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High stakes account for low grades? Examining the interplay of gambling severity, attitudes, behaviours, and intervention approaches among university students

James Tuffour[1], Sabina Appiah-Boateng[2], Emmanuel Yaw Arhin[3], Albert Acheampong[3*], Noah Boakye-Yiadom[4]

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[1]School of Business, Burman University, Alberta, Canada
[2]Department of Peace Studies, School for Development Studies, University of Cape Coast, Ghana
[3]Department of Accounting, School of Business, University of Cape Coast, Ghana
[4]Cumming School of Medicine, O'Brien Institute for Public Health, University of Calgary
*Corresponding author: Albert Acheampong: aacheampong005@stu.ucc.edu.gh

Abstract. This study investigates the relationship between gambling and academic performance among university students, focusing on the roles of gambling severity, attitudes, behaviours, and intervention strategies. Grounded in the General Strain Theory and the Theory of Planned Behaviour, the study employs a quantitative research design using an online survey of 644 students from a public university in Ghana. Data were analysed using SmartPLS structural equation modelling. The findings reveal that gambling attitudes and gambling severity significantly predict poor academic performance, while gambling behaviours and reduction measures show little statistically significant effect. These results suggest that problem gambling, shaped by students' psychological perceptions and emotional strain, poses a serious academic risk. The study recommends institutional interventions such as targeted awareness campaigns, mental health support, and stricter access controls to gambling platforms. It contributes to the literature of problem gambling by integrating behavioural and emotional frameworks to explain how gambling influences educational outcomes, and it calls for evidence-based policies to address student gambling in higher education settings.

Keywords: Academic performance, Gambling Severity, Gambling addiction, Gambling behaviours, Student life.

Introduction

Gambling has emerged as a pervasive socio-economic phenomenon among youths in developing countries. This study adapts the definition of gambling as staking something of value, typically money, on an uncertain outcome to obtain a greater return (Adu-Akoh, 2023; Stetzka & Winter, 2023). The rising popularity of gambling raises serious concerns, particularly regarding students' well-being and declining academic performance (Edjah *et al.,* 2022). In the past, gambling, especially sports betting, was rarely discussed in Ghana and other African societies due to its perceived immorality (Toklo, 2024). Arguably, this perception has shifted as the gambling landscape continues to evolve. In Ghana, the gambling industry has grown rapidly, driven by easier access to gambling platforms, aggressive marketing strategies, and the expansion of digital services (Yendork *et al*., 2023). This growth has become a pressing educational and public health concern among university students, prompting critical inquiry into its psychological and academic implications.

Available statistics on youth gambling in Africa depict a worrying trend, likely driven by institutional weaknesses (Acheampong *et al.,* 2022). Nearly 80% of university students in Kenya participate in sports betting, while approximately 70% of Zambian and 60% of Nigerian youths are engaged in similar activities (Sakala *et al.,* 2019). In Ghana, around 70% of youth are involved in gambling, placing it fourth in Africa for youth gambling participation (Statista, 2021; Acheampong *et al.,* 2022). The Ghana Statistical Service (2021) reports that two-thirds of the country's youths, mostly from senior high and higher education institutions, actively participate in online sports betting. These numbers highlight the growing normalization of gambling among African youths, emphasising the need to explore its drivers and academic consequences. One major driver is the accessibility of gambling platforms. The widespread availability of the internet and mobile devices allows students to gamble online discreetly, avoiding the stigma associated with physical gambling venues (Lawn *et al*., 2020).

Moreover, marketing and media influence play critical roles. Noble *et al.* (2022) assert that aggressive advertising and promotional content across various platforms have helped normalize gambling and created illusions of quick wealth. Adu-Akoh (2023) further explains that these campaigns often use celebrity endorsements and peer influencers to appeal to young audiences, particularly through social media. In addition to accessibility and marketing, student gambling is driven by a combination of economic and psychological motivations. Stetzka and Winter (2023) note that these factors often overlap and reinforce each other. Raymen and Smith (2020) divide these motivations into two broad categories: financial gain and experiential enjoyment. Economically, students may view gambling as a rational attempt to earn money, despite the risks it may pose to their academic success. Psychologically, gambling may serve as entertainment

and a form of social interaction, fuelled by excitement and thrill rather than financial motives (Stetzka & Winter, 2023). These motivations are amplified by the social and financial pressures many students face, including tuition costs, living expenses, and maintaining social status (Max *et al.,* 2020).

The effects of problem gambling on academic life are significant. Numerous studies have established a strong negative correlation between gambling and good academic performance (Odame *et al.,* 2021; Zhou *et al.,* 2024). For instance, Amoah-Nuamah *et al.* (2023) and Odame *et al.* (2021) show that excessive gambling is linked to decreased study time, poor concentration, and increased financial stress. As students become more consumed by gambling, their ability to manage academic obligations declines, resulting in lower class attendance, poor study habits, and ultimately, reduced academic achievement (Adu-Akoh, 2023).

Despite the growing interest in this area, gaps remain in understanding how gambling affects academic performance. Many existing studies have examined gambling attitudes and behaviours in isolation, failing to consider their combined impact on educational outcomes (see e.g., Delfabbro & King, 2021; Glozah *et al*., 2021; St Quinton, 2022). Additionally, few studies have examined the role of gambling reduction strategies in improving students' academic performance (see e.g., Amoah-Nuamah *et al*., 2023; Avenyo *et al*., 2024; Edjah *et al*., 2022). Our study addresses these gaps by applying the *General Strain Theory* and the *Theory of Planned Behaviour* to examine the relationship between gambling severity, attitudes, behaviours, and academic performance. It also evaluates how gambling reduction strategies may mitigate negative outcomes and promote academic success.

The three main constructs in our study are operationalized as follows. *Gambling severity* refers to the extent to which an individual's gambling involvement creates functional, financial, psychological, and academic harm, typically classified into low-risk, moderate-risk, and problem gambling levels using standardized screening measures such as the *Canadian Problem Gambling Severity Index* (CPGI) (Ferris & Wynne, 2001). *Gambling attitudes* describe students' cognitive and affective evaluations of gambling, including beliefs about its benefits, risks, acceptability, and desirability (St Quinton, 2022). *Gambling behaviours* capture the observable patterns and frequency of gambling participation, such as betting regularity, time spent on gambling, and tendencies toward compulsive or chase betting (Adu-Akoh & Kwarteng-Nantwi, 2023). Clarifying these constructs distinguishes between perception, action, and problem intensity, which are analytically treated as separate but related predictors of academic outcomes in this study.

The significance of this research extends beyond academia. By analysing gambling patterns, motivations, and consequences among Ghanaian university students, the study aims to inform targeted prevention strategies through institutional policies. It also offers insights for mental

health professionals developing interventions to support students affected by gambling. Furthermore, this study contributes to the international discussion on youth gambling and provides practical recommendations for tackling problem gambling in higher education.

To achieve these goals, the study explores how students' gambling attitudes and behaviours relate to academic performance. It also assesses the impact of gambling severity and examines the effectiveness of intervention measures. The remainder of the paper is organised as follows. Next is a review of the literature and theoretical frameworks underpinning the study. This is followed by the methodology employed to achieve the research objectives. Also, the results and discussion are presented. Finally, a conclusion is drawn with policy recommendations to address problem gambling among university students in a developing country context.

Literature review and hypotheses development

General strain theory

The General Strain Theory (GST) is a well-known framework that offers insights into factors that contribute to deviant behaviours such as crime and addiction (Agnew, 1992). Rooted in earlier classical strain theories, GST builds on the premise that individuals may resort to deviant behaviours when they are unable to achieve valued goals through legitimate means (Merton, 1938; Cloward & Ohlin, 1960). Agnew and Brezina (2019) expanded this perspective by introducing GST, emphasizing the role of negative emotions in response to strain. According to GST, strain arises from three key circumstances: inability to achieve valued goals (e.g., academic success or career aspirations), the loss of valued stimuli (e.g., parental separation or romantic breakups), and exposure to negative stimuli (e.g., abuse or bullying). These experiences can generate negative emotions such as anger, anxiety, and depression, which may prompt deviant or escapist responses like gambling (Agnew & Brezina, 2019).

The GST is particularly relevant in the context of university students as they frequently face multiple strains, including academic pressures, financial burdens, and social expectations (Travis *et al.,* 2020). The pressure to meet academic requirements, pay tuition fees, and maintain a certain lifestyle can be overwhelming, hence, gambling may become an appealing escape from reality (Chang & Kim, 2020). Debatably, students under strain may perceive legitimate means like part-time work or achieving good grades as too slow or ineffective in meeting their immediate needs. Therefore, the emotional burden of strain, combined with the lure of quick financial gains, can make gambling seem like a viable option. Kabiri *et al.* (2020) support this view, noting that students experiencing multiple forms of academic, financial, and social strains are more likely to engage in gambling, especially when faced with financial hardships.

Moreover, research shows that the link between strain and gambling is mediated by emotional distress. For example, negative emotions such as frustration, anxiety, and depression can impair judgment, leading students

to seek instant relief through gambling, despite its long-term psychological risks (Punia *et al.,* 2024). Delfabbro and King (2021) also found that academic and financial stress significantly influence gambling onset and severity among students. GST's relevance to academic performance is clear in its explanation of how gambling behaviours triggered by strain can lead to a self-repeating cycle. As students engage in gambling as a response to strains, their academic performance often suffers due to reduced study time, decreased concentration, and financial stress (Malik *et al*., 2024). Noticeably, poor academic performance creates additional strains, potentially leading to intensified gambling behaviour as a misguided attempt to alleviate the mounting pressures (Delfabbro & King, 2021). Punia *et al.'s* (2024) research demonstrates this cyclical relationship, showing how strain-induced gambling behaviours significantly predict declining academic performance as a result of gambling severity. GST, therefore, becomes the right framework to help us explain why students persist in gambling despite its negative impact on academic performance.

Despite its usefulness, GST is exposed to some weaknesses. Critics of the theory point out its oversimplification of the link between strain and deviance by failing to explain why not all strained individuals turn to gambling (Kabiri *et al.,* 2020). Others note that GST overlooks moderating factors such as resilience and self-control (Kabiri *et al.,* 2020; Skoczylis & Andrews, 2023). Cultural and socio-economic variations in gambling behaviour are also underexplored in the theory, which has been critiqued for its Western-centric perspectives (Noh & Isom, 2023; Wang *et al.,* 2022). To address these limitations, this study complements GST with the *Theory of Planned Behaviour* to better understand how students' attitudes, perceived behavioural control, and intentions shape their gambling behaviours.

Theory of planned behaviour

The Theory of Planned Behaviour (TPB), developed by Ajzen (1991, 2002), is a well-established social cognition model used to explain a range of youth health behaviours, including smoking, the use of contraceptives and drugs, and alcohol consumption (Wash *et al*., 2022; Tran *et al*., 2021). It has also been applied to understand gambling behaviours and the decision-making processes underlying specific gambling activities (Wang *et al.,* 2021).

Ajzen (1991) suggests that behavioural intentions are shaped by three main factors: attitudes, subjective norms, and perceptions of control. Attitudes refer to an individual’s overall evaluation of a behaviour as positive or negative. In the context of students and gambling behaviours, these attitudes often appear as students viewing gambling as an exciting form of entertainment or a quick way to make money (Wang et al. 2021). Subjective norms relate to how individuals perceive others' opinions or judgments of their behaviours. Among university students, these norms are especially influential as peer groups, family members, and social media

influencers shape their gambling choices (Glozah et al., 2021). Perceived behavioural control involves an individual's expectations about how easy or difficult it is to perform a specific behaviour. In gambling, this may be affected by students' confidence in their ability to place bets, understand odds, or access betting platforms (Stratton *et al.,* 2024).

La Barbera and Ajzen (2020) argue that when these three factors are favourable, the intention to perform a behaviour strengthens. TPB also posits that behavioural intention is positively correlated with actual behaviour (La Barbera & Ajzen, 2020). Several studies have supported TPB's applicability to gambling behaviours. For instance, Flack and Morris (2017) report that gambling frequency in Australia was positively associated with normative beliefs. Similarly, Hing *et al.* (2015) confirm that subjective norms strongly influence sports betting intentions. Martin *et al.* (2010) found that attitudes, subjective norms, and perceived control explain nearly one-third of gambling frequency among college students. Wang *et al*. (2021) examined factors influencing college students' behavioural intentions and behaviours related to sports gambling through the lens of the TPB. Their findings revealed that attitude was the strongest predictor of students' intentions to engage in sports gambling, followed by subjective norms. Additionally, both behavioural intention and perceived behavioural control were significant predictors of actual sports gambling behaviour. Furthermore, Wu and Tang's (2012) study of gambling behaviour among Chinese students concluded that gambling addiction was influenced by subjective norms that surround gambling and a low sense of control over resisting the act of gambling.

TPB has limitations, despite its strengths. One major criticism is its limited consideration of emotional factors, such as guilt, regret, or anticipated negative emotions, which significantly influence high-risk behaviours like gambling (Malik *et al.,* 2024). People often avoid behaviours they believe will result in emotional distress (Williams & Evans, 2014). Additionally, TPB has been critiqued for its limited attention to how intentions and behaviours evolve (Wang *et al.,* 2024) and its failure to adequately account for the role of past behaviours and habits in shaping current gambling patterns (Stratton *et al.,* 2024).

Integration of GST and TPB as complementary frameworks

A combined analysis of GST and TPB provides a stronger conceptual foundation for this study's model and hypotheses. GST identifies key background triggers such as financial hardship, academic stress, and emotional strain (Travis *et al.,* 2020) that increase vulnerability to maladaptive coping responses, including gambling participation and escalation into problem gambling severity. TPB complements this by explaining the mediating cognitive mechanisms through which these strains are converted into behavioural outcomes, specifically through gambling attitudes, perceived social approval, and perceived behavioural control (La Barbera & Ajzen, 2020). Conceptually, gambling severity in this study

reflects strain-linked behavioural escalation (GST), while gambling attitudes and behaviours reflect TPB's attitudinal and behavioural intention pathways. This theoretical mapping strengthens the rationale for modelling severity, attitudes, behaviours, and interventions together in predicting academic performance outcomes.

Gambling motivations

Gambling, including betting, involves staking money or valuables on events with uncertain outcomes, typically for potential monetary gain (Adu-Akoh, 2023; Stetzka & Winter, 2023). Among Ghanaian university students, sports betting, particularly predicting sports outcomes for financial rewards, is popular (Avenyo *et al.,* 2024; Adu-Akoh & Kwarteng-Nantwi, 2023). This rise in popularity is driven by increasing internet access and the widespread legalization of gambling with activities spanning sports like soccer, basketball, and horse racing (Avenyo *et al.,* 2024). Bettors may predict winning teams, total scores, or specific in-game events, and although decisions are sometimes based on analysis of factors like team performance or player injuries, outcomes remain uncertain (Labrador & Vallejo-Achón, 2020). Noticeably, the growing acceptance of sports betting has led to increased participation across various demographics, including adolescents (Hing *et al.,* 2023). In sub-Saharan Africa, over 80% of countries have legalized betting through different regulatory approaches (Avenyo *et al.,* 2024).

The answers to the question of why students gamble, despite the underlying negative impact, are twofold: the pursuit of wealth and the desire for pleasure (Raymen & Smith, 2020). The first portrays gamblers as rational actors seeking financial gain amid uncertainty (Max *et al.,* 2020), while the second emphasizes gambling as a source of amusement (Stetzka & Winter, 2023). For many, gambling functions as a recreational activity rather than a purely economic venture (Keovisai & Kim, 2019). While gambling may offer momentary benefits or financial hope, it can negatively affect students' academic performance (Avenyo *et al.,* 2024).

Students' gambling attitudes and academic performance

Gambling attitudes among university students reflect their beliefs, emotions, and behavioural inclinations toward gambling (St Quinton, 2022). St Quinton claims that these attitudes comprise three components: cognitive (beliefs), affective (feelings), and behavioural (intentions to gamble). Understanding these dimensions helps explain how students perceive and engage in gambling within the academic environment.

In Ghana, gambling attitudes have been shaped by the rise of betting companies and online gambling platforms (Toklo, 2024). The increasing availability of gambling options, such as lotteries and sports betting via mobile apps, has made gambling easily accessible. Internet penetration continues to drive gambling among economically active youths (Amoah-Nuamah *et al.,* 2023). Studies in the Ghanaian context show troubling links

between students' gambling attitudes and academic performance. Amoah-Nuamah *et al.* (2023) found high participation rates in online gambling among students, with problem gambling affecting academic work negatively. Similarly, Adu-Akoh and Kwarteng-Nantwi (2023) report that excessive gambling reduces study time, causing poor academic outcomes and increased stress. These studies suggest that gambling attitudes may negatively affect students' educational achievements. Based on these discussions, we hypothesize that:

H_1: There is a significant positive relationship between students' gambling attitudes and poor academic performance.

Gambling behaviour and academic performance

Gambling behaviour among university students is marked by patterns such as compulsive betting, frequent wagering, chase betting (attempting to recover losses), and excessive time spent on gambling activities (Adu-Akoh & Kwarteng-Nantwi, 2023). These behaviours are observed in various forms, including sports betting, casino games, and other online platforms, often leading to negative educational outcomes. A survey by Statista (2021) found that 70% of Ghanaian youths engage in gambling, ranking Ghana fourth in Africa for youth gambling. This survey suggests that 80% of young bettors spend significant amounts of their school time on online sports betting, leading to poor academic performance. The Ghana Statistical Service (2021) adds that a significant number of Ghanaian youths are actively engaged in online sports betting, a popular phenomenon in high schools and universities (Acheampong *et al.,* 2022). Although the exact figures on problem gambling among university students are scarce, it is worth pointing out that researchers project a widespread addiction problem in this demographic (Acheampong *et al.,* 2022; Amoah-Nuamah, 2023).

Noble *et al.* (2022) demonstrate that aggressive marketing strategies and pervasive advertisements across various media platforms directly influence students' gambling behaviour. These advertisements normalize gambling activities, creating a perception of easy access to wealth and triggering gambling urges. Most often, such advertisements feature celebrities and peer influencers, particularly targeting young people through social media and online platforms, leading to increased gambling participation among students (Adu-Akoh, 2023; Glozah *et al.,* 2021). Problem gambling behaviours include spending excessive time on gambling instead of studying, misusing tuition fees and educational funds, and developing addictions that affect class attendance and study routines (Adu-Akoh & Kwarteng-Nantwi, 2023). These patterns hinder academic success (Amoah-Nuamah *et al.,* 2023). Avenyo *et al.*'s (2024) study of online sports betting concludes that gambling addiction severely impacts students' academic and personal development. Again, Odame *et al.* (2021) emphasize its broader socio-economic consequences. Based on these findings, we hypothesise that:

H_2: There is a significant positive relationship between students' gambling behaviour and poor academic performance.

Gambling severity and academic performance

Gambling severity, also known as problem gambling, refers to the extent to which gambling behaviour affects various areas of one's life, including poor academic performance (Edjah *et al.,* 2022). According to the CPGI, problem gambling causes harm not only to the individual but also to their immediate society (Ferris & Wynne, 2001). The CPGI assesses gambling severity on four metrics: non-problem gambler, low-risk gambler, moderate-risk gambler, and problem gambler, with the latter reflecting the highest severity.

Studies have shown a strong link between gambling severity and declining academic performance. For instance, Adu-Akoh (2023) and Edjah *et al.* (2022) found significant associations between gambling severity levels and students' study habits. Similarly, Ogachi *et al.* (2020) observed that Kenyan students with high gambling severity experienced poor academic and social outcomes. These findings emphasize the need for effective interventions to minimize gambling-related harm among students. Based on the empirical evidence provided, we hypothesize that:

H_3: There is a positive relationship between gambling severity and poor academic performance.

Gambling reduction measures and academic performance

Gambling reduction measures are vital intervention strategies aimed at supporting university students in managing gambling behaviour and enhancing academic performance. These interventions typically include educational programs, counselling services, and institutional policies (Dodig-Hundric *et al.,* 2021). Effective gambling reduction strategies operate at three levels: prevention, intervention, and rehabilitation (Riley *et al.,* 2021).

Gambling prevention measures focus on awareness creation and early education about gambling risks (Edgren *et al.,* 2022). Universities in Ghana can implement preventive strategies through orientation programs, regular workshops, and the integration of gambling awareness into student welfare programs. Adu-Akoh (2023) argues that these preventive approaches have shown some promise in swaying students from initiating problem gambling behaviours. Intervention measures such as counselling and peer-support groups focus on students who are already experiencing gambling issues (Penfold & Ogden, 2022). Institutions that adopt these programs report improvements in class attendance and other academic engagements (Riley *et al.,* 2021). Professional counselling in gambling addiction, significantly helps students refocus on their academic work (Edgren *et al.,* 2022).

Arguably, the Government of Ghana has taken some steps to curb problem gambling. Betting is regulated by the Gaming Commission under

the Gaming Act 2006 (Act 721), which oversees licensing and promotes responsible gambling. The Commission also provides support for individuals facing gambling-related problems (Odame *et al.,* 2021). Until recently, a 10% tax that was slapped on betting gains was intended to control problem gambling (Toklo, 2024). Again, some universities have restricted access to betting sites via campus Wi-Fi (Adu-Akoh, 2023), and university counselling units offer targeted support. Despite these efforts, questions remain regarding the effectiveness of these interventions in altering gambling behaviour. Based on this discussion, we hypothesize that:

H_4: Gambling reduction measures positively improve students' academic performance.

Conceptual framework

The conceptual framework (Figure 1) illustrates the hypothesized relationships between gambling-related factors and academic performance among university students. Gambling attitudes (H1), gambling behaviour (H2), and gambling severity (H3) are modelled as direct predictors of academic performance, reflecting cognitive, behavioural, and strain-based influences. Gambling reduction measures (H4) are incorporated as an institutional intervention mechanism expected to mitigate negative academic outcomes.

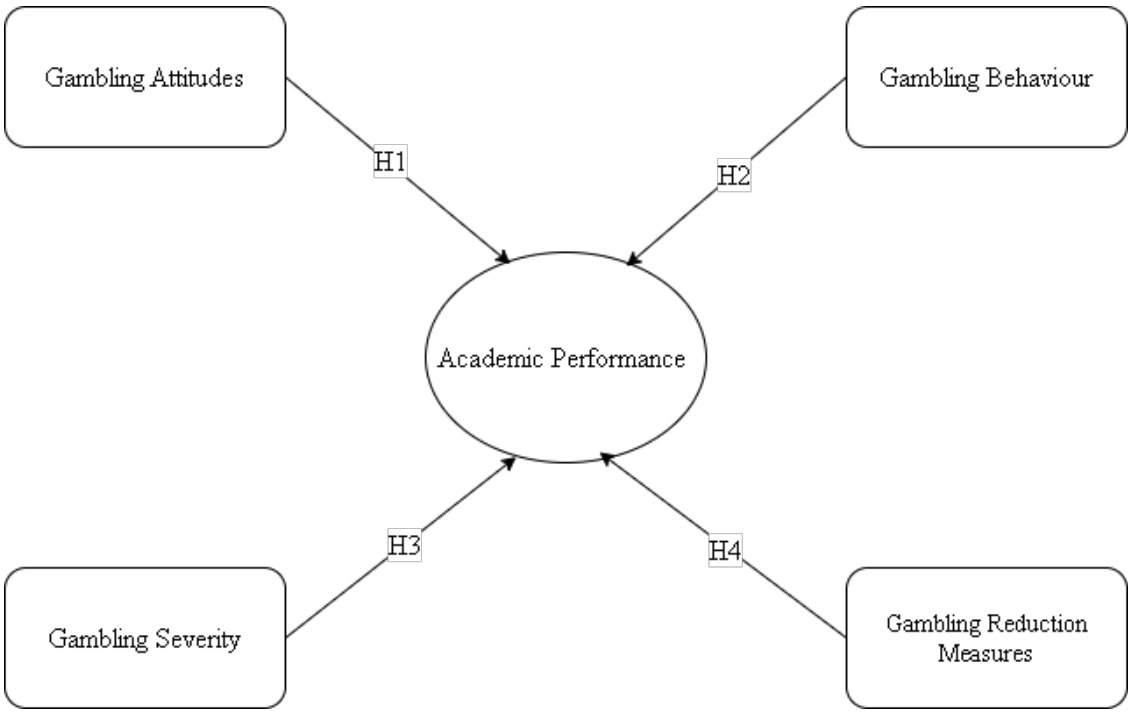

Figure 1: Conceptual Framework
Source: Authors' construct (2025)

Methods

Research design

A quantitative research method that utilises an online survey design was employed in this study to collect and analyze numerical data. This approach allowed for the systematic gathering of high-quality data from a large population in a cost-effective and time-efficient manner. An online survey was used to collect the data. This provided several advantages, including increased accessibility to a diverse pool of respondents, reduced geographical limitations, and the ability to reach participants across different time zones.

Importantly, the choice of an online survey design was strategically aligned with the study's objectives and context. University students demonstrate relatively high levels of digital literacy, making online platforms an effective medium for data collection. Additionally, gambling is a sensitive behavioural topic, and the anonymity afforded by an online survey reduces social desirability bias and encourages more honest self-reporting compared to face-to-face methods. This design, therefore, enhanced both response quality and ethical sensitivity in capturing gambling-related behaviours and perceptions.

The study's online survey design incorporated structured questions with predetermined response options, enabling the researchers to gather standardized data that could be easily quantified and analyzed. This method facilitated the examination of relationships between variables, the testing of hypotheses, and the identification of patterns or trends within the dataset. Additionally, the online format allowed for the implementation of skip logic and branching questions, tailoring the survey experience to individual respondents and potentially improving the quality and relevance of the data obtained.

Research instrument and data collection

A closed-ended online self-administered questionnaire was used as the research instrument. These questions were adapted from the *Canadian Problem Gambling Severity Index* (Ferris & Wynne, 2001) and existing literature (Mateo-Flor *et al.,* 2020; Acheampong *et al.,* 2022; Edjah *et al.,* 2022). The effectiveness of the questionnaire as a survey tool relies on the assumption that all respondents are university students, hence, they could read and understand the research instrument. The significant constructs used in the study include Gambling Severity (Gam Severity), Gambling Behaviour (Gam Behaviour), Gambling Attitude (Gam Attitude), Gambling Reduction Measures (Gam Reduction Measures), and Performance. Additionally, gender, age, education level, and college were employed as the demographic variables.

Each construct was operationalized using multiple reflective indicators measured on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Gambling severity items captured the extent of problem gambling symptoms, such as loss of control and negative

academic consequences. Gambling attitude items measured students' beliefs and evaluations regarding gambling acceptability and perceived benefits. Gambling behaviour items assessed frequency and engagement in betting-related activities. Gambling reduction measures captured the perceived effectiveness of institutional and personal control mechanisms. Minor wording adaptations were made to ensure cultural relevance and contextual clarity within the Ghanaian university setting. Prior to full deployment, the questionnaire was pilot tested to 45 students to ensure clarity and content validity. This process helped in refining item wording and ensured that the instrument appropriately measured the respondents' betting and academic activities.

The survey was administered to 1,977 students at a public university in Ghana between June and August 2024. Out of this number, 644 questionnaires were valid for this study (see Table 1). A simple random sampling approach was employed, facilitated through student online platforms. This sampling technique enabled broad participation and ensured that each student had an equal chance of being selected to complete the questionnaire. More importantly, this sampling technique minimized selection bias, ensuring that the data was a fair representation of the population. Noticeably, male respondents constituted a higher proportion (81.5%) of the sample.

The inclusion criteria required that respondents be currently enrolled in a program of study at the case university and be at least 18 years old. Importantly, the respondents should have had some exposure to or awareness of gambling activities. Targeting a larger population for the data collection was to ensure that students who participated in the study were not stigmatised as being active participants in gambling. Additionally, our open-sourcing approach was to secure the validity of the answers received. The final sample size of 644 exceeded the minimum requirements for a quantitative and Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis. This sample size was adequate given the number of predictors in the structural model, ensuring sufficient statistical power and stable parameter estimation.

Table 1: Respondents' demographic characteristics

Variable	N	%
Gender		
Male	525	81.5
Female	119	18.5
Age		
18 – 20	136	21.1
21 – 30	497	77.2
31 – 40	8	1.2
41 – 50	3	0.5
Above 50	0	0
Level of Education		
Level 100	109	16.9
Level 200	230	35.7
Level 300	165	25.6
Level 400	125	19.4
Level 500	2	0.3
Level 600	1	0.2
Graduate	12	1.9

Source: Authors' construct (2024)

Notes: The demographic characteristics of the respondents are represented in this table. Total sample (N) = 644, *n* denotes the frequency, and % represents the percentage.

Data analysis

The data for the study were analysed using Smart-PLS version 4.0.8.3. A total of 644 responses were used for the estimations. Regression findings were produced using bootstrap samples totalling 5,000, and the hypotheses were evaluated at a 5% significance level (Figure 2). PLS-SEM was selected over covariance-based SEM (CB-SEM) due to the study's prediction-oriented objective, the exploratory nature of the model, and the ability of PLS-SEM to handle complex models with non-normal data distributions. This approach is also appropriate when the primary goal is explaining variance in key endogenous constructs rather than model fit alone.

Indicator validity and reliability were evaluated using composite reliability (CR) and Cronbach's Alpha (CA) statistics (Table 2). To ensure that unrelated constructs remained distinct, discriminant validity was tested using the average variance explained (AVE) of the observed variables. Also, the study assessed discriminant validity using both the Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio analysis (see Tables 4 and 3). Following Hair *et al.* (2019), CA and CR values above 0.70

were considered acceptable, AVE values exceeded the 0.50 threshold, HTMT ratios remained below the conservative 0.85 criterion, and variance inflation factor (VIF) values were below 5, indicating no multicollinearity concerns.

As indicated in Tables 8 and 9, the model's fit was assessed through the standardized root mean square residual (SRMR). Additionally, the model's coefficient of determination (R^2) and effect size (F^2) were analysed. The SRMR value of 0.054 falls below the recommended threshold of 0.08, indicating satisfactory model fit. R^2 values were interpreted to assess explanatory power, while F^2 values were used to evaluate the substantive impact of each exogenous construct on academic performance.

Table 2: AVE, construct reliability, validity statistics

	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Gam Attitude	0.613	0.834	0.716
Gam Behaviour	0.723	0.878	0.782
Gam Severity	0.823	0.876	0.586
Gam Red Meas	0.905	0.922	0.628
Performance	0.937	0.947	0.618

Source: Authors' construct (2024)

Table 3: HTMT ratio

	Gam Attitude	Gam Behaviour	Gam Red Meas	Gam Severity	Performance
Gam Attitude					
Gam Behaviour	**0.189**				
Gam Red Meas	0.308	**0.053**			
Gam Severity	0.477	0.746	**0.094**		
Performance	0.511	0.438	0.130	0.658	

Source: Authors' construct (2024)

Table 4: Fornell-Lacker criterion

	Gam Attitude	Gam Behaviour	Gam Red Meas	Gam Severity	Performance
Gam Attitude	**0.846**				
Gam Behaviour	0.132	**0.884**			
Gam Red Meas	0.243	0.006	**0.793**		
Gam Severity	0.343	0.570	0.086	**0.765**	
Performance	0.397	0.367	0.136	0.584	**0.786**

Source: Authors' construct (2024)

Ethical consideration

This study has received full ethical approval from the Research Ethics Board of Anglia Ruskin University (*Research Ethics Application Number: ETH2425-0085*), ensuring compliance with ethical standards and guidelines for research involving humans. Participation was voluntary, informed consent was obtained electronically before survey commencement, and respondents were informed of their right to withdraw at any stage without penalty. No personally identifiable information was collected, and all data were securely stored on password-protected systems accessible only to the research team.

Results

Measurement model

Factor loadings (see Table 5) show the level at which indicators from a given correlation matrix relate to an intended principal component. The loadings range from -1.0 to 1.0. In absolute terms, higher values imply higher correlations with an intended factor.

Table 5: Factor loadings and variance inflation factor

	VIF	Gam Attitude	Gam Behaviour	Gam Meas	Red	Gam Severity	Performance
Gam Attitude 1	1.242	0.791					
Gam Attitude 2	1.242	0.898					
Gam Behaviour 1	1.473		0.861				
Gam Behaviour 2	1.473		0.907				
Gam Red Meas 1	2.113			0.755			
Gam Red Meas 2	2.254			0.818			
Gam Red Meas 3	2.321			0.811			
Gam Red Meas 4	2.210			0.812			
Gam Red Meas 5	2.494			0.768			
Gam Red Meas 6	2.352			0.805			
Gam Red Meas 7	2.006			0.778			
Gam Severity 1	1.433					0.696	
Gam Severity 2	1.739					0.790	
Gam Severity 3	1.543					0.733	
Gam Severity 4	1.883					0.830	
Gam Severity 5	1.641					0.771	
Performance 1	1.929						0.710
Performance 2	1.915						0.717
Performance 3	1.832						0.714
Performance 4	3.019						0.811
Performance 5	3.406						0.846
Performance 6	2.897						0.803
Performance 7	3.465						0.853
Performance 8	2.294						0.774
Performance 9	3.034						0.852
Performance 10	2.011						0.734
Performance 11	2.531						0.811

Source: Authors' construct (2024)

The reliability of indicators in factor analysis is crucial for ensuring the validity of research findings. Hair et al. (2014) propose that indicators with loadings exceeding 0.60 can be considered reliable. In this study, indicator loadings ranged from 0.696 to 0.907, demonstrating robust reliability (see Table 5). All constructs also satisfied internal consistency and convergent validity requirements, as reflected in acceptable CA, CR, and AVE values (Table 2). Discriminant validity was confirmed using

Fornell–Larcker and HTMT criteria (Tables 3 and 4), indicating that constructs were empirically distinct.

The statistical significance of these loadings at the 5% level ($p<0.05$) further strengthens the confidence in the model's reliability. This indicates that the observed relationships between the indicators and their constructs are unlikely to have occurred by chance, providing a solid foundation for further analysis and interpretation. Additionally, the graphical representation of Figure 2 offers a visual aid to understand the distribution and magnitude of these factor loadings, potentially highlighting patterns or clusters of indicators with particularly strong or comparatively weaker associations to their constructs.

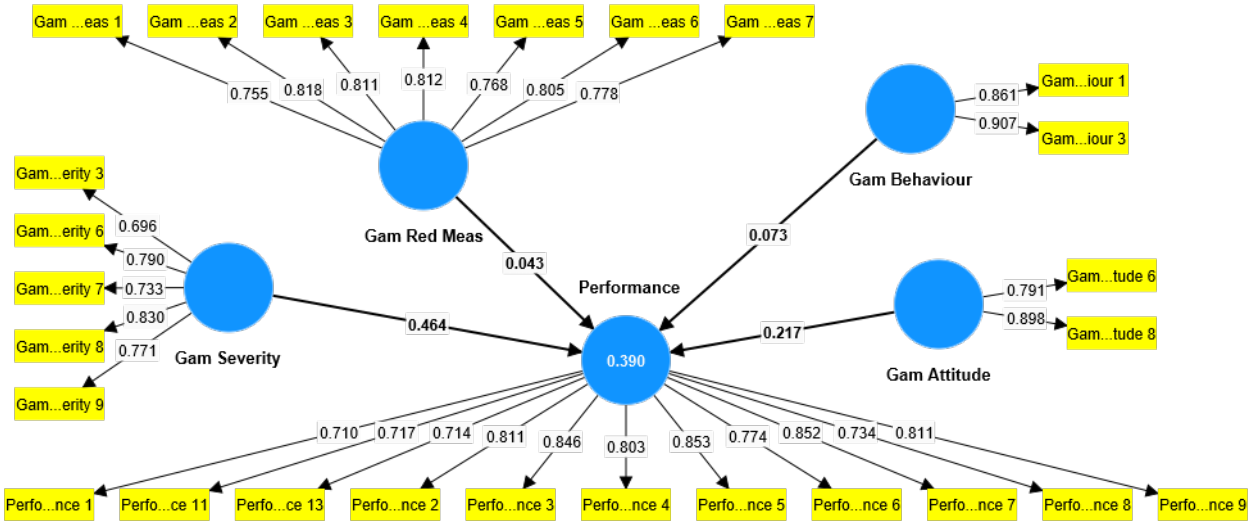

Figure 2: Factor loadings

Source: Authors' construct (2024)

Table 6: Effect Size

	F^2
Gam Attitude -> Performance	0.064
Gam Behaviour -> Performance	0.006
Gam Red Meas -> Performance	0.003
Gam Severity -> Performance	0.213

Source: Authors' construct (2024)

Structural model and hypothesis testing

The structural model was evaluated using path coefficients, t-statistics, confidence intervals, effect sizes (F^2), and predictive accuracy measures (R^2 and SRMR).

Table 7: Results of direct relationships

	Original sample (O)	T statistics	P values	CI 2.5%	CI 97.5%
Gam Attitude -> Performance	0.217	5.485	0.000	0.138	0.293
Gam Behaviour -> Performance	0.073	1.884	0.060	-0.001	0.151
Gam Red Meas -> Performance	0.043	1.487	0.137	-0.005	0.104
Gam Severity -> Performance	0.464	9.978	0.000	0.375	0.555

Source: Authors' construct (2024)

Table 8: Predictive accuracy and predictive relevance

	R^2	Adjusted R^2	SRMR
Performance	0.390	0.386	0.054

Source: Authors' construct (2024)

The effect size analysis (Table 6) shows that gambling severity has a large substantive impact ($F^2 = 0.213$), whereas gambling attitude exhibits a small effect. Also, the results on Table 7 indicate that gambling attitude has a significant effect on academic performance ($\beta = 0.217$, $p < 0.001$), while gambling severity exerts a strong and significant influence on performance ($\beta = 0.464$, $p < 0.001$). Meanwhile, gambling behaviour and gambling reduction measures did not show statistically significant effects on academic performance. The model (Table 8) explains approximately 39% of the variance in academic performance ($R^2 = 0.390$), indicating moderate predictive power.

Discussion

This study was aimed at examining the relationship between gambling and academic performance among university students, with four key hypotheses guiding the analysis. The results, as presented in Table 5, show that all the indicators have statistically significant loadings ranging from 0.696 to 0.907 at $p < 0.05$. The statistical significance of factor loadings suggests that gambling attitudes have a measurable impact on poor academic performance.

The first hypothesis examined the relationship between students' gambling attitudes and poor academic performance. It was found that

students' gambling attitude has a significant positive influence on poor academic performance ($\beta = 0.217$, $t = 5.485$, $p < 0.05$) (Table 7). The expected positive relationship implies that students who view gambling favourably perform poorly academically. Given that gambling is often associated with time misallocation, financial strain, and cognitive distractions (Derevensky & Griffiths, 2019).

Hypothesis two examined the relationship between students' gambling behaviour and poor academic performance. The results ($\beta = 0.073$, $t = 1.884$, $p > 0.05$) indicate that, unlike gambling attitudes (which showed a significant positive relationship with declining academic performance), gambling behaviour does not appear to be a strong predictor of poor academic success. The non-significant results suggest that while attitudes toward gambling may reflect cognitive or psychological traits linked to academic performance, actual gambling behaviour itself does not enhance or harm academic outcomes in a meaningful way. Meanwhile, a previous study by Acheampong *et al.* (2022) has shown that excessive gambling behaviour leads to absenteeism and poor concentration, hence, lower academic performance. It is therefore concluded that H_2 is not supported, as the relationship may exist, but its assumed positive direction is questionable.

For hypothesis three, it was found that a positive relationship exists between gambling severity and poor academic performance among university students. Given the significant statistical loadings ($\beta = 0.464$, $t = 9.978$, $p < 0.05$) (see Table 7), the results strongly support the hypothesis that gambling severity is positively related to poor academic performance. The positive relationship between these variables affirms the existing assertion that gambling is widely linked to academic decline due to financial distress, stress, and psychological impairment (Adu-Akoh, 2023; Ogachi *et al.,* 2020; Edjah *et al.,* 2022).

Hypothesis four tested if gambling reduction measures improve academic performance and found a positive relationship ($\beta = 0.043$, $t = 1.487$, $p > 0.05$) between the two variables (see Table 7). The results indicate that gambling reduction measures do not have a statistically significant positive impact on academic performance. While a weak positive trend exists, the effect is too small and unreliable to draw strong conclusions. Thus, the significant loadings suggest that gambling reduction measures do not play a crucial role in shaping academic outcomes. This finding does not align with previous studies (e.g., Dodig-Hundric *et al.,* 2021; Adu-Akoh, 2023) that indicate that restrictive policies, education on gambling risks, and access control may improve students' academic focus and overall well-being.

Our result here deviates from existing literature, probably because of universities' failure to integrate gambling policies into academic programs. Thus, when the universities propound social intervention policies in order to tick the checklist, they may not achieve the desired results. In Alam's (2022) study of psychological interventions in schools, for instance,

it was reported that many educational institutions fail to incorporate social interventions in their academic programs. Therefore, the mere existence of gambling reduction policies without a deliberate effort to engage problem gamblers may not contribute to gambling reduction. Moreover, solving problem gambling requires different intertwined measures as suggested by Riley *et al.* (2021). These scholars suggest that preventive measures be merged with rehabilitation support to achieve behavioural changes. Meanwhile, many Ghanaian universities lack trained clinical counsellors (Kyei & Nyarko, 2023).

We therefore conclude that institutional awareness programs complemented by strict enforcement, such as two-factor authentication, stringent financial strain interventions, and counselling support systems can contribute to gambling reduction, hence, improve academic performance (Odame *et al.,* 2021; Avenyo *et al.,* 2024).

Practical and theoretical implications

This study offers practical and theoretical insights for preventing problem gambling among students in higher education. Central to this effort is addressing the societal and individual factors that predispose students to gambling. The GST posits that economic hardship often drives individuals toward gambling as a coping mechanism (La Barbera & Ajzen, 2020). To reduce this risk, policy interventions such as conditional cash transfer programs for vulnerable families, like Brazil's *Bolsa Família*, can be effective in improving youth outcomes (Fiszbein & Schady, 2009). Furthermore, universities could expand educational scholarships and micro-grants to alleviate financial insecurity among low-income earning students, reducing their vulnerability to gambling.

Increased access to gambling platforms heightens the likelihood of student participation. Therefore, collaborating with Internet Service Providers or campus networks to enforce time-based or IP-based blocks on gambling sites/apps will reduce student participation (Zhou *et al.,* 2024). For example, universities may integrate gambling-site restrictions into campus Wi-Fi policies, limit access during lecture hours, and include betting platform filters within student digital portals. Zoning laws that limit the presence of gambling establishments near campuses may also reduce student involvement, as evidenced by South Korea’s regulatory success (Park *et al.,* 2019). These institutional and national-level interventions are essential in regulating exposure and minimizing the normalization of gambling within educational settings.

The TPB highlights the importance of altering subjective norms to influence behaviours. We therefore recommend that university administrators embark on awareness campaigns to educate students on gambling risks to academic performance and to promote healthier alternatives for stress relief. Such initiatives may include mandatory digital literacy and responsible gambling modules embedded in first-year orientation programs, peer-led discussion fora, and collaboration with

student unions to challenge pro-gambling norms on campus. Life skills training and emotional intelligence education integrated into the curriculum can further empower students to manage personal challenges constructively (Adu-Ako, 2023). Both GST and TPB emphasise the importance of a supportive environment; thus, educational institutions should provide accessible mental health services and offer rehabilitation support for students affected by problem gambling. Rehabilitation centres modelled on the UK's National Problem Gambling Clinic (Wardle *et al.,* 2019) could provide structured recovery paths and promote academic success.

Conclusion

Gambling addiction among Ghanaian university students is a growing public health concern. This study explored the effect of gambling on the academic performance of university students. The study drew data from about 644 students from a public university in Ghana. We underpinned the study with the GST and TPB frameworks to provide deeper insights into the relationship between university students' academic performance and gambling attitudes and behaviours, as well as problem gambling issues. We further tested the effectiveness of institutional gambling reduction measures on academic performance. The GST posits that individuals under significant strain, such as financial hardship, are more likely to engage in deviant behaviours like gambling as a coping mechanism. Meanwhile, TPB highlights the interplay of attitudes, subjective norms, and perceived behavioural control in influencing individual decisions, making it an effective lens for designing gambling prevention and intervention strategies.

Our results suggest that to address the growing concern of university students' problem gambling, a multifaceted approach that is rooted in the GST and TPB frameworks is necessary. These include addressing financial strain, regulating access to gambling platforms, and supporting gambling addicts with professional counselling services. Expanding scholarship programs and implementing targeted cash transfers can alleviate financial strain on economically vulnerable students, potentially reducing their reliance on gambling as a means of income. Simultaneously, enforcing stricter access regulations, such as gambling zoning laws around educational establishments, can create barriers to entry for students. Furthermore, investing in youth empowerment programs that focus on skills training and resilience-building initiatives can provide alternative pathways for students' financial security. These interventions align with theoretical underpinnings and provide actionable steps to build a healthier, more resilient future for university students.

Limitations and future research agenda

This study has some limitations that should be considered when interpreting the findings. First, the study relied on self-reported data, which may be subject to recall bias or social desirability effects, particularly given

the sensitive nature of gambling behaviour. Second, the data were collected from a single public university, which limits the generalizability of the results to other tertiary institutions in Ghana or similar contexts. Third, the cross-sectional research design restricts causal inference, as the observed relationships capture associations at a single point in time rather than behavioural changes over time.

These limitations provide opportunities for future research. Future studies could extend the analysis to multiple public and private universities across different regions of Ghana to improve external validity. Longitudinal research designs would be particularly valuable in assessing how gambling behaviour evolves over students' academic lifecycles and in evaluating the long-term effectiveness of intervention strategies. Additionally, future research may explore mediating and moderating variables such as social support systems, financial literacy, religious commitment, and institutional policy enforcement. Experimental or intervention-based studies that test specific university-led programs, such as counselling interventions, digital access controls, or financial support schemes, would further strengthen evidence-based policymaking in this area.

Data Availability Statement

The datasets generated and analyzed will be available by the corresponding author on reasonable request. Any request for data access will be subject to ethical approval and data-sharing agreements in accordance with institutional and research ethics guidelines.

Statement of Competing Interests

None.

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Ethics Approval

The Anglia Ruskin University Research Ethics Board approved the project, "Gambling and student academic performance," in August, 2024 (*Research Ethics Application Number: ETH2425-0085*).

Relative Contributions

All authors contributed equally to the study.

Research Promotion

This study investigates the relationship between gambling and academic performance among university students, focusing on the roles of gambling severity, attitudes, behaviours, and intervention strategies. The study found that problem gambling, shaped by students' psychological perceptions and emotional strain, poses a serious academic risk.

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