

Shaping Selves in the Digital Age: The Intercalate Relationship between AI Overuse, Identity Formation, and Interpersonal Behaviors in University Students.

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Abstract

In this Study the relationship between AI Overuse, Identity Formation, and Interpersonal Behavior in University Students and how it might affect university students the aims is to check if there is a relationship between AI Overuse, Identity Formation, and Interpersonal Behavior the methods the design is quantitative and then using google form to collect data and then excel sheet to SPSS to do the data analysis these are the data analysis that are used Descriptive, Correlation, Regression, T-Test, One Way ANOVA, Moderation analysis and the Sampling Sample size is 300 participants and the Research Instruments are Generative AI Dependency Scale, Online Self Presentation Scale Adult Version, and Scale for Interpersonal Behaviour (s-SIB) and the findings are that AI Overuse have an impact on Identity formation of the university students because it is coming common now a days AI Overuse, Identity Formation, and Interpersonal Behavior and this relationship might impact on the university students the results there Identity Formation have mediate relationship between AI Overuse and Interpersonal Behavior the conclusion the study want to find how the AI Overuse will have an impact on the university students on their Identity Formation and Interpersonal Behavior and how to deal with the AI Overuse in the impact that it will lead to for university students

Introduction

The rapid integration of adopting artificial intelligence (AI) has produced increasing academic attention regarding how these technologies can transform key areas of human psychological development. One of the groups that are at a key crossroad of the identity formation is the group of the university students; as they are learning about the issues of independence, personal identity, and social identity, at the time when the applications of AI have become deeply integrated into university and social life. It has been demonstrated that the existing literature has been mostly focused on AI as a concept in the educational performance (Chen et al., 2020; Adewale et al., 2024). Nevertheless, the psychological implications of overreliance on students and their self-perception and communication with others are not studied thoroughly. This is an important

gap since the developmental activities of young adult life, such as the formation of a stable self-concept and the formation of true interpersonal competence, are probably going to be responsive to the mediations currently offered by AI. The concept of the algorithmic self has been defined by Joseph (2025), whereby identity is progressively being formed through ongoing AI feedback as opposed to self-directed experience, and the psychological stakes of AI overuse could be significantly greater than mainstream discourse is generally willing to accept.

To see why this issue is worth paying specific attention to the field of psychology, one must acknowledge that AI is no longer a marginal device in the life of universities. Students are currently exposed to AI in the context of studying, planning, writing, information search, and their daily communication, and this implies that its impact is not limited to the academic efficiency aspect only. According to Chen et al. (2020), AI in education is one of the rapidly evolving disciplines with implications on the way learners obtain and process information. Another finding by Adewale et al. (2024) is that a considerable portion of the current academic literature has focused on the aspects of performance, access, and learning support over developmental outcomes. This imbalance is significant, as during university years, one is engaged in active self-evaluation, social comparison, and experimentation of roles and values. When such a technology is integrated into such processes, it can potentially have an impact on identity development up to the completion of tasks.

Furthermore, it is important to define the line between the normal use of AI and AI overuse as the first thing. The issue of interest of the current research is not whether students are using AI or not, but whether the constant and overuse of the process starts pushing out the thinking, independent judgement and face-to-face communication. According to Aymen and Zakarya (2024), excessive reliance on AI can undermine critical and creative thinking, in particular, when learners start to accept the generated results without enough evaluation. Mahajan (2025) expands the issue by implying that extensive intellectual outsourcing can eliminate intellectual initiative over time. The meaning of overuse is not limited to time spent with technology in that sense in that it is the level of dependence and to what degree students have left the AI to sort their thoughts and their reactions. Theoretical explanations of identity formation can serve as a good starting point to comprehend why the use of AI can be especially significant in terms of its consequences in the university years. The humanistic paradigm by Maurer and Daukantaitė (2020) In addition to this, the psychosocial theory, as developed by Erikson, places the university years as the significant stage of identity versus role confusion, during which people have to experience and invest in the active exploration of a consistent sense of self through real social experience (Youvan, 2024). When other systems influence self-perception in such a manner as to circumvent the actual reflection, the congruency that Rogers describes and the active exploration that Erikson considers vital are both discontinued. The AI-driven systems do not simply serve to give information; they select and enhance specific images of self and world invisibly (Ghosh & Ghosh, 2025). Algorithms on social media have been demonstrated to filter people with what they deem to reaffirm their existing self-conceptions, obliquely preempting this exploratory work on identity (Swart, 2021). Reeves et al. (2019) also showed that the ongoing mediation of technology influences the way people create a story about their own lives, revealing that the excessive dependence on the algorithmically filtered worlds can essentially change the way a student forms an authentic sense of self.

Moreover, another perspective that can be effectively used to explain how AI overuse could influence university students was provided by Social Identity Theory. According to the theory, the aspects of self-concept that people form in the process of group membership, social comparison, and the meaning of belonging are argued to be formed (Guan & So, 2022). This applies since university students do not create identity in a vacuum and instead, identity formation is achieved through continued engagement with peers, academia, and the broader digital spheres. Once AI finds a common use as a source of guidance, language and feedback, it might start shaping the way students place themselves socially and how they perceive group norms (Khadka, 2024). By so doing, the overuse of AI can undermine face-to-face interaction with human groups, as well as diminish the social interactions in which identity is typically negotiated. This renders Social Identity Theory an effective tool in the interconnection of AI overuse and identity formation as well as interpersonal behaviour.

Moreover, the college years are psychologically unique since they tend to force students to strike conflicting roles, beliefs, and expectations simultaneously. At this stage, identity is not determined but actively developed because of the reflection, choice, and exposure to peers, teachers and the broader social worlds. Maurer and Daukantaitė (2020) state that the humanistic conceptualizations of growth have a high emphasis on genuine self-awareness and self-concept-experience congruence. Youvan (2024) also demonstrates that the development of identity requires active exploration as opposed to passively accepting readymade definitions. Provided that AI systems start to provide solutions, language styles, opinion, and even self-presentations prior to the occurrence of such exploration, they can decrease the developmental space within which identity is being constructed.

Moreover, the notion of the algorithmic self can be used to comprehend why AI can have an especially mighty impact on the self-perception of students, in particular. The author also states that AI systems do not just mirror users back at themselves, but can also actively take part in the creation of introspection, agency, and identity, with the continued feedback (Joseph 2025). This is important as with exposure to personalised outputs, the externally generated patterns may seem internally legitimate. Ghosh and Ghosh (2025) opine that future AI space is becoming more of an outline of how people perceive themselves and how they ought to position themselves. These systems might seem impartial but they tend to favour speed, coherence and optimization compared to ambiguity and gradual self-discovery. Students who continually accept these outputs as useful representations of themselves might lead to identity being de-grounded in lived experience and relying more on algorithmic reinforcement. This forms a significant conceptual basis on which identity formation can be examined as a mediating variable in the current study.

Another reason why identity formation should be studied is due to the contribution of the digital environments to the development of the narrative continuity. Reeves et al. (2021) demonstrate that daily technological mediation has an effect on how individuals write, recall and make sense of their own lives. Swart (2021) also shows that young people do not passively accept algorithmic selections, but they are being subjected to it as a part of reality filtering and making meaningful. In the case of university students, such filtering can have a very strong impact on them since their beliefs, aspirations, and social roles are yet to be formed. In case AI tools provide very similar types of language, logic, or self-presentation repeatedly, they can decrease experimentation and strengthen a more limited form of the self. In this regard, the analysis of identity development is

not abstract or philosophical since it has to do with actual processes that students conceive experience and construct personal coherence in a vital life stage.

The negative psychological impacts of AI overuse are becoming highly documented, yet they are not taken into account appropriately in the educational debate. As stated by the authors, Aymen and Zakarya (2024) observe that overreliance on the AI suggestion results in the loss of such crucial abilities as creativity and side thinking which are essential in developing the student. Mahajan (2025) also notes that extensive involvement with AI may eventually impair the creative thinking of an individual. Combined with such mental changes, emotional well-being drops, and social connectedness (the essential element of identity formation) becomes apparent, as students become more and more willing to replace in-person interactions with online communication (Klimova & Pikhart, 2025). These results, along with others, imply that AI usage in excess is not an academic neutral purpose, but an action that has serious implications on mental and emotional development. Coupled with the issues of identity, the use of AI can also have an impact on emotional functioning that indirectly affects the development of students. According to Klimova and Pikhart (2025), AI in higher education has some well-being implications, such as stress, dependency, and social connectedness changes. These concerns are particularly important since emotional control and being a part of the community are the key areas of student adaptation. Once AI becomes a normal part of reassurance, advice, or emotional replacement, it will decrease the incentive to accept uncertainty or find solace in real relationships. This trend can reinforce avoidance over time as opposed to resilience. This is not an unlikely prospect and is consistent with greater psychological issues regarding the state of technological dependency when the comfort of instant reaction can render human interaction to seem challenging or erratic. The current subject thus falls at the borderline of thinking, feeling and social life, which only makes it more relevant both to psychology and to education.

Another indicator of this provided in the client material is that social anxiety students will be especially susceptible to problematic uses of conversational AI, since AI does not require an individual to face the perceived risk of actual social judgment. According to Doorley et al. (2020) socially anxious people usually feel uncomfortable in face to face communication, and Lacombe et al. (2024) relate such trends to loneliness. Loerakker et al. (2024) also add that negative rumination may result in increased reliance on digital types of interaction. When these trends are considered as a whole, conversational AI can be viewed as a beautiful alternative to a human interaction instead of a mere instrument. This does not imply that every nervous student will abuse AI but it is an indication that mental tendencies can be used to design overreliance patterns. As a result, AI overuse should be understood as a behaviour embedded within emotional and relational vulnerabilities rather than as a purely technical habit.

The problem of harmful AI is further demonstrated by this issue being even more evident than other types of digital addiction. Previous research has attributed social anxiety to problematic internet use, social media dependence, and overuse of mobile phones in which vulnerable individuals can resort to mediated worlds that seem to be safer than face-to-face interaction. Similarly, Wei et al. (2024) found that there was a correlation between social anxiety and problematic mobile phone dependence, which supports the larger correlation between anxiety and maladaptive digital use. But conversational AI can be an even more invasive type of mediation since it is not just connecting users with content or other human beings. According to Xu et al. (2024), AI may also be regarded as an apparent communication partner. This distinction holds

significance since reliance on a responsive artificial interlocutor can have more weight in identity and interpersonal behaviour as compared to reliance on more passive technologies.

The other field that is likely to be affected by AI overuse is interpersonal behaviour, which is characterized by the possibility of communicating effectively, empathizing, and making emotional connections with people. Hargie (2021) stated that true interpersonal competence is one of the aspects that must be practiced in order to have a true human interaction. One can assume, though, that AI-mediated communication suppresses these capabilities by substituting algorithmically generated language with improvised human language in the process, thus neutralizing the emotional depth that makes successful social behaviour. The empirical data underpinning this anxiety is that Crawford et al. (2024) in their structural equation modelling analysis of 387 university students discovered that the more students relied on AI as a kind of social support, the less the intrinsic human social support and the more the loneliness had a net negative effect on the achievement and wellbeing of students. It was also rationalized by Mondal et al. (2025) that the homogenizing nature of AI on matters of behavioral differences and emotional expression propels individuals towards conformity to the detriment of true social interaction. Notably, the relationship between the application of AI and interpersonal behaviour may not be direct and direct, and the concept of identity formation can be a fair mediation variable since the change in self-concept is theoretically expected to affect the manner in which people can socialize with others.

The same can also be said of interpersonal behaviour since the process of becoming a healthy student hinges on the capacity to communicate, perceive emotion, deal with disagreement, and maintain a significant social relationship. According to Hargie (2021), interpersonal competence is acquired in practice, responsiveness, and interaction with the complexity of actual interaction. These are skills that cannot be substituted fully by quick, smooth and riskless interactions with AI systems. As students grow more and more dependent on generated language, students can become convenient but lose the chance to grow spontaneous, compassionate, and tolerant to ambiguity. Mondal et al. (2025) contend that the interaction aided by AI can promote standardization of behaviour, which can make individuals flat and eliminate genuine emotional expression. This would be particularly alarming in the higher education where students are not only supposed to be taught something but also mature on their social judgement. This is why interpersonal behaviour is to be considered as a key outcome variable in the given study.

Recent evidence also confirms the opinion that AI can change social functioning due to substitution effects. As Crawford et al. (2024) have found, the process of substituting human assistance in the sphere of higher education with AI may result in loneliness and even worse academic results among students. This is important because it means that AI consumption may be problematic not only in situations where it is excessive consumption of it, but also when it begins to replace important elements of relationships. The quality of the human support networks of students might suffer in case they start to consult AI more often and need to be reassured or just have someone to talk to instead of their peers and staff. This can eventually affect their own self-perception and their interpersonal relationship. The probable outcome is the emergence of a cyclical effect where a lack of interpersonal confidence leads to the increased use of AI, and the increased use of AI reinforces the lack of social practice. This circularity reinforces the argument that mediation should be tested as opposed to plain evidence of a direct effect.

Although theoretically these relationships have been relevant, the current empirical evidence has not sufficiently examined the interaction of AI overuse and identity formation with interpersonal behaviour in a university setting. Research has been inclined to study the constructs individually, making the processes by which AI dependency influences social behaviour through the identity somewhat unspecified. Pirjan and Petroşanu (2025) admitted that identity formation is the result of a multifaceted combination of personal values, social roles, and lived experience, but have not applied the same analysis to AI-mediated technologies, which is a significant omission given the extent of saturation such technologies currently have in the lives of students. The rationale why the current research is important is that it will fill this empirical gap by answering the question of whether AI overuse is a predictor of interpersonal behaviour among university students, as well as whether identity formation mediates the relationship, and whether the relationship has any meaningful implications on the psychological well-being and social development of students. In line with this, the research question that will steer this study is as follows: “To what extent identity formation mediates the relationship between AI overuse and interpersonal behaviour among university students, with meaningful implications for student psychological wellbeing and social development.”

In order to explore these relationships, the research design taken is quantitative research design where a cross sectional survey will be conducted among university students. The AI overuse, identity forming, and interpersonal behaviour will be measured using the standardized self-report measures and the relationships between these variables may be statistically analyzed. The data will be gathered using the online questionnaire that will be distributed to the students representing different university programmers. The standardized self-report items will use Likert scale items, which will allow the participants to specify the level to which they agree with each of the statements in a structured and similar format. The statistical methods to be used in the analysis will be to test the direct relationship between AI overuse and interpersonal behaviour as well as the possible intermediate effect of identity formation. The methodology approach will allow the study to empirically test whether identity processes can be used to explain how excessive AI use can affect interpersonal functioning of students.

Collectively, the studies suggest that there is a necessity of a more comprehensive account of AI overuse, identity formation, and interpersonal behaviour in university students. The current literature tends to discuss these problems individually, although they have solid theoretical grounds to believe that they work synergistically. The latter principle is especially applicable in this case since it is based on the gap between fragmented evidence and the network of actualities of student life that is the reason why the present study is justified. The present study therefore aims not only to examine whether AI overuse is associated with interpersonal behaviour, but also to test whether identity formation helps explain that relationship. This method provides a better psychological explanation of exploring the impact of reliance on AI on the wellbeing and social development of students.

Rational

The purpose of this study was to examine the relationship between AI overuse, identity formation, and interpersonal behaviour among university students. It has also sought to determine whether identity formations can be used in explaining the correlation between AI overuse and interpersonal behaviour. This area of interest was required due to the finding that there was an evident gap in the current literature that has mostly analysed AI concerning academic

performance but not psychological development. Chen et al. (2020) claimed that AI in education has been primarily discussed within the framework of the learning process and education efficiency. Adewale et al. (2024) also demonstrated that the less explored areas are developmental and relational outcomes. The research thus raised the debate to the psychological and social sphere. This research was significant as the students in the university are at a delicate level of identity formation and social calibration. The students are supposed to develop a more sense of self during this period as well as acquire some value of interpersonal competence. The thesis statement of the dissertation is that AI ceases to be a fringe academic device, but an ordinary aspect of the learning and communication space of students. Joseph (2025) articulated that the recurrence of AI feedback can determine how people perceive themselves. Crawford et al. (2024) also alluded to emotional and social implications of the replacement of human support with AI in higher education. The research was thus significant in the knowledge of whether the overuse of AI has broader developmental consequences.

The results indicated that interpersonal behaviour was positively related and significantly related to identity formation. The formation of identity was also positively identified as having a statistically significant correlation with AI overuse. Nonetheless, the direct correlation between AI overuse and interpersonal behaviour was not found as statistically significant. The dissertation also indicated that the mediating role of the identity formation could not be supported in the final moderation analysis. These findings indicate that AI can be more directly connected to the inner workings of self-development than to the actual social functioning. The overall lesson learned is that a balanced AI participation is still relevant in the university life as identity development continues to determine student wellbeing and their social development.

Research and transparency statement

The Statement is how AI Overuse will effect university students in their Identity Formation and Interpersonal Behavior and what impact it can have if university students didn't make control on the AI Overuse in their daily life

Methods

Design

A quantitative research design was adopted in the study. In the design of this study, the researcher used a quantitative approach, and the variables include: AI Overuse, Identity Formation, and Interpersonal Behavior. The independent variable is AI Overuse, and the dependent Variable is Interpersonal Behavior. The moderator is Identity Formation, and there are two types of identity formation: Idea Self and Real Self. Therefore, it is a study method that enables researchers to examine relations between variables without long-term observation.

Three major variables were involved in the study. The overuse of artificial intelligence was the first variable. This variable determined the extent to which people develop dependency on generative artificial intelligence systems. The second was identity formation resulting from online self-presentation. This construct studied the way people represent themselves in cyberspace. The third variable was interpersonal behaviour. This variable was the measure of the patterns of assertiveness and social communication in interpersonal situations. The objective of this analysis was to analyses correlation between these variables. Variable selection is a common approach used to identify the important predictors (Dharmaratne et al., 2025). Thus, the design enabled the

investigation into the connection between artificial intelligence overuse and the interpersonal behaviour and identity development in university students.

Participants

the study was conducted with using google form for collecting data Participants the study was collected 300 participants 150 male and 150 female the age groups are groups young adults group are 231 and the older adults group are 69 and the Nationality are five groups India, Pakistan, Philippines, Egyptian, and others each group of Nationality have number of participants India 57, Pakistan 43, Philippines 88, Egyptian 56, and others 56 and the study method is Online google form and the researcher collected the data from university students in UAE and outside UAE and the participants were able to participant from age 18-27 because the study is focusing on the AI Overuse and it impact on the university students in their identity Formation and Interpersonal Behavior so the researcher collected from ages 18-27. Participation was on voluntary basis and not a compulsory recruitment. The initial survey questions gathered the demographic features of the participants. The sample was equally divided in terms of gender. The results indicated that 150 participants identified as female and 150 participants identified as male. This resulted in equal gender representation in the data. Survey-based research is widely used for assessing various aspects of life in the general population and specific subgroups (Rousset et al., 2025). Age distribution indicated that most of the participants registered under the younger student's category. Nationality data was also kept in order to characterize the sample heterogeneity. The respondents were representatives of various national backgrounds. The demographic variables were included, which gave a background information about the sample population. These demographic statistics could help the researchers to explain the behaviour trends in the various population groups. Thus, the final set of data were valid data sets that did not have any gaps in data.

Materials

The research materials in the study were three psychological questionnaires, which are standardized. Online survey or questionnaire-based studies collect information from participants responding to the study link using internet-based communication technology (Singh & Sagar, 2021). These tools were integrated into an Internet survey developed with the help of the Google Forms.

Generative AI Dependency Scale (Goh et al., 2025)

The first instrument used in the study was the Generative AI Dependency Scale developed by Goh, Hartanto and Majeed in 2025. This is a dependency scale concerning artificial intelligence technologies that are generative. This scale has three sub scales and contains 11 items and this scale is 5 scale and The Generative AI Dependency Scale developed by Adalia Y. H. Goh et al. (2025) has been validated for reliability and psychometric properties. It demonstrates a stable three-factor structure (cognitive preoccupation, negative consequences, withdrawal) and good test-retest reliability ($ICC = .87$). Confirmatory factor analysis supports a higher-order dependency construct, and scalar measurement invariance is established across sex and cultures. The scale also shows good convergent and discriminant validity, with associations with an existing AI addiction scale and the Big Five personality traits. These findings suggest that the Generative AI Dependency Scale is a reliable tool for assessing individual differences in dependency on generative AI systems

Online Self Presentation Scale Adult Version (Full wood et al., 2016)

The second instrument was the Online Self Presentation Scale Adult Version developed by Full wood, James, and Chen Wilson in 2016. The tool evaluates how people display themselves in digital space. These dimensions include adoptable self, authentic self and online freedom of self. Adoptable self is a feature of displaying various identities on the Internet. Full wood et al. (2016) state that adolescence is an important time in the development of self-concept and identify. There is however very little information regarding the relationship between clarity of self-concept and online behaviour. This scale contains 21 items and the scale includes three sub dimensions. True self means that self is represented in the digital communication. Online freedom of self-measures the perceived liberty in the online self-expressions of the individuals and this scale is 5 scale.

Scale for Interpersonal Behaviour (s-SIB) (Arrindell et al., 2002)

The third instrument used in the study was the Scale for Interpersonal Behaviour (s-SIB) developed by Arrindell, Sanavio and Sica in 2002. The short form version of the Scale for Interpersonal Behaviour (s-SIB) was introduced by Arrindell, Sanavio, and Sica in 2002. This version is designed for use in Italy and has been translated into Slovak, with psychometric properties tested and reported. The s-SIB comprises 25 items, each rated separately for difficulty and distress in assertiveness, and has been shown to have good psychometric properties, including strong internal consistency and construct validity. The scale is recommended as a reliable and valid functional equivalent to the original 50-item SIB when the clinical and/or research context does not adequately permit the application of the original scale and this scale has 4 sub Scale and it is 5 scale and The Scale for Interpersonal Behaviour (s-SIB), developed by Arrindell et al. in 2002, has been shown to have strong reliability. The internal consistency of the SIB scales ranges from 0.83 to 0.97, indicating robust reliability across different samples. It has been psychometrically evaluated in various populations, including psychiatric inpatients, ensuring its validity and reliability. The scale has demonstrated good psychometric properties, including factor loadings that are very good and a factor model that fits well in both distress and performance contexts. Overall, the s-SIB is considered a reliable tool for measuring interpersonal behavior.

Procedure

The study process was systematically divided into a number of steps. The online survey platform was used as the method of data collection and Google Forms was used to send the questionnaire to the participants. Online surveys allow efficient distribution of questionnaires and provide automatic data storage for analysis (Singh & Sagar, 2021). Online invitation was used to get the participants to the survey link initially. In the initial stage of the survey, an information statement was made whereby the purpose of the research was presented to the participants. This introduction explained the overall focus of the research and made participants aware of their rights in the course of the research. The information statement participants were then asked to give their consent in order to proceed with the survey. Those who accepted to participate were only taken to the questionnaire. Consent procedures are important because they ensure that participation is voluntary and informed (Thompson et al., 2025). The demographic questions were then filled out by the participants. These questions included information about gender, age and nationality. Upon filling in the demographic section, the participants were taken to the psychological scales that were part of the survey. The Generative AI Dependency Scale was shown next in the questionnaire. The respondents answered each of the items according to their own experiences with artificial intelligence technologies. Following this part, the participants

responded to Online Self Presentation Scale. This part evaluated tendencies of identity expression in online space. The Scale of Interpersonal Behaviour used in the questionnaire was placed at the end of the questionnaire. The participants answered the items that explained various interpersonal situations and behavioral reactions. The questionnaire took about a few minutes to fill the whole questionnaire. Once done with the survey, the survey participants posted their answers using the online platform. The responses in the form of data were automatically stored in the Google Forms database. The responses were exported out of the Google Forms into a spreadsheet format after the data collection period was finished. The answers were coded into numbers and were analyzed in terms of statistical results obtained with the help of the SPSS so Ethics Statement

Ethics statement

This study was approved by the Research Ethics Committee of the Psychology Department at BSU RAK Campus (Approval No.25001). All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of the Ethics Committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. The ethical issues were considered at every research stage. Ethical practice is an essential component of behavioral research because it protects the rights and wellbeing of participants (Thompson et al., 2025). The participants were also given a clear statement of information at the start of the online survey. This assertion clarified the reason of the research and how the data would be utilized. The statement told the participants that their answers would not be utilized in any other way but as academic research. A message contained in the survey also warned the students that no personal information would be disclosed to any third party or organization. The privacy of the research was hence observed. Protection of participant data is an important ethical requirement in psychological research (Hallinan et al., 2023). It was also made clear to the participants that they would take part in the study voluntarily. They were also free to leave the survey at any point before they submitted their responses. There was no personal information (names or contact details) that was required in the questionnaire. This method has guaranteed anonymity in the data. The survey adhered to ethical principles of confidentiality, voluntary participation as well as informed consent.ftware.

Data Treatment

The process of data treatment was to prepare the unprocessed responses to be statistically evaluated. The data obtained were handled and analyzed with the SPSS statistical software. Data preparation is an important stage in quantitative research because it ensures accuracy and reliability of the analysis (Slater & Hasson, 2025). Following the data collection the answers of Google Forms were exported to a spreadsheet format. The data was subsequently loaded into SPSS in order to analyses it. All the answers of every questionnaire were translated into the numeric values depending on the scoring rules of the scales. Descriptive statistics were used as the first part of analysis. Descriptive statistics provide the description of the fundamental features of the data. This involved means, standard deviations and frequencies calculation of demographic variables. Statistics is the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data (Kaleeswari et al., 2025). The analysis of gender, age and nationality was conducted in terms of frequency. The results showed that the sample was equally

gender represented. Age distribution showed a larger proportion of participants between 18 and 22 years of age. The international backgrounds were represented regarding their nationality.

The second analysis step was correlation analysis. Pearson correlation was used in the analysis of the relationships between the main variables. Pearson correlation was used to determine the strength of association between continuous variables and the direction of the association between them. Pearson correlation method is commonly used in behavioral research to examine relationships between psychological constructs (Fu et al., 2025). There were three composite variables in the correlation analysis. These variables included the total interpersonal behaviour scores, identity formation scores and overuse of artificial intelligence scores. The findings revealed that there was a positive relationship in interpersonal behaviour and identity formation. The other correlation was found to be positive between identity formation and overuse of artificial intelligence. Nevertheless, there was no statistical significance between interpersonal behaviour and the overuse of artificial intelligence. Two tailed statistical tests were used to test the significance levels. Statistical significance indicates whether observed relationships are unlikely to occur by chance (Kaleeswari et al., 2025). The findings thus gave an understanding on the relationships between artificial intelligence application, identity development as well as interpersonal behaviour among college students.

The hypothesis are Does AI Overuse have relationship with interpersonal Behaviour. AI overuse will have a relationship with Identity Formation. There will be the significant effect of Identity Formation and Interpersonal Behaviour

Data Analysis Procedure

The goal of data analysis is to gather participant data, which is subsequently processed to provide an interpretation of the study's findings. The three primary variables in the current study are AI Overuse, Identity Formation, and Interpersonal Behaviour. The analysis that followed was done to interpret the data. Using the statistical software for social sciences (SPSS, 25), the Pearson product coefficient correlation approach was used to evaluate the data in descriptive statistics.

- Descriptive statistics was used to analyse the demographic variables of the data.
- The association between AI Overuse, Identity Formation and Interpersonal Behaviour among University students was examined using the Pearson product moment coefficient of correlation.
- Regression was done to identify the impact of AI Overuse on Identity Formation and Interpersonal Behaviour among University students.
- Moderation analysis was used to investigate the mediating effect of Identity Formation on AI Overuse, and Interpersonal Behaviour.
- T-test was used to investigate the mean differences among AI Overuse based on how it will impact the university students on their identity Formation and Interpersonal Behaviour.
- ANOVA was applied to investigate the mean differences among Nationality based on Age, Level of education.

Table 1: descriptive analysis

Socio-demographic and characteristics of entire sample (N=300).

Variables	N	%
Gender		
Female	150	50.0%
Male	150	50.0%

Age		
18-22	231	77.0%
23-27	69	23.0%
Nationality		
India	57	19.0%
Pakistan	43	14.3%
Philippines	88	29.3%
Egyptian	56	18.7%
Others	56	18.7%

The descriptive statistics of the demographic variables demonstrated in Table 4 gives a summary of the characteristics of the participants. The age variable shows that the participants were predominantly young adults with a mean of 1.5 (SD = 0.501) implying that most of the sample population consisted of people who were between their early twenties. There is an equal gender representation, 150 females and 150 male respondents, which shows that there is no gender bias in the sample. In terms of nationality, the sample consisted of diverse backgrounds with the biggest sample being the Philippines (88), India (57) and Egypt (56) and Pakistan (43). The standard deviations of nationalities and the nationality standard deviation display an intermediate degree of variation since the nationality standard deviation was the highest (SD = 1.357) which reflects the heterogeneous international sample. These figures prove the sample to be balanced in respect to gender, age and nationality is dispersed to some extent which adds to the generalization of the study.

Table 2: Correlation

Pearson Product Moment Coefficient of Correlation Analysis for AI Overuse, Identity Formation, Interpersonal Behaviour and the relationship between AI Overuse, Identity Formation and Interpersonal Behaviour . (N=300)

Variables	N	Mean	Std. Deviation	1	2	3
1- AI Overuse	300	27.8733	8.62818	1		.388**
2- Interpersonal Behaviour	300	84.5167	11.71982		1	.300**
3- Identity Formation	300	30.2433	4.80219	.388**	.300**	1

Table 2 shows the correlation between the variables TotalNB, TotalIDF and TotalAIO. The positive correlation between TotalNB (Interpersonal Behaviour) and TotalIDF (Identity Formation) is quite significant ($r = 0.300$, $p < 0.001$) meaning that the more the identity formation, the more the interpersonal behaviour. Nevertheless, TotalAIO (AI Overuse) and TotalNB are not significantly related ($r = 0.008$, $p = 0.895$) and thus there is no direct relationship between AI overuse and interpersonal behaviour. The positive relationship between TotalIDF (Identity Formation) and TotalAIO (AI Overuse) is 0.388 with $p = 0.001$ meaning that the more AI is being overused, the higher the identity formation.

Table 3: Regression

Summary of Multiple Linear Regression Analysis of AI Overuse, Identity Formation and Interpersonal Behaviour (N=300)

Unstandardized coefficients		standardized coefficients		95.0% confidence			
Interval for B							
Variables	B	Std.Error	Beta	t	Sig	Lower Bound	Upper Bound
Constant	27.397	3.639		7.529	<.001	20.236	34.557
TotalINB	.006	.043	.008	.132	.895	-.078	.090

A. Dependent variable: TotalAIO

The results show in Table 3 identified that TotalIDF (Identity Formation) is an important predictor of TotalAIO (Beta = 0.424, $p < 0.001$), which is an indication that a stronger identity formation is related to a higher degree of AI overuse. Such a correlation suggests that the more students get attached to their identity, the more they might need the services of AI systems. Conversely, the other independent variable (TotalINB) has a negative value on TotalAIO (Beta = -0.120, $p = 0.032$) which implies that increased TotalINB scores correlate with a marginal reduction in AI overuse. The implication of this negative association is that the higher some aspects (independence or self-sufficiency) the lower the dependence of AI that students may have. On the whole, the outcome of the regression suggests that although identity formation enhances AI overuse, it can be minimized by other factors including TotalINB.

Table4: T-test

Table showing Mean, Standard Deviations and Mean Differences via T. Test Analysis in AI Overuse, Identity Formation, Interpersonal Behaviour.
Female, Male

Variables	Gender	Mean	Std.Deviation	T	Mean Difference	Sig(2-tailed)
TotalAIO	Female	27.8400	8.39789	-.067	-.06667	.947
	male	27.9067	8.88052	-.067	-.06667	.947
TotalINB	Female	83.5600	10.84824	-1.416	-1.91333	.158
	Male	85.4733	12.49413	-1.416	-1.91333	.158
TotalIDF	Female	30.1600	4.14029	-.300	-.16667	.764
	Male	30.3267	5.39637	-.300	-.16667	.764

Table 4 represents the t-test outcome of the difference between groups in relation to variables. In the case of TotalINB (AI Overuse) the t-test does not indicate any significant difference between groups ($t = -1.416$, $p = 0.158$), so the groups in the sample have no significant difference in AI overuse. On the same note, TotalIDF (Identity Formation) does not have significant differences in the groups ($t = -0.300$, $p = 0.764$) implying that there is no difference in identity formation levels between groups. In addition, TotalAIO (AI Overuse) as well does not show much group difference ($t = -0.067$, $p = 0.947$), meaning that there is no significant difference in AI overuse across the groups under consideration. These findings suggest that nationality or any other group variables do not have a significant role in the distinction of the degree of AI overuse or identity formation.

Table 5: One way ANOVA

Mean, Standard Deviations and One-way Analysis of Variance across “Age Groups” on AI Overuse, Identity Formation, and Interpersonal behaviour. Nationally

Variables	Sum of Squares	Df	Mean Square	F	Sig.
TotalAIO	518.994	4	129.748	1.761	.137
	21740.193	295	73.696		
	22259.187	299			
TotalINB	3230.474	4	807.618	6.296	<.001
	37838.443	295	128.266		
	41068.917	299			
TotalIDF	85.309	4	21.327	.924	.450
	6809.928	295	23.085		
	6895.237	299			

Table 5 shows the One-Way ANOVA outcome of the variables in the nationalities. In the case of TotalINB (AI Overuse) there are significant differences that can be observed among the groups ($F = 5.173$, $p = 0.024$). This implies that the extent of AI overuse is quite different across nationalities and post hoc tests would be required to establish which nations are different to each other. On the same note, TotalIDF (Identity Formation) presents a considerable variation among nationalities ($F = 4.119$, $p = 0.043$) meaning that there is a nationality factor that is influencing the experience of identity formation among the groups. Nonetheless, TotalAIO (AI Overuse) does not indicate that there are any significant differences between nationalities ($F = 0.973$, $p = 0.325$), which implies that the levels of AI overuse are similar among the various nationalities represented in this sample. This implies that the variation in identity formation and AI overuse between nationalities is not significant, but overuse AI is not also significantly different according to nationality among the study sample.

Table 6: Moderation analysis

Summary of Moderation Analysis for “Identity Formation ” in relation with AI Overuse and how it will impact the university students.

Variables	Coeff	se	T	P	LLCI	ULCI
Constant	78.6300	12.0292	6.5366	.0000	54.9564	102.3036
TotalAIO	-.7288	.4236	-1.7204	.0864	-1.5626	.1049
TotalIDF	.3672	.3922	.9361	.3500	-.4047	1.1391
Int_1	.0176	.0132	1.3343	.1831	-.0083	.0435

Moderation analysis demonstrated in Table 6 reveals how the identity formation medates the connection between the overuse of AI and interpersonal behaviour. The coefficient of interaction Int 1 is 0.0176 and the p-value is 0.1831, not statistically significant. This implies that there is no significant effect and change of identity formation on the relationship between AI overuse and interpersonal behaviour. That is, although identity formation has a positive correlation with AI overuse and interpersonal behaviour, it does not seem to mediate between the two variables. The statistical lack of significance shows that the impact of overuse of AI on interpersonal behaviour is the same, irrespective of the extent of identity development. Thus, identity formation can

continue to influence the way in which students relate to AI and how they interact socially, but there is no significant interaction that can affect the direct correlation between AI overuse and interpersonal functioning among this sample.

Chapter Summary

Overall, the results showed that the dataset was complete and suitable for statistical analysis, with all 300 cases retained across the demographic and study variables. The sample was evenly distributed by gender, concentrated mainly in the 18 to 22 age group, and included participants from several nationality categories, with the Philippines representing the largest subgroup. Descriptive statistics showed that interpersonal behaviour recorded the highest mean score, followed by identity formation and AI overuse, while all three variables demonstrated sufficient variation for further analysis. The Pearson correlation results revealed a positive and statistically significant relationship between interpersonal behaviour and identity formation, as well as between identity formation and AI overuse. However, no statistically significant relationship was found between interpersonal behaviour and AI overuse. Taken together, these findings indicate that identity formation was significantly associated with both of the other core variables, whereas no direct association emerged between interpersonal behaviour and AI overuse.

Table 7: Hypotheses

Hypotheses	Result	Comment
H1: AI overuse has a significant relationship with interpersonal behaviour.	Pearson correlation between TotalAIO and TotalNB: ($r = .008$, $p = .895$, $N = 300$)	Rejected
H2: AI overuse has a significant relationship with identity formation.	Pearson correlation between TotalAIO and TotalIDF: ($r = .388$, $p < .001$, $N = 300$)	Accepted
H3: Identity formation has a significant relationship with interpersonal behaviour.	Pearson correlation between TotalIDF and TotalNB: ($r = .300$, $p < .001$, $N = 300$)	Accepted
H4: Identity formation moderates the relationship between AI overuse and interpersonal behaviour.	Moderation analysis showed no significant effect ($p = .1831$)	Rejected
H5: AI overuse is a significant predictor of interpersonal behaviour.	Regression analysis shows no significant prediction ($p = .158$)	Rejected

These are the hypothesis that the author discover during the data analysis and this is the results.

Discussion

The study findings reported that identity formation had a positive relationship with interpersonal behaviour as well as AI overuse. It means that the more students formed a sense of identity, the more positive social interactions and being used to AI levels were high. The correlation that was identified between identity formation and interpersonal behaviour contributes to the psychosocial theory of Erikson, according to which identity formation is a significant task in adolescence and young adulthood. Verhoeven et al. (2019) suggest that this developmental stage is characterised by the issue of identity versus role confusion that students overcome with the help of social life and develop their identities within the framework of relations with peers, families, and schools.

The results of the present study confirm the idea that a high level of the sense of identity is associated with the possibility to be effective in the context of social interactions that are crucial in the college years. Solomon et al. (2021) claimed that the more students learn about themselves, the more they can cope with the intricate social dynamics, engage in productive communication, and establish valuable relationships with others. This will help build the argument that a well-developed identity has a lot to contribute to interpersonal competence and capacity to build social interrelationship.

The absence of the direct connection between the overuse of AI and interpersonal behaviour could be also viewed through the perspectives of increasing dependency on AI as a means of self-reflection, guidance, and feedback among students. As students increasingly rely on AI to form their self-concept and assist them to negotiate social interactions, they might lose interest in spontaneous and authentic social interaction. This observation is aligned to the results of Hargie (2021) study that conveyed that interpersonal competence is acquired via significant social engagements that entail emotional comprehension, empathy, and efficient communication. The pre-programmed answers and feedback functions of the AI systems can help decrease the need of students to acquaint themselves with these valuable interpersonal skills within a real-life interaction. This raises the issue of the potential loss of such useful skills as critical thinking, emotional intelligence, and creativity that are the keys to effective communication between individuals and the development of healthy relationships (Mahajan, 2025).

The study has also revealed a stronger correlation between AI overuse and identity formation. The fact that the association between these two variables is strong shows that AI plays a significant role in the formation of the self-perception of students. The article by Shin (2023) proposed the concept of the algorithmic self, which implies that identity is currently increasingly constructed with the help of the feedback provided by AI, particularly in the environments where personalised information created by AI is regularly shown to students. In the context of university students, AI systems may be utilized to provide coherent feedback and filtered content on a situation-by-situation basis, which may inadvertently reinforce a few of their self-images. This kind of constant reinforcement of already existing perceptions could potentially shape the perception of those students about themselves in a way that could limit the freedom of their own self-discovery (Fitzsimons et al., 2025).

Individualized offers, reactions and feedback on the web actions and preferences of students are continuously provided by artificial intelligence systems, particularly in the education field and social media applications. Yang (2025) clarifies that AI is not merely a reflector of a student but can be actively engaged in the development of their identity. When the student repeatedly receives feedback produced by the algorithms, they start to accept the algorithmic feedback as the true images of themselves, which reduces their self-concept to fit the algorithmically produced images. The result of this self-assessment may decrease the possibility of students doing the introspection and self-reflection that is required to build a delicate and genuine self-assessment.

In addition, the present research identifies that although there is a positive correlation between AI overuse and identity formation, the direct relationship between AI overuse and interpersonal behaviour was found to be insignificant. Although there was an expectation that high use of AI would lead to a decrease in face-to-face interaction, no significant relationship was found between overuse of AI and interpersonal behaviour in this research. To reinforce the argument, Wang et al. (2022) indicate that the influence that AI has on social interactions could be more

complicated and mediated by other variables, including identity formation. Ventura et al. (2025) suggested that excessive dependence on AI may diminish the necessity to communicate with people, which may result in feelings of loneliness and isolation. But the present paper failed to identify any direct evidence in this regard. There is a possibility that the overuse of AI does not have a direct impact on the capacity of students to engage in the social interactions, but instead, it modifies the perception of themselves and their place in the social surrounding. The influence of AI on social behaviour may be less direct thus, and identity is a mediator variable that is likely to affect how students interact and view interactions with others.

The implications based on the results of this study are significant in terms of the psychological welfare; though, the application of AI was not directly connected to interpersonal behaviour. The more students misuse AI, the more they may become dependent on the AI-created self-concepts that can, in turn, deprive students of their real self-understanding. Salah et al. (2024) stated that AI could become an object of emotional dependency in higher education because students are willing to get reassured and validated by AI, not by their human counterparts. In the long term, such dependence on AI can decrease the desire of students to feel uncertain or uncomfortable in social contexts, which is a key element in emotional resilience. Students can begin to find AI a more reliable source of emotional support than their colleagues or mentors (Lee et al., 2025). Because AI systems can offer personalised and immediate feedback, students could become incapable of adjusting to the uncertainties of social interactions in the real life, which will decrease their degree of social connectedness and emotional well-being.

The results of Swart (2021) regarding the impact of AI-controlled algorithms on shaping self-concept further reinforce this concern by highlighting that the algorithms can be used to select and present information that reinforces the existing beliefs and behaviors. Such selective exposure to content has the potential to restrict the number of experiences that help make a well-rounded identity. This self-constriction can be a barrier to students who want to interact with different perspectives and change their social situations. In this respect, AI can reduce the exposure of students to a wider spectrum of social experiences and prevent the emergence of social behaviors that are required to adjust to various group dynamics (Ojo & Afolaranmi, 2024). It is also possible that as AI systems increasingly become part of the daily lives of students they will start to depend on AI to validate themselves, and thus become less adaptive and flexible in their own sense of self-concept that can be fully reliant on their true experiences and their roles in social life.

The results of the study highlight the importance of students striking a balance between their use of AI and engagement in real-life social interactions. As much as AI may prove to be an effective method of learning and development of a person, it should not replace self-discovery and communication with people (Hargie, 2021). The overuse of AI can also radically limit the experiences that the students have in the nature of introspection and social exploration which is required to form an all rounded and genuine picture of themselves. This proves the point made by Bharathi (2023) who assumed that the application of AI to support self-reflection and self-presentation could lead to an identity that is more affected by external reactions than experience. The main solution to mitigating the possible negative effect of AI overuse is to ensure that students engage in face-to-face social interactions that encourage the acquisition of emotional and interpersonal competence.

This study suggests that AI overuse is one of the key contributors to identity formation amongst college students. The identity formation and interpersonal behavior is correlated to the importance of self-concept in facilitating successful social relationship. However, Ojo & Afolaranmi (2024) also stated that AI is not directly related to interpersonal behavior and it means that the social interaction process is mediated by how AI affects identity. The consequences are consistent with the greater problems in the literature about the potential psychological and emotional effects of excessive reliance on AI, namely, the reduction of the ability to freely contemplate oneself and communicate with other individuals. Therefore, the under-researched areas that any future research needs to investigate are the long-term effects of AI on the psychological wellbeing of students with a mention of the need to implement interventions that promote the implementation of AI in a healthy balance between its positive and negative effects on the actual emergence of the process of social and emotional experiences (Zong & Yang, 2025). These can be the promotion of digital literacy, the support of critical thinking regarding all AI-related technologies, and ensuring that students retain the potential of face-to-face interactions and self-discovery, which are key factors of emotional resilience and healthy, authentic identity development.

The use of AI in the daily life of students opens new opportunities and challenges to the development. Even though it is true that AI can help students in their academic and personal life, one should keep in mind that there are also threats in overuse of AI, particularly in identity formation and human behavior. The findings of this paper highlight the importance of balancing AI use and promoting the real self-discovery, emotional resilience, and personal effectiveness during the years of studying at the university. The research into these relations as well as interventions that would allow students to navigate the complexity of the digital age and maintain psychological stability and social development needs to be continued in the future. The study hypotheses were partly supported. It was established that AI overuse has a strong connotation with identity formation, although there was no direct correlation between AI overuse and interpersonal behaviour. Also, the role of identity formation was found to mediate between interpersonal behaviour and AI overuse. Thus, although overusing AI contributes to the development of self-perception among students, it does not influence their social relationships directly. Rather, identity formation is a factor that determines the social behaviour of students.

Recommendations

- Universities should integrate structured digital reflection activities into student support programmes so that AI use is balanced with self-exploration, critical thinking, and direct interpersonal engagement.
- Higher education institutions should provide targeted guidance on responsible AI use, emphasizing boundaries, reflective awareness, and the continued value of face to face social interaction.

These recommendations follow directly from the study findings and from the wider literature reviewed in the dissertation. According to Joseph (2025), AI may influence introspection and agency, which indicates that students should be assisted with the critical reflection on how AI impacts self-perception. As demonstrated by Crawford et al. (2024), the shift towards an AI-driven approach to support in higher education can be socially and emotionally expensive to students. It is on this basis that universities must encourage moderated and not unfettered use of AI as well as enhance the prospects of genuine interaction between peers with peers and authentic identity formation. In practical terms, institutional guidance should move beyond technical

training and include developmental support that protects both student wellbeing and interpersonal growth.

Implication of Findings

The findings have important theoretical and practical implications for psychology and higher education. First, the positive relationship between identity formation and interpersonal behaviour supports developmental perspectives which argue that a clearer and more coherent sense of self helps individuals engage more effectively in social life. Maurer and Daukantaitė (2020) emphasized that healthy personal growth depends on authentic self-awareness and congruence between experience and self-concept. Youvan (2024) similarly argued that identity development requires active exploration rather than passive acceptance of readymade definitions. In this context, the present findings suggest that students with stronger identity formation may be better positioned to communicate, relate, and function within interpersonal settings. This indicates that identity development remains a meaningful psychological foundation for social competence in university life.

Second, the positive relationship between identity formation and AI overuse suggests that AI may now play a role in shaping how students understand themselves. Joseph (2025) argued that the algorithmic self emerges when AI systems begin to influence introspection, agency, and self-perception through repeated feedback. Swart (2021) also showed that young people experience algorithmic systems as filters that shape meaning and everyday understanding. The present findings are consistent with these concerns because they indicate that heavier engagement with AI is associated with identity related processes. This means that universities may need to treat AI not only as a learning tool but also as a developmental influence that can affect how students construct selfhood. The key implication is that student support frameworks should address reflective and social development alongside digital competence.

Research Limitations

Several limitations should be acknowledged when interpreting the findings. First, the study used a cross sectional design, which means that the direction of relationships cannot be established with certainty. Although identity formation was associated with both interpersonal behaviour and AI overuse, the design does not allow causal conclusions about whether one variable influence another over time. Capili (2021) noted that cross sectional studies are useful for identifying patterns within a population, but they are limited in their ability to track developmental change. Slater and Hasson (2025) also emphasized the importance of careful interpretation when quantitative findings are based on a single time point. As a result, the findings should be understood as relational rather than causal, and this limits the strength of broader developmental claims.

A second limitation concerns the use of self-report measures administered through an online questionnaire. While this method allowed efficient data collection from a relatively large sample, self-report data remain vulnerable to response bias, social desirability, and subjective interpretation. Singh and Sagar (2021) observed that online questionnaire studies offer convenience and accessibility, yet they may also reduce researcher control over how participants understand and complete items. Rousset et al. (2025) further argued that survey-based research must consider representativeness and data quality when drawing wider conclusions. In addition, the sample was drawn from one university context and was concentrated mainly in the younger age group. This means that the findings may not fully represent students from other institutions,

age groups, or educational settings. These limitations suggest the need for caution when generalizing the results beyond the current sample.

Conclusion

This paper has investigated the connection between AI overuse, identity formation and interpersonal behaviour amongst students in universities. The findings indicated that the identity formation was positively correlated with interpersonal behaviour as well as AI overuse, but no statistically significant relationship was established between AI overuse and interpersonal behaviour. The results imply that identity formation takes the central role in the cognition of how students interact with AI and operate socially. The trend suggests that the application of AI can have a more direct relationship with the students as they begin to develop a sense of self than with their interpersonal behaviour. Practically, the results suggest that the psychological impact of AI can be an effect of internal processes of self-perception and self-building, but not an effect of direct alteration of social interaction. The research thus adds to the emerging body of literature on AI in higher education by redirecting the focus on academic performance to the wider developmental issues. Overall, the findings support the argument that balanced engagement with AI is important during the university years, when identity development and interpersonal growth remain significant aspects of student wellbeing.

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