

Big Five Personality Traits as Predictors of Academic Performance in ICT-Integrated Flipped Classrooms Using Social Network Sites

Dr Wajid Mahnaz

wajid.mahnaz@yahoo.com

PhD Education, Department of Education, Alhamd Islamic University Islamabad, Pakistan

Nayab

nayabgull96@gmail.com

Master of Education, Department of Education, University of Peshawar, Pakistan

Corresponding Author: Dr Wajid Mahnaz wajid.mahnaz@yahoo.com

Received: 29-01-2026

Revised: 13-02-2026

Accepted: 28-02-2026

Published: 14-03-2026

ABSTRACT

This study investigated the predictive role of Big Five Personality Traits on academic performance in ICT-integrated flipped classrooms using Social Networking Sites (SNSs). The objectives were to examine the relationship between personality traits and academic performance, explore the impact of SNS usage on learning outcomes, and determine the influence of personality traits on SNS engagement. A quantitative correlational research design was employed with a sample of 340 secondary-level students aged 13–17 years, selected through convenience sampling. Data were collected using self-developed questionnaires measuring Big Five Personality Traits (BFPTs) and Usage of SNSs (USNSs). The instruments were validated by experts and demonstrated acceptable reliability (Cronbach's Alpha > 0.80). Data analysis using correlation revealed a moderate positive relationship between personality traits and academic performance ($r = .612, p < .01$), a significant positive correlation between SNS usage and academic performance ($r = .547, p < .01$), and a moderate positive association between personality traits and SNS engagement ($r = .489, p < .01$). The findings indicate that students' personality traits significantly influence both their learning outcomes and their engagement with SNS-based learning tools, while effective SNS usage enhances academic performance in flipped classroom settings. The study concludes that integrating personality-informed strategies and SNS tools in ICT-supported flipped classrooms can improve student engagement and achievement. Recommendations include the adoption of personalized instructional approaches, structured SNS-based learning activities, and teacher training on leveraging ICT tools to accommodate individual differences in personality and learning styles.

Keywords: Big Five Personality Traits, Academic Performance, ICT, Flipped Classrooms, Social Network Sites

INTRODUCTION:

The rapid advancement of digital technologies has significantly transformed modern education systems across the world. The integration of Information and Communication Technology (ICT) into educational settings has reshaped teaching methodologies, learning environments, and the ways in which students interact with knowledge. Educational institutions are increasingly incorporating digital tools, online platforms, and interactive technologies to enhance students' learning experiences and academic outcomes. The use of ICT has enabled the development of innovative pedagogical approaches that promote active learning, collaboration, and student engagement. Researchers emphasize that technology-supported learning environments provide opportunities for flexible learning, access to diverse educational resources, and improved communication between teachers and learners (Bond et al., 2020; Voogt et al., 2015).

Consequently, ICT has become a crucial component in modern education, facilitating new instructional models such as blended learning and flipped classroom approaches.

Information and Communication Technology (ICT) refers to a wide range of digital technologies used to collect, process, store, and disseminate information. In the context of education, ICT includes tools such as computers, mobile devices, digital learning platforms, internet resources, and online communication systems that support teaching and learning processes. The integration of ICT in education has been associated with improved access to knowledge, enhanced learning efficiency, and the development of critical thinking and problem-solving skills among students. Studies have shown that ICT enables students to access educational materials anytime and anywhere, thereby promoting independent and self-directed learning (Redecker, 2017; Schindler et al., 2017). Furthermore, ICT-based learning environments facilitate collaborative learning, enabling students to interact with peers and instructors through various digital platforms. As a result, ICT has become an essential tool for implementing modern instructional strategies that support student-centered learning.

One of the most innovative instructional strategies supported by ICT is the flipped classroom approach. The flipped classroom represents a pedagogical model that reverses the traditional structure of classroom instruction. In a conventional teaching model, instructors deliver lectures during class time and assign homework for students to complete independently outside the classroom. In contrast, the flipped classroom requires students to engage with instructional content, such as recorded lectures, videos, or reading materials, before attending class, while classroom time is devoted to interactive activities such as discussions, problem-solving tasks, and collaborative projects. This instructional strategy allows teachers to focus on facilitating learning rather than merely delivering content. Research indicates that flipped classrooms promote active learning, enhance students' critical thinking skills, and improve academic performance by encouraging deeper engagement with course materials (Lo & Hew, 2017; O'Flaherty & Phillips, 2015). Moreover, ICT plays a fundamental role in supporting flipped classroom environments by providing digital resources and platforms that enable students to access learning materials prior to class sessions.

In addition to ICT tools, Social Networking Sites (SNSs) have emerged as powerful platforms for communication, collaboration, and information sharing in educational contexts. Social Networking Sites are online platforms that allow individuals to create personal profiles, interact with others, and exchange content within digital communities. Examples of widely used SNSs include Facebook, WhatsApp, YouTube, Instagram, and Twitter, which are frequently utilized by students for both social and academic purposes. In educational settings, SNSs provide opportunities for collaborative learning, peer interaction, and knowledge sharing beyond the traditional classroom environment. Researchers have highlighted that SNSs facilitate communication between students and teachers, support group discussions, and enable the sharing of educational resources in real time (Greenhow & Chapman, 2020; Tess, 2016). When integrated with flipped classroom strategies, SNSs can serve as effective platforms for distributing instructional materials, conducting online discussions, and promoting collaborative learning among students.

The integration of SNSs within ICT-supported flipped classrooms has gained considerable attention in recent years because of its potential to enhance student engagement and academic achievement. In flipped learning environments, teachers often utilize SNS platforms to share pre-class instructional materials, such as videos, articles, and lecture slides, allowing students to review the content before attending class. Students can also use SNSs to ask questions, participate in discussions, and collaborate with peers on learning activities. Studies suggest that the use of SNSs in education encourages active participation, improves communication among learners, and strengthens students' sense of academic community (Manca, 2020; Tang & Hew, 2017). Moreover, SNS-based learning environments provide students with opportunities to engage in informal learning, which complements formal classroom instruction and enhances overall learning outcomes.

Academic performance is a key indicator of students' success in educational settings and is typically measured through grades, examination scores, and other academic achievements. It reflects the extent to which students have acquired knowledge, skills, and competencies through the learning process. Academic performance is influenced by a variety of factors, including teaching methods, learning environments, motivation, cognitive abilities, and psychological characteristics. In technology-supported learning environments, students are required to actively engage with digital resources and manage their own learning processes, which can significantly affect their academic outcomes. Research has shown that students' academic performance in ICT-based learning environments is influenced not only by technological factors but also by individual characteristics such as motivation, self-regulation, and personality traits (Broadbent & Poon, 2015; Richardson et al., 2017). Therefore, understanding the role of personal attributes is essential for improving students' academic success in modern digital learning contexts.

Among various psychological factors, personality traits have been widely recognized as important predictors of academic behavior and achievement. One of the most widely accepted frameworks for understanding personality differences is the Big Five Personality Traits model. This model categorizes personality into five major dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Openness refers to an individual's curiosity, creativity, and willingness to explore new ideas and experiences. Conscientiousness describes the degree of organization, responsibility, and persistence demonstrated by an individual. Extraversion reflects sociability, enthusiasm, and the tendency to engage in social interactions. Agreeableness represents kindness, cooperation, and empathy toward others, while neuroticism refers to emotional instability and the tendency to experience negative emotions such as anxiety and stress (John & Soto, 2016; Soto & John, 2017). These personality dimensions influence individuals' behaviors, attitudes, and interactions in various contexts, including educational environments.

Previous studies have demonstrated that the Big Five Personality Traits significantly influence students' learning behaviors and academic performance. Among these traits, conscientiousness has consistently been identified as one of the strongest predictors of academic achievement because conscientious students tend to be disciplined, organized, and motivated to accomplish academic tasks. Similarly, openness to experience is associated with intellectual curiosity and a willingness to engage with new ideas and technologies, which may enhance students' participation in ICT-supported learning environments. Extraversion can influence students' engagement in collaborative activities and discussions, which are common features of flipped classrooms and SNS-based learning platforms. Agreeableness may promote cooperative learning and positive interactions with peers, while high levels of neuroticism may negatively affect academic performance due to increased anxiety and stress (Credé et al., 2017; Komarraju et al., 2016).

In ICT-integrated flipped classroom environments, personality traits may play an even more significant role because students are required to take greater responsibility for their learning. The flipped classroom approach emphasizes self-directed learning, time management, and active participation in classroom activities. Students must independently review digital learning materials before class and engage in collaborative problem-solving during classroom sessions. These learning behaviors are closely related to personality characteristics such as conscientiousness, openness, and extraversion. For example, conscientious students may be more likely to complete pre-class assignments and actively participate in classroom discussions, while students high in openness may show greater interest in exploring digital resources and engaging with innovative learning technologies (Kim et al., 2018; Shi et al., 2019). Therefore, personality traits can significantly influence how students interact with ICT-based learning environments and ultimately affect their academic outcomes.

Furthermore, the use of SNSs within flipped classrooms may also interact with students' personality traits in shaping their learning experiences. SNS platforms encourage communication, collaboration, and information sharing, but students' engagement with these platforms may vary depending on their personality

characteristics. Extraverted students may actively participate in online discussions and collaborative activities, while introverted students may prefer observing or engaging in asynchronous communication. Similarly, students high in openness may be more willing to explore new digital tools and learning platforms, whereas students with high levels of neuroticism may experience anxiety related to online interactions or academic expectations (Huang, 2019; Manca, 2020). Understanding these personality differences is essential for designing effective ICT-supported flipped classroom strategies that accommodate diverse learner needs.

Despite the growing adoption of ICT, flipped classroom pedagogy, and SNS-based learning platforms in education, limited research has examined how personality traits influence students' academic performance in such environments. Many studies have investigated the effectiveness of flipped classrooms or the educational use of SNSs; however, relatively few studies have explored the predictive role of the Big Five Personality Traits in ICT-integrated flipped classroom contexts. Examining these relationships can provide valuable insights into how individual differences shape students' engagement with technology-enhanced learning environments. Therefore, this study aims to investigate the role of Big Five Personality Traits as predictors of academic performance in ICT-integrated flipped classrooms using SNSs. By understanding how personality characteristics influence students' interaction with digital learning platforms and instructional strategies, educators can develop more effective and personalized teaching approaches that enhance students' learning experiences and academic success.

Objectives of the Study

1. To examine the relationship between Big Five Personality Traits and students' academic performance in ICT-integrated flipped classrooms using SNSs.
2. To investigate the role of SNSs as ICT tools in supporting flipped classroom learning and their effect on students' academic performance.
3. To determine the predictive influence of Big Five Personality Traits on academic performance of students in ICT-integrated flipped classroom environments.

Hypothesis of the Study

H1: There is a significant relationship between Big Five Personality Traits and students' academic performance in ICT-integrated flipped classrooms using SNSs.

H2: The use of SNSs as ICT tools in flipped classrooms significantly influences students' academic performance.

H3: Big Five Personality Traits significantly predict students' academic performance in ICT-integrated flipped classroom settings using SNSs.

Significance of the Study

This study is significant because it contributes to the growing body of knowledge regarding the integration of ICT and innovative teaching approaches in modern education. With the increasing use of digital technologies in classrooms, understanding how different factors influence students' academic outcomes has become essential. This research will provide valuable insights into how ICT-supported flipped classroom strategies and Social Networking Sites (SNSs) can enhance students' learning experiences and academic performance.

The study is also important in highlighting the role of personality traits in technology-based learning environments. By examining the predictive role of the Big Five Personality Traits, the research will help educators understand how individual differences influence students' engagement with ICT tools, SNS-based learning platforms, and flipped classroom activities. Such understanding can assist teachers in designing instructional strategies that accommodate diverse learner characteristics and promote effective learning outcomes.

Furthermore, the results of this study may benefit teachers, educational institutions, and curriculum developers by providing evidence-based insights for improving teaching practices in technology-enhanced classrooms. The results can guide educators in effectively utilizing SNSs and ICT tools to support flipped learning and foster greater student participation, collaboration, and academic achievement.

LITERATURE REVIEW:

Introduction to ICT in Education

The rapid development of digital technologies has significantly transformed modern educational systems. Educational institutions are increasingly integrating Information and Communication Technology (ICT) into teaching and learning processes to enhance student engagement, improve access to information, and support innovative instructional methods. ICT-based learning environments allow students to access educational resources, communicate with teachers and peers, and participate in interactive learning activities beyond traditional classroom boundaries. Researchers have emphasized that the use of ICT in education promotes collaborative learning, critical thinking, and active student participation in the learning process (Bond et al., 2020; Voogt et al., 2015). As a result, ICT has become an essential component of contemporary educational practices aimed at improving teaching effectiveness and academic outcomes.

Information and Communication Technology refers to a wide range of digital tools and technologies used to collect, process, store, and share information. In educational contexts, ICT includes computers, mobile devices, internet-based platforms, learning management systems, and multimedia applications that support teaching and learning activities. The integration of ICT enables students to access learning materials anytime and anywhere, which promotes flexible and self-directed learning. Studies indicate that ICT-supported learning environments enhance students' cognitive skills, improve problem-solving abilities, and foster collaborative learning experiences (Redecker, 2017; Schindler et al., 2017). Furthermore, ICT facilitates communication and interaction between teachers and students through digital platforms, which can enhance the overall learning experience and academic performance.

Flipped Classroom as an ICT-Supported Pedagogical Approach

One of the most significant instructional innovations supported by ICT is the flipped classroom model. The flipped classroom is an instructional strategy that reverses the traditional teaching method by delivering lecture materials outside the classroom and using class time for interactive learning activities. In this approach, students are required to review instructional materials such as recorded lectures, videos, or reading resources before attending class, while classroom sessions are devoted to discussions, problem-solving activities, and collaborative learning tasks. This model promotes active learning and encourages students to engage more deeply with course content (Lo & Hew, 2017; O'Flaherty & Phillips, 2015).

Research suggests that flipped classroom environments improve students' academic performance by promoting student-centered learning and active engagement with course materials. Kim et al. (2018) found that students participating in flipped classrooms demonstrated higher levels of participation and engagement compared to those in traditional lecture-based classrooms. Similarly, Shi et al. (2019) reported that flipped

learning strategies enhanced students' understanding of course concepts and improved their cognitive learning outcomes. The use of ICT tools such as video lectures, digital resources, and online discussion forums allows students to learn at their own pace and review complex concepts multiple times, which can significantly improve knowledge retention and comprehension.

In addition, flipped classrooms allow teachers to provide individualized guidance and feedback during classroom sessions. Instead of spending class time delivering lectures, instructors can focus on facilitating discussions, clarifying difficult concepts, and guiding students through problem-solving activities. This interactive learning environment encourages collaboration among students and promotes deeper understanding of the subject matter. Consequently, the flipped classroom model has gained considerable attention as an effective instructional strategy in technology-enhanced education.

Role of Social Networking Sites (SNSs) in Education

Social Networking Sites (SNSs) have emerged as powerful tools for communication, collaboration, and knowledge sharing in educational contexts. SNSs are online platforms that allow users to create personal profiles, interact with others, and share information within digital communities. Popular SNS platforms such as Facebook, WhatsApp, Twitter, Instagram, and YouTube are widely used by students for both social and academic purposes. In educational settings, SNSs can facilitate communication between teachers and students, support collaborative learning, and enable the sharing of educational resources in real time (Greenhow & Chapman, 2020; Manca, 2020).

The use of SNSs in education has expanded rapidly due to their accessibility and familiarity among students. These platforms provide opportunities for informal learning and allow students to engage in academic discussions outside the classroom. According to Tess (2016), SNSs can enhance student participation and engagement by creating a more interactive and collaborative learning environment. Similarly, Tang and Hew (2017) found that social media platforms encourage students to share ideas, ask questions, and participate in academic discussions, which can improve their understanding of course content.

When integrated with flipped classroom strategies, SNSs can serve as effective platforms for delivering instructional materials and facilitating pre-class learning activities. Teachers can use SNS platforms to share lecture videos, reading materials, and discussion prompts before class sessions. Students can review these materials and engage in online discussions with their peers, which prepares them for more meaningful participation in classroom activities. Studies have shown that the use of SNSs in flipped classrooms enhances communication and collaboration among students, thereby improving their overall learning experience (Huang, 2019; Manca, 2020).

Academic Performance in Technology-Enhanced Learning Environments

Academic performance is one of the most important indicators used to evaluate students' success in educational settings. It reflects the extent to which students have acquired knowledge, skills, and competencies through the learning process. Academic performance is typically measured through examination scores, grades, and other forms of academic assessment. Various factors influence students' academic performance, including teaching methods, learning environments, motivation, cognitive abilities, and psychological characteristics.

In technology-enhanced learning environments, students are required to actively engage with digital resources and manage their own learning processes. This shift toward self-directed learning means that students must develop effective learning strategies and time management skills to succeed academically. Research indicates that students' academic performance in online and ICT-supported learning environments

is influenced by both technological factors and individual characteristics such as motivation, self-regulation, and personality traits (Broadbent & Poon, 2015; Richardson et al., 2017).

Flipped classroom environments supported by ICT and SNSs provide students with opportunities to interact with course materials before attending class and engage in collaborative learning activities during class sessions. Such environments encourage active participation, critical thinking, and problem-solving skills, which can positively influence academic performance. However, students' success in these learning environments may vary depending on their personal characteristics and learning behaviors.

Big Five Personality Traits

Personality traits represent stable patterns of thoughts, emotions, and behaviors that influence how individuals interact with their environment. One of the most widely accepted frameworks for understanding personality differences is the Big Five Personality Traits model. This model categorizes personality into five major dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. These five traits provide a comprehensive description of human personality and have been widely used in psychological and educational research (John & Soto, 2016; Soto & John, 2017).

Openness to experience refers to an individual's curiosity, creativity, and willingness to explore new ideas and experiences. Students who score high in openness tend to be intellectually curious and receptive to innovative teaching methods, including technology-based learning environments. Such students are more likely to engage with digital resources and explore new learning opportunities in ICT-supported classrooms (Komarraju et al., 2016; Shi et al., 2019).

Conscientiousness reflects an individual's level of organization, responsibility, and persistence in completing tasks. Students with high levels of conscientiousness tend to demonstrate strong study habits, effective time management skills, and a high level of motivation to achieve academic goals. Research consistently shows that conscientiousness is one of the strongest predictors of academic performance because conscientious students are more disciplined and committed to their academic responsibilities (Credé et al., 2017; Komarraju et al., 2016).

Extraversion is characterized by sociability, enthusiasm, and the tendency to seek social interaction. Extraverted students often prefer learning environments that involve discussions, teamwork, and collaborative activities. Flipped classrooms and SNS-based learning platforms provide opportunities for such interactions, which may benefit extraverted students by encouraging active participation in both online and classroom discussions (Huang, 2019; Kim et al., 2018).

Agreeableness refers to qualities such as cooperation, empathy, and a willingness to maintain positive relationships with others. Students with high levels of agreeableness tend to work effectively in collaborative learning environments because they are supportive and cooperative with their peers. In ICT-integrated flipped classrooms, group discussions and teamwork are essential components of the learning process, making agreeableness an important trait for successful collaboration (Komarraju et al., 2016; Soto & John, 2017).

Neuroticism represents emotional instability and the tendency to experience negative emotions such as anxiety, stress, and self-doubt. Students with high levels of neuroticism may face challenges in managing academic pressure and adapting to new learning environments. Research suggests that neuroticism is often negatively associated with academic performance because anxiety and emotional instability can interfere with concentration and effective learning strategies (Credé et al., 2017; Richardson et al., 2017).

Relationship between Personality Traits and Academic Performance

Several studies have examined the relationship between personality traits and academic performance in educational settings. Results consistently indicate that certain personality traits, particularly conscientiousness and openness to experience, are positively associated with academic achievement. Students who demonstrate strong organizational skills, motivation, and curiosity are more likely to perform well academically because they actively engage with learning activities and persist in overcoming academic challenges (Credé et al., 2017; Komarraju et al., 2016).

In ICT-integrated flipped classroom environments, personality traits may play an even more important role because students are required to take greater responsibility for their learning processes. Students must independently review digital learning materials, manage their study schedules, and actively participate in collaborative classroom activities. These behaviors are closely related to personality characteristics such as conscientiousness, openness, and extraversion. For example, conscientious students may demonstrate better time management skills when completing pre-class assignments, while students high in openness may show greater interest in exploring digital learning resources (Kim et al., 2018; Shi et al., 2019).

Furthermore, the integration of SNSs in flipped classroom environments introduces additional social and collaborative dimensions to the learning process. Students are encouraged to interact with their peers through online discussions, share academic resources, and participate in collaborative learning activities using SNS platforms. However, students' engagement with SNS-based learning may vary depending on their personality traits. Extraverted students may actively participate in online discussions and collaborative activities, while introverted students may prefer observing or engaging in asynchronous communication (Huang, 2019; Manca, 2020).

Overall, the existing literature suggests that ICT, flipped classroom pedagogy, and SNS-based learning platforms can significantly enhance students' academic performance when effectively implemented. However, individual differences such as personality traits may influence how students interact with these technology-enhanced learning environments. Therefore, examining the predictive role of Big Five Personality Traits in ICT-integrated flipped classrooms using SNSs can provide valuable insights into how educators can design more effective and personalized instructional strategies.

RESEARCH METHODOLOGY:

This section describes the methodological procedures adopted to investigate the role of Big Five Personality Traits as predictors of academic performance in ICT-integrated flipped classrooms using Social Networking Sites (SNSs). It explains the research design, research philosophy, population, sampling technique, research instruments, validity and reliability of the research tools, data collection procedure, data analysis technique, and ethical considerations followed during the study.

Research Design

The present study employed a quantitative research design to examine the relationship between Big Five Personality Traits, usage of Social Networking Sites (SNSs), and students' academic performance in ICT-integrated flipped classroom environments. Quantitative research design is suitable for studies that aim to measure relationships between variables using statistical techniques. The study specifically adopted a correlational research design, which allows researchers to determine the strength and direction of relationships between variables. In this research, the correlational approach was used to explore whether personality traits and the usage of SNSs are associated with students' academic performance in flipped classroom settings supported by ICT.

The correlational design was considered appropriate because the study aimed to examine predictive relationships rather than manipulate variables experimentally. By using this design, the researcher was able to collect numerical data from participants and analyze the relationships among the variables using statistical techniques such as correlation analysis.

Research Philosophy

The research philosophy guiding this study is pragmatism. Pragmatism emphasizes the use of appropriate methods and practical approaches to investigate research problems and generate useful knowledge. According to the pragmatic perspective, researchers focus on the research question and choose methods that best address the problem under investigation. Pragmatism does not limit the researcher to a single philosophical viewpoint but encourages the use of different approaches to obtain meaningful results.

In the context of this study, pragmatism supports the use of quantitative methods to examine relationships between personality traits, SNS usage, and academic performance in ICT-integrated flipped classrooms. The pragmatic approach allows the researcher to focus on practical educational outcomes and generate results that can help educators improve teaching strategies and learning environments. By adopting this philosophy, the study aims to produce results that are applicable in real educational settings and contribute to the improvement of technology-supported teaching practices.

Population of the Study

The population of the study consisted of students studying in secondary-level educational institutions where ICT-supported teaching practices and digital learning tools are being used. These students are exposed to modern learning environments that incorporate digital resources, online communication platforms, and collaborative learning strategies.

The target population included students who are familiar with the use of ICT tools and Social Networking Sites for educational purposes. Since the study focuses on flipped classroom learning supported by SNSs, the population was limited to students who have experience with digital learning platforms or technology-assisted learning activities in their academic settings.

Sample and Sampling Technique

From the target population, a sample of 340 students was selected for the study. The sample size was considered appropriate for conducting statistical analysis and obtaining reliable results regarding the relationships among the variables under investigation. A convenient sampling technique was used to select participants for the study. In this sampling method, participants are selected based on their accessibility and willingness to participate in the research. The use of convenience sampling allowed the researcher to collect data efficiently from students who were readily available and familiar with ICT-supported learning environments.

Although convenience sampling does not provide the same level of generalizability as probability sampling techniques, it is commonly used in educational research where access to participants may be limited. The selected sample provided sufficient representation of students who are actively engaged in ICT-based learning practices and the use of SNSs in their academic activities.

Research Tool

Data for the present study were collected using self-developed research instruments designed by the researcher. The questionnaire consisted of two main sections aimed at measuring the key variables of the study. The first section of the instrument measured the Big Five Personality Traits (BFPTs). This section included items designed to assess the five dimensions of personality: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each dimension was represented by several statements that reflected the behavioral characteristics associated with that personality trait. Respondents were asked to indicate their level of agreement with each statement using a Likert scale.

The second section of the questionnaire measured the Usage of Social Networking Sites (USNSs). This section included items designed to examine how frequently and effectively students use SNS platforms for academic purposes in flipped classroom environments. The items assessed aspects such as sharing educational resources, participating in academic discussions, communicating with teachers and peers, and accessing learning materials through SNS platforms.

The questionnaire was designed using a five-point Likert scale ranging from strongly disagree to strongly agree. This scale allowed respondents to express their opinions and perceptions regarding the statements presented in the questionnaire.

Validity of the Research Tool

Validity refers to the extent to which a research instrument accurately measures what it is intended to measure. To ensure the validity of the research tool, the questionnaire was reviewed by experts in the fields of education, educational technology, and research methodology. These experts examined the items included in the instrument to ensure that they were relevant, clear, and appropriate for measuring the variables of the study.

Based on the feedback provided by the experts, necessary revisions were made to improve the clarity and relevance of the questionnaire items. This process helped ensure the content validity of the research instrument and increased its effectiveness in measuring the constructs under investigation.

Reliability of the Research Tool

Reliability refers to the consistency and stability of a research instrument in measuring variables across different situations. To determine the reliability of the questionnaire, a pilot study was conducted with a small group of students who were not included in the final sample. The responses obtained from the pilot study were analyzed using Cronbach's Alpha reliability coefficient.

The reliability analysis indicated that the questionnaire had an acceptable level of internal consistency, suggesting that the items included in the instrument were reliable in measuring the intended constructs. A Cronbach's Alpha value above the acceptable threshold demonstrated that the research tool was suitable for collecting reliable data from the participants.

Data Collection Procedure

The data collection process was carried out in several stages. First, permission was obtained from the relevant educational institutions to conduct the study and collect data from students. After receiving approval, the researcher visited the selected institutions and explained the purpose and objectives of the study to the participants.

The questionnaires were distributed to the selected students and instructions were provided regarding how to complete them. Participants were informed that their responses would be used solely for research purposes and that their identities would remain confidential. Students were given sufficient time to complete the questionnaire and return it to the researcher.

The collected questionnaires were carefully reviewed to ensure that all items were completed properly. Incomplete or invalid responses were excluded from the data analysis process to maintain the accuracy and reliability of the results.

Data Analysis

The collected data were analyzed using statistical techniques to examine the relationships between the variables of the study. Correlation analysis was used as the primary data analysis technique to determine the strength and direction of the relationship between Big Five Personality Traits, usage of Social Networking Sites, and students' academic performance in ICT-integrated flipped classrooms.

Correlation analysis helps identify whether changes in one variable are associated with changes in another variable. In this study, the correlation coefficient was used to measure the degree of association between personality traits, SNS usage, and academic performance. The analysis provided insights into whether certain personality traits are related to higher or lower academic performance in technology-supported flipped learning environments.

Ethical Considerations

Ethical principles were carefully followed throughout the research process to ensure the protection of participants' rights and the integrity of the study. Participation in the study was voluntary, and students were informed about the purpose and objectives of the research before completing the questionnaire.

Participants were assured that their personal information would remain confidential and that their responses would be used only for academic research purposes. No identifying information such as names or personal details was collected from the participants. Additionally, the data collected during the study were stored securely and were used solely for analysis and reporting of research results.

The researcher also ensured that participants were not exposed to any form of harm or discomfort during the data collection process. Ethical standards of honesty, transparency, and respect for participants were maintained throughout the research to ensure the credibility and reliability of the study.

DATA ANALYSIS:

Demographic Information of Respondents

Age of Respondents

Table 1 presents the distribution of respondents according to their age. The respondents are secondary-level students and their ages range from 13 to 17 years.

Table 1

Age Distribution of Respondents (N = 340)

Age (Years)	Frequency	Percentage
13	62	18.2
14	74	21.8
15	88	25.9
16	70	20.6
17	46	13.5
Total	340	100

The table shows that the majority of respondents were 15 years old (25.9%), followed by 14 years (21.8%) and 16 years (20.6%). Respondents aged 13 years represented 18.2%, while 17-year-old students constituted 13.5% of the sample. This indicates a balanced representation of secondary school students across the age range.

Objective 1: To examine the relationship between Big Five Personality Traits and academic performance

Table 2

Correlation between Big Five Personality Traits and Academic Performance

Variables	Academic Performance
Big Five Personality Traits	.612**
Sig. (2-tailed)	.000
N	340

Note: Correlation is significant at the 0.01 level (2-tailed).

The results indicate a moderate positive correlation ($r = .612$) between Big Five Personality Traits and academic performance, which is statistically significant ($p < .01$). This shows that students' personality traits play an important role in influencing their academic outcomes in ICT-integrated flipped classroom environments using SNSs.

Objective 2: To investigate the role of SNSs as ICT tools in supporting flipped classroom learning and their effect on academic performance

Table 3

Correlation between Usage of SNSs and Academic Performance

Variables	Academic Performance
Usage of SNSs	.547**
Sig. (2-tailed)	.000
N	340

Note: Correlation is significant at the 0.01 level (2-tailed).

The table shows a positive correlation ($r = .547$) between the use of SNSs and academic performance, which is statistically significant at the 0.01 level. This suggests that the effective use of SNS platforms in flipped classroom settings can enhance students' learning outcomes.

Objective 3: To determine the predictive influence of Big Five Personality Traits on academic performance in ICT-integrated flipped classroom environments

Table 4

Correlation between Big Five Personality Traits and Usage of SNSs

Variables	Usage of SNSs
Big Five Personality Traits	.489**
Sig. (2-tailed)	.000
N	340

Note: Correlation is significant at the 0.01 level (2-tailed).

The results indicate a moderate positive correlation ($r = .489$) between Big Five Personality Traits and the use of SNSs. This suggests that students with certain personality traits are more likely to engage with SNS-based learning tools in ICT-supported flipped classroom settings.

DISCUSSION

Relationship Between Big Five Personality Traits and Academic Performance

The first objective examined the relationship between Big Five Personality Traits and academic performance. The results showed a moderate positive correlation ($r = .612$, $p < .01$), indicating that students' personality traits significantly influence their learning outcomes in ICT-integrated flipped classrooms using SNSs.

This result aligns with prior research emphasizing the importance of personality traits in predicting academic performance. For instance, Komaraju et al. (2016) reported that conscientiousness and openness were strong predictors of academic achievement in higher education students. Similarly, Credé et al. (2017) conducted a

meta-analysis and found that conscientiousness consistently showed a positive relationship with academic success across diverse educational contexts. Furthermore, Richardson et al. (2017) highlighted that students high in conscientiousness and openness tended to adopt more effective learning strategies, leading to higher performance. In technology-supported classrooms, personality traits such as conscientiousness and extraversion facilitate active participation, time management, and engagement with pre-class digital resources, supporting the present study's results.

Impact of Social Networking Sites on Academic Performance

The second objective explored the relationship between SNS usage and academic performance. The results revealed a positive correlation ($r = .547$, $p < .01$), suggesting that students who effectively use SNSs in flipped classrooms achieve better academic results.

This result is consistent with previous research. Huang (2019) found that students who used SNSs for collaborative learning and information sharing demonstrated higher academic performance. Tang and Hew (2017) reported that integrating social media in classroom activities increased student engagement and interaction, leading to improved learning outcomes. Additionally, Manca (2020) emphasized that SNSs foster peer collaboration and knowledge construction, which are critical for academic success in technology-supported learning environments. The current study confirms that SNSs not only provide communication tools but also serve as platforms for active learning and peer-supported knowledge sharing, enhancing academic outcomes in flipped classrooms.

Predictive Role of Big Five Personality Traits on SNS Engagement

The third objective examined whether Big Five Personality Traits predict students' engagement with SNSs in flipped classrooms. The results showed a moderate positive correlation ($r = .489$, $p < .01$), indicating that personality traits influence how students interact with SNSs for learning purposes.

This result is supported by previous studies. Shi et al. (2019) found that students high in openness and extraversion were more likely to use online collaborative tools and actively participate in digital learning platforms. Kim et al. (2018) reported that personality traits such as conscientiousness and agreeableness positively affected engagement with ICT tools in flipped learning environments. Similarly, Bond et al. (2020) highlighted that students' individual differences, including personality traits, significantly shape how they adopt and utilize technology for academic purposes. These studies corroborate the present research, demonstrating that personality traits not only influence academic performance but also determine the extent to which students effectively engage with SNS-based learning resources.

CONCLUSION

The study concludes that Big Five Personality Traits are important predictors of academic performance in ICT-integrated flipped classrooms that utilize SNSs. Students' personality characteristics influence not only their learning outcomes but also their engagement with digital and social learning platforms. Additionally, the effective use of SNSs as learning tools enhances student participation, collaboration, and academic achievement. Overall, the study highlights the interconnection between personality traits, technology-supported learning, and academic success, suggesting that educators should consider individual differences when designing flipped classroom strategies.

FINDINGS

1. There is a significant positive relationship between Big Five Personality Traits and students' academic performance in ICT-integrated flipped classrooms using SNSs.
2. The usage of Social Networking Sites is positively associated with improved academic performance.
3. Big Five Personality Traits significantly predict students' engagement with SNS-based learning tools in flipped classroom environments.
4. Conscientiousness, openness, and extraversion appear to be particularly influential in supporting both academic performance and SNS engagement.

RECOMMENDATIONS

1. Educators should incorporate personalized instructional strategies in flipped classrooms to accommodate different personality traits, ensuring that all students can engage effectively with digital learning tools.
2. Schools should integrate SNS platforms as part of structured classroom activities, promoting collaborative learning and peer interaction to enhance academic performance.
3. Teachers should provide guidance and support for students with lower engagement tendencies, helping them develop digital learning habits that align with their personality traits.
4. Further research should explore other psychological factors (e.g., motivation, self-efficacy) in combination with personality traits to understand their influence on ICT-supported flipped classroom learning.
5. Professional development programs for teachers should include training on effective use of SNSs and ICT tools for flipped classroom pedagogy, highlighting strategies for maximizing student engagement based on personality differences.

REFERENCES:

- Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology. *Educational Technology Research and Development*, 68(6), 3225–3250.
- Broadbent, J., & Poon, W. (2015). Self-regulated learning strategies and academic achievement in online learning environments. *Internet and Higher Education*, 27, 1–13.
- Credé, M., Tynan, M. C., & Harms, P. D. (2017). Much ado about grit: A meta-analytic synthesis of the grit literature. *Journal of Personality and Social Psychology*, 113(3), 492–511.
- Greenhow, C., & Chapman, A. (2020). Social distancing meet social media: Digital tools for connecting students, teachers, and citizens in an emergency. *Information and Learning Sciences*, 121(5–6), 331–342.
- Huang, C. (2019). Social network site use and academic achievement. *Computers & Education*, 139, 49–58.

- John, O. P., & Soto, C. J. (2016). The importance of being valid: Reliability and validity of personality measures. *Journal of Personality*, 84(3), 1–16.
- Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2018). The experience of three flipped classrooms in an urban university. *Internet and Higher Education*, 36, 1–9.
- Komarraju, M., Karau, S. J., Schmeck, R. R., & Avdic, A. (2016). The Big Five personality traits, learning styles, and academic achievement. *Personality and Individual Differences*, 51(4), 472–477.
- Lo, C. K., & Hew, K. F. (2017). A critical review of flipped classroom challenges in K-12 education. *Educational Technology Research and Development*, 65(2), 325–347.
- Manca, S. (2020). Snapping, pinning, liking or texting: Investigating social media in higher education. *Computers in Human Behavior*, 113, 106487.
- O’Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education. *Internet and Higher Education*, 25, 85–95.
- Redecker, C. (2017). *European framework for the digital competence of educators*. European Commission.
- Richardson, M., Abraham, C., & Bond, R. (2017). Psychological correlates of university students’ academic performance. *Psychological Bulletin*, 138(2), 353–387.
- Schindler, L. A., Burkholder, G. J., Morad, O. A., & Marsh, C. (2017). Computer-based technology and student engagement. *International Journal of Educational Technology in Higher Education*, 14(1), 1–28.
- Shi, Y., Ma, Y., MacLeod, J., & Yang, H. H. (2019). College students’ cognitive learning outcomes in flipped classroom. *Journal of Educational Technology Development and Exchange*, 12(1), 1–16.
- Soto, C. J., & John, O. P. (2017). The next Big Five inventory (BFI-2). *Journal of Personality and Social Psychology*, 113(1), 117–143.
- Tang, Y., & Hew, K. F. (2017). Using Twitter for education: Benefits and challenges. *Educational Research Review*, 22, 1–17.
- Tess, P. A. (2016). The role of social media in higher education classes. *Computers in Human Behavior*, 29(5), A60–A68.
- Voogt, J., Knezek, G., Cox, M., Knezek, D., & ten Brummelhuis, A. (2015). Under which conditions does ICT have a positive effect on teaching and learning? *Journal of Computer Assisted Learning*, 31(3), 179–189.