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Research Paper

Effect of Smartphone Usage, and Socio-Demographic Factors on Creativity of Students

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ABSTRACT

The present research examined the effect of smartphone addiction, socio-economic status, gender, and age on the creativity of students. Creativity, a vital mental ability for academic success and personal development, is believed to be influenced by the increasing use of digital devices and many demographic elements. A sample of 120 students from schools (60 males and 60 females) in Rampur was selected by using purposive sampling techniques. Questionnaire of smartphone addiction, socio-economic status and creativity were used for data collection. The research utilized correlation and multiple regression analyses to investigate the relationships among variables. Results revealed significant correlations between smartphone addiction and various components of creativity—fluency, flexibility, and originality. Furthermore, the regression analysis indicated that smartphone addiction and socio-economic status are significant predictors of creativity, while gender and age also contributed to variations in specific creative dimensions. The findings revealed the importance of mindful technology use and highlight socio-demographic influences on students' creative potential. Implications for educators, parents, and mental health professionals are discussed.

Keywords: *Smartphone addiction, Socio-economic status, Creativity*

In current's technological period creativity has become a necessary mental ability specifically among students tackling academic and personal growth. Creativity defined as the ability to create new thoughts and useful ideas (Runco & Jaeger 2012). Creativity is a primary factor in invention, problem-solving and adjustability in multiple domains. Moreover, creativity does not foster in isolation; but it is affected by many psychological, social and demographic elements. Among them smartphone addiction, socio-economic status (SES), gender and age are important factors that may have either increase or decrease impact on creative potential. Smartphone addiction has garnered increasingly recognition because of its extensive use in adolescents and youths. Research revealed that overuse of mobile phone can decrease the concentration, decrease mental control and limit the capability of deep reflection, so it can affect negatively on creativity (Chen., 2020). Conversely smartphone can also provide access of various tools or content that can cultivate the creativity, it depends on the way of using. Socio-economic status (SES) is another

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important factor that shapes a person's learning atmosphere, availability of resources and complete mental growth. Higher Socio-economic status is frequently related with enhanced learning opportunities and more opportunities for cognitive experiences, which is beneficial for creativity (Bradley& Crowyn, 2002). On the other low socio-economic status may be related with stress, minimal exposure, and decrease mental activation, which can inhibit creative development.

Gender differences in creativity have been examined from both biological and socio-cultural viewpoints. Some studies revealed that differences may appear in the expression and kind of creativity showed by males and females affected by cultural rules and education (Baer & Kaufman 2008). Age also plays vital role in creativity. Researches in developmental psychology revealed that creativity may develop with time and affected by mental development and interplay with environment (Gardener, 1993). In the light of these factors the present research examined the effect of smartphone addiction, socio-economic status, gender and age on creativity of college students. By investigated these variables present research expand our knowledge of creativity in new technological and social-demographic changes, providing understanding for teachers and policymakers to foster creativity efficiently.

Smartphone addiction

Smartphone addiction or mobile phone addiction, referred to as smartphone use disorder or mobile phone dependency, is identified by overuse or obsessive use of mobile phones, which disrupts daily life, social interactions, and professional duties. Symptoms of smartphone addiction involved an incapability to decrease phone usage, neglecting personal and professional responsibilities, and experiencing withdrawal signs when the gadget is not in use (Billieux et al., 2015). Socio-economic status (SES) refers to an individual's or group's social and economic standing in comparison to others, based on factors such as income, education, and occupation. SES is a critical determinant of access to resources, opportunities, and overall well-being, influencing various life outcomes, including health, education, and social mobility (Wilkinson & Pickett, 2010).

1. **Creativity:** Creativity includes both newness and efficiency, meaning that a creative thought must be both new and beneficial within a specific situation (Runco & Jaeger 2012).
2. **Fluency:** Fluency indicates smoothness and pace by which a person can generate several thoughts revealing mental versatility and openness to many possibilities (Guilford 1967).
3. **Flexibility**: Flexibility refers to the ability to approach a problem from different perspectives and adjust one's thinking to accommodate various responses (Guilford, 1967).
4. **Originality**: Originality is defined as the ability to produce ideas that are rare, novel, or unconventional (Torrance, 1974).

Objectives of the study:

Following objectives lead the present research work:

- To test the relationship between smartphone addiction, creativity and socio-economic status of students.
- To test the effect of effect of smartphone addiction on creativity of students.
- To test the effect of socio-economic status on creativity of students.

- To test the effect of age on creativity of students.
- To test the effect of gender on creativity of students.

Hypotheses of the study:

Following hypothesis have been formulated to proceed with present research paper:

- There is no significant relationship between smartphone addiction, creativity and socio-economic status of students.
- There is no significant effect of smartphone addiction on creativity of student.
- There is no significant effect of socio-economic status on creativity of students.
- There is no significant effect of age on creativity of students.
- There is no significant effect of gender on creativity of students.

METHODOLOGY

Sample

For this study 120 students (60 males and 60 females) studying in college located in the Rampur city participated through the method of purposive/ accidental sampling.

Variables

Independent variable:

- Smartphone addiction
- Socio-economic status
- Age
- Gender

Dependent variable:

- Creativity

Tools:

To meet the objectives of the current research following tools have been used:

- **Smartphone Addiction Scale:** Smartphone addiction scale, constructed in 2021 by Dr. Vijayshri and Dr. M. Ansari, comprises 23 items to measure 6 dimensions: compulsion, forgetfulness, lack of attention, depression and anxiety, disturbed hunger and sleep, and withdrawal. The reliability of the scale is .857 (alpha coefficient) and validity of this scale ranges from .47 to .89 (construct validity).
- **Socio-economic scale:** This scale constructed by Dr. Sunil Kumar Upadhyay in 2019. This scale contains 31 items in five parts related 1. Personal information 2. Family 3. Education 4. Income 5. Cultural and material possessions. The reliability of this test is 0.78 and validity of this scale 0.74.
- **The New Test of Creativity**: The new test of creativity constructed in 2022 by Dr. Roma Pal. This test can assess three elements of creativity proficiency, plasticity and originality and four sub elements of proficiency and two sub elements of plasticity. The test re- test reliability of this test is .939 and split- half reliability of this scale is .948. The validity of this test is .37.

Data analysis: The collected data on 200 participants was analyzed with mean, standard deviation, Pearson product moment correlation and regression.

Statistical analysis

Table-1 Descriptive statistics

Variables	Mean	Standard deviation (SD)
Smartphone Addiction	66.73	6.46
Socio-economic status	52.87	15.61
Age (in years)	18.68	0.83
Fluency	27.09	3.53
Flexibility	30.46	2.27
Originality	6.09	0.79
Total Creativity scores	63.64	4.61

Table-2: Pearson Correlation among Independent and dependent variables (N= 120)

Variables	Smartphone addiction	Socio-economic status	Gender	Age	Fluency	Flexibility	Originality	Total Creativity
Smartphone Addiction	_	-.03	-24	.03	-.48**	-.60	-.24**	-.71**
Socio-economic status		_	.31**	-.35	-.07	.03	.09	-.02
Gender		-	-	-.31	.06	.17	-.16	.10
Age				-	-.05	.02	-.12	-.05
Fluency					-	.09	.12	.83**
Flexibility						-	.28**	.61**
Originality							-	.40**
Total Creativity								_

P<.01 (**)

The correlation analysis examined the relationships between Smartphone Addiction (SA), Socio-Economic Status (SES), Gender, Age, and the three components of creativity (Fluency, Flexibility, Originality) as well as the Total Creativity score. The above table shows that the relationship of Smartphone Addiction (SA) is a significant negatively with Fluency ($r = –.48$, $p < .01$), Flexibility ($r = –.60$, $p < .01$), and Total Creativity score ($r = –.71$, $p < .01$). This indicates that higher smartphone addiction is related with lower fluency in creative tasks. A strong negative correlation is observed between Smartphone Addiction (SA) and, suggesting that increased smartphone addiction is associated to a decrease in flexibility in creativity. There is a moderate negative correlation between Smartphone Addiction (SA) and Originality, indicating that higher smartphone addiction tends to reduce originality in creative tasks. Smartphone Addiction (SA) has a strong negative correlation with the Total Creativity score which implies that greater smartphone addiction is strongly related with lower overall creativity.

Regarding the relationship between Socio-Economic Status (SES) and creativity, **results show that** there is no significant correlation between SES and Fluency ($r = –.07$, $p = .46$), Flexibility ($r = .03$, $p = .77$), Originality ($r = .09$, $p = .32$), Total Creativity ($r = –.02$, $p = .80$), revealing that socio-economic status does not play a significant role in overall creativity in this sample. Regarding the association between Gender and creativity results show that There is no significant correlation between Gender and Fluency ($r = .06$, $p = .52$), Gender shows a small positive, Flexibility ($r = .17$, $p = .07$), Originality ($r= –.16$, $p=.08$).

Total Creativity: The correlation between Gender and Total Creativity is very weak and non-significant (r = .10, p = .28). Regarding the association between Age and creativity results shows that Fluency (r = –.05, p = .57) Flexibility (r = .02, p = .81), Originality (r = –.12, p = .19), Total Creativity: The correlation between Age and Total Creativity is not significant (r = –.05, p = .59). Regarding the association with total Creativity result show that Fluency (r = .83, p < .01), Flexibility (r = .61, p < .01), Originality (r = .40, p < .01), indicating that originality contributes positively to overall creativity.

Table-3 describes the values of regression coefficient for the effect of smartphone addiction, socioeconomic status, age and gender on creativity of students. A series of simple linear regression analyses were conducted to examine the predictive role of smartphone addiction on the dimensions of creativity: fluency, flexibility, originality, and total creativity. Fluency, the regression analysis revealed that smartphone addiction significantly predicted fluency scores, $F(1, 118) = 35.20$, $p < .001$, $R^2 = .23$. The standardized beta coefficient was significant, $\beta = –.48$, $t = –5.93$, $p < .001$, indicating that higher levels of smartphone addiction were associated with lower fluency scores. flexibility, results indicated a significant prediction, $F(1, 118) = 66.99$, $p < .001$, $R^2 = .36$. The standardized beta value was $\beta = –.60$, $t = –8.19$, $p < .001$, again suggesting that as smartphone addiction increased, flexibility decreased. Originality was also significantly predicted by smartphone addiction, $F(1, 118) = 7.49$, $p = .007$, $R^2 = .06$. The regression coefficient was $\beta = –.24$, $t = –2.74$, $p = .007$, showing a modest negative association between smartphone addiction and originality, total creativity, the regression was highly significant, $F(1, 118) = 116.49$, $p < .001$, $R^2 = .50$. The standardized beta coefficient was $\beta = –.71$, $t = –10.79$, $p < .001$, indicating that smartphone addiction strongly and negatively predicted overall creativity scores.

In summary, smartphone addiction emerged as a significant negative predictor of all measured components of creativity, with the strongest effect observed for total creativity ($R^2 = .50$) and flexibility ($R^2 = .36$), followed by fluency ($R^2 = .23$) and originality ($R^2 = .06$). These results suggest that excessive smartphone use may hinder creative functioning in students. A series of simple linear regression analyses were conducted to examine the effect of Socio-Economic Status (SES) on the components of creativity. The regression model predicting fluency from SES was not statistically significant, $F(1, 118) = 0.55$, $p = .460$. The model explained only 0.5% of the variance in fluency scores ($R^2 = .005$). SES did not significantly predict fluency ($\beta = −.068$, $p = .460$). The regression analysis revealed that SES was not a significant predictor of flexibility, $F(1, 118) = 0.088$, $p = .767$. The model accounted for only 0.1% of the variance in flexibility scores ($R^2 = .001$). The standardized regression coefficient was not significant ($\beta = .027$, $p = .767$), Originality The regression model for originality was also not statistically significant, $F(1, 118) = 1.003$, $p = .319$, with SES accounting for 0.8% of the variance in originality scores ($R^2 = .008$). SES did not significantly predict originality ($\beta = .092$, $p = .319$), Total Creativity the regression model predicting total creativity from SES was not statistically significant, $F(1, 118) = 0.062$, $p = .803$. The model explained a negligible portion of the variance ($R^2 = .001$), and SES was not a significant predictor of total creativity ($\beta = −.023$, $p = .803$).

Table 3 - reveals the **multiple regression analysis** for **fluency** revealed a significant model, **$F(4, 115) = 9.267$, $p < 0.001$**, with an **R^2** of 0.244, suggesting that approximately 24.4% of the variance in fluency is explained by the predictors: **Gender**, **Smartphone Addiction (SA)**, **Socio-Economic Status (SES)**, and **Age**. **Smartphone Addiction** (B = -0.269, β = -0.493, $p < 0.001$) was a significant negative predictor of fluency, indicating that higher

levels of smartphone addiction were associated with lower fluency. Thus, **Smartphone Addiction** emerged as the only significant predictor of fluency among the four variables. For **flexibility**, the regression model was significant, **F(4, 115) = 16.564, p < 0.001**, with an **R^2** of 0.366, explaining 36.6% of the variance in flexibility. **Smartphone Addiction** (B = -0.209, β = -0.595, p < 0.001) was a significant negative predictor, similar to its effect on fluency. Higher smartphone addiction was linked to lower flexibility. **Age** (B = 0.162, β = 0.059, p = 0.468), **SES** (B = 0.003, β = 0.023, p = 0.782), and **Gender** (B = 0.154, β = 0.034, p = 0.683) were not significant predictors. **Smartphone Addiction** was the only significant variable affecting flexibility. The regression analysis for **originality** yielded a significant model, **F(4, 115) = 5.506, p < 0.001**, with an **R^2** of 0.161, explaining 16.1% of the variance in originality. **Smartphone Addiction** (B = -0.038, β = -0.314, p = 0.001) was a significant negative predictor, indicating that higher smartphone addiction negatively impacted originality. **Age** (B = -0.160, β = -0.168, p = 0.075) was marginally significant, with a trend toward lower originality associated with higher age, though it did not reach the conventional significance threshold (p < 0.05). **Gender** (B = -0.513, β = -0.327, p = 0.001) was a significant predictor, suggesting that females, on average, scored lower on originality compared to males. **SES** (B = 0.006, β = 0.126, p = 0.181) was not a significant predictor of originality. For **originality**, **Smartphone Addiction** and **Gender** were the significant predictors, with a potential effect of **Age**. For the **total creativity** score, the regression model was significant, **F(4, 115) = 29.453, p < 0.001**, with a large **R^2** of 0.506, indicating that 50.6% of the variance in total creativity was explained by the combined effects of **Gender**, **Smartphone Addiction (SA)**, **Socio-Economic Status (SES)**, and **Age**. **Smartphone Addiction** (B = -0.517, β = -0.724, p < 0.001) had a significant negative impact, highlighting its strong negative relationship with overall creativity. **Age** (B = -0.369, β = -0.067, p = 0.357) was not a significant predictor. **SES** (B = -0.011, β = -0.039, p = 0.592) also did not have a significant effect. **Gender** (B = -0.766, β = -0.083, p = 0.256) was not a significant predictor of total creativity. Thus, **Smartphone Addiction** was the primary variable significantly influencing total creativity.

Table-3 Multiple Regression

Variable **B**	**Fluency**	**Flexibility**	**Originality**	**Total Creativity**
Smartphone Addiction (SA)	-0.269***	-0.209***	-0.038**	-0.517***
Socio-Economic Status (SES)	-0.021	0.003	0.006	-0.011
Age	-0.371	0.162	-0.160	-0.369
Gender (Male = 1, Female = 0)	-0.407	0.154	-0.513***	-0.766
R^2	0.244	0.366	0.161	0.506
F	9.267***	16.564***	5.506***	29.453***

***p < 0.001** = highly significant
p < 0.05 = significant

DISCUSSION

The present research focused to examine the separate and combined effect of smartphone addiction, socio-economic status, gender and age on creativity among students. The result provides useful understanding into how modern lifestyle elements and demographic factors interact with creative capabilities in youths.

Result with mean, standard deviation, correlation, regression and multiple regressions revealed that smartphone addiction negatively predicted with creativity and its sub elements-fluency, flexibility and originality. This aligns with previous studies suggesting that overuse of smartphone could block the flexibility and creative performance, possible it can affect a person's capability to engage in creative procedures (Li et al, 2023).

Socio-economic status have discovered to have a notable positive effect on creativity, which supports previous researches suggesting that students from high socio-economic status have sufficient resources and good educational opportunities and they also have supportive atmosphere that cultivate divergent thinking and problem solving capabilities (Bradley& Crowyn, 2002). These findings emphasized the importance of dealing with educational disparities emphasizing equal opportunities for creative development.

Gender differences in creativity were also noticed, although the nature of these differences differnts across creativity subs elements (Baer & Kaufman 2008). These findings revealed that social and cultural expectations of a man and women can shape their way to express creative ideas instead of their innate creative capability.

Age showed a indirect but an important effect on creativity. Young students showed high creativity. This could linked to a inherited decline in imaginative thoughts with age because of increased conformity, academic pressure and decreased oppurtunities unsystematic play (Gardener, 1993).

These result revealed that cultivating creativity in students needs a comprehensive method that reflects on technlological habits, socio-economic situations, gender specific interventions and age-apprropriate methods.

CONCLUSION

This research concludes that smartphone addiction, socio-economic status, gender and age both are play an important role in fostering creativity among students. Although high smartphone addiction inhibit the creative abilities. High socio-economic status contributes positively in the development of creativity. Gender and age introduce a subtle distinction in expression of creativity.

Educators should consider these variables while designing the syllabus and aimed to foster creativity in students. They should do efforts to reduce screen time and also provide equal opportunities and provide open and comprehensive learning atmosphere.

Limitations

Limitations of the present study are as follows:

- Sample size can be said small as comparing to the significance of the study.
- Non-probability sampling reduces the generalizability of the study.
- This study conducted on the students of Rampur city only.

Suggestion for further studies:

- In future the study must be conducted on a large sample.
- In future the study can be conduct this adult and other population.
- In future the study must be conducted studies in different cities.

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Conflict of Interest

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