way ANOVA for Implementation Skill

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19365.425	2	9682.713	419.148	.000
Within Groups	9171.072	397	23.101		
Total	28536.498	399			

The above table shows that there was a significant association in implementation skills among low, moderate and high smartphone users. The F-ratio (419.148) was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on implementation skills differed significantly between the three groups. This showed that the low, moderate and high groups are significantly different, but to verify which groups actually differ from each other, Tukey's HSD post hoc was employed and shown in the below table.

Table 4: Tukey Post-hoc test for significant group comparison on Implementation skills

Groups	Mean Difference	Std. Error	Sig.
Low - Moderate	1.29319	.81387	.252
Moderate - High	13.60403*	.51434	.000
High - Low	-14.89722*	.79301	.000
*Significant at the 0.05 level.			

The post-hoc Tukey test for implementation skills revealed significant differences between the high smartphone user group and both the low and moderate groups. However, no significant mean difference was found between the low and moderate smartphone user groups. It was also observed that although the difference between moderate and high or the difference between high and low was highly significant or the difference between low and moderate was not significant. Hence, the second part of the first hypothesis has been verified.

3. Monitoring Skill

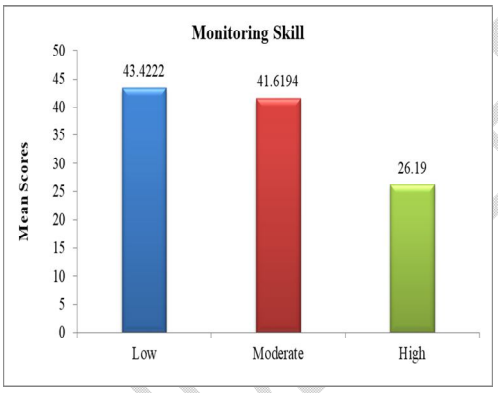

Fig. 3. Monitoring Skill

Table 5: Summary of one way ANOVA for Monitoring Skill

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25188.078	2	12594.039	338.781	.000
Within Groups	14758.300	397	37.175		
Total	39946.377	399			

The results shown in above table clearly indicate that there was a significant difference in monitoring skills among the three groups of smartphone users. The F-ratio (338.781) was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on monitoring skills differed significantly between the three groups. This showed that the low, moderate and high groups are significantly different, but to verify which groups actually differ from each other, Tukey's HSD post hoc was employed and shown in the below table.

Table 6: Tukey Post-hoc test for significant group comparison on Monitoring skills

Groups	Mean Difference	Std. Error	Sig.
Low - Moderate	1.80287	1.03244	.189
Moderate - High	15.42935*	.65246	.000
High - Low	-17.23222*	1.00597	.000
*Significant at the 0.05 level.			

The Tukey post-hoc test for monitoring skills demonstrated that the high smartphone user group differed significantly from both the low and moderate groups. However, no significant mean difference was observed between the low and moderate smartphone user groups. It was also observed that although the difference between moderate and high or the difference between high and low was highly significant or the difference between low and moderate was not significant. Hence, the third part of the first hypothesis has been verified.

4. Evaluation Skill

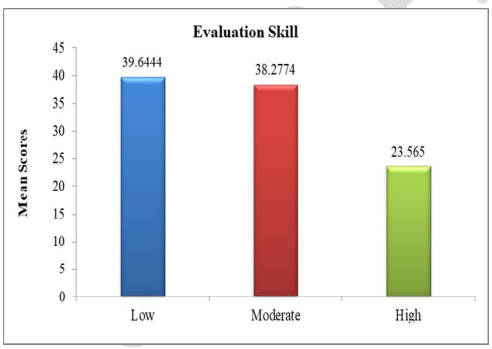

Fig. 4. Evaluation Skill

Table 7: Summary of one way ANOVA for Evaluation Skill

	Sum of Squares	df	Mean Square	F	Sig.
Between	22625.213	2	11312.606	370.292	.000

Groups					
Within Groups	12128.537	397	30.550		
Total	34753.750	399			

It is apparent from the above table that the statistical significant difference among the three groups of smartphone users who are in the category of low, moderate and high. The F-ratio (370.292) was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on evaluation skills differed significantly between the groups. This may thus indicate that all participants have different types of evaluation skills which can be defined as meta-cognitive skills as the ability to assess and reflect on both the processes employed and the finished product.

Table 8: Tukey Post-hoc test for significant group comparison on Evaluation skills

Groups	**Mean Difference**	**Std. Error**	**Sig.**
Low - Moderate	1.36703	.93595	.311
Moderate - High	14.71242*	.59148	.000
High - Low	-16.07944*	.91195	.000
*Significant at the 0.05 level.			

The Tukey test revealed that the high group was significantly different from the low and moderate group of smartphone users. The table also shows that no significant mean difference emerged between low and moderate smartphone users. It was also observed that although the difference between moderate and high or the difference between high and low was highly significant or the difference between low and moderate was not significant.

For proportional comparison of meta-cognitive skills (μ_1) between the three groups low, moderate and high smartphone users (μ_2), we have constructed null hypothesis such that there is not significant differences of smart phone addiction on pupil teachers' meta-cognitive skill i.e. H_0^1: $\mu_1 = \mu_2$. Against that, we have constructed alternative hypothesis such as there is a significant difference of smart phone addiction on pupil teachers' meta-cognitive skill i.e. H_a^1: $\mu_1 \neq \mu_2$.

Since calculated p-value is less than 0.05 at 5% confidence level of significance. So, we reject the null hypothesis (H_0^1: $\mu_1 = \mu_2$). Therefore, we conclude that low, moderate and high level of smartphones has a significant impact on the metacognitive skills of pupil teachers.

Conclusion

On the basis, of the above studies, The objective and hypothesis of the present study was to assess and compare the meta-cognitive skills and three different categories i.e. low, moderate and high of smartphone users.

Planning: The mean scores of three groups differed in which the high group got the lowest scores followed by the moderate group and low group which were at the highest score on planning. Although the scores of the three groups are different, yet on planning scores of all the three groups were found to be within the average range The F-ratio which was found significant

at 0.01 level indicating that the mean scores of smartphone users are significantly different in planning among the three groups. Post-hoc analysis showed that the high group differed significantly from both the low and moderate groups. Though the difference was found to be significant yet it maintains that
mean scores lie in the average category of planning skill scale

• **Implementation Skill**: The mean score on implementation skill was found to be highest for low smartphone users as compared to moderate and high smartphone users. The F-ratio was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on implementation skills differed significantly between the three groups. The Tukey post-hoc test revealed that the high group was significantly different from the low and moderate group of smartphone users. It was also observed that although the difference between moderate and high or the
difference between high and low was highly significant or the difference between low and moderate was not significant.

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• **Monitoring Skill:** The mean score on monitoring skill was found to be highest for
low smartphone users followed by moderate and low smartphone users. All the participants into three groups are getting average scores on monitoring skills. This indicates that monitoring skills refer to an average online awareness of understanding and task completion along with the ability to engage in periodic self-testing while learning. The F-ratio was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on monitoring skills differed significantly between the three groups. Tukey post-hoc test revealed that the high group was significantly different from the low and moderate group of smartphone users. It was also observed that although the difference between moderate and high or the
difference between high and low was highly significant or the difference between low and moderate was not significant.

• **Evaluation Skill:** The mean score on evaluation skill was found to be highest for
low smartphone users followed by moderate and low smartphone users. The F-ratio was found to be highly significant (p=0.000) at the 0.01 level, indicating the fact that the average scores of smartphone users on evaluation skills differed significantly between the groups. This may thus indicate that all participants have different types of evaluation skills which can be defined as meta-cognitive skills as the ability to assess and reflect on both the processes employed and the finished product. The Tukey post-hoc test revealed that the high group was significantly different from the low and moderate group of smartphone users. It was also observed that although the difference between moderate and high or the difference between high and low was highly significant or the difference between low and moderate was not significant. Therefore, we conclude that low, moderate and high level of smartphones has a significant impact on the metacognitive skills of pupil teachers.