

When the Machine Writes the Answer: A PRISMA-Guided Systematic Review of the Fraud Hexagon and Academic Fraud in the Era of ChatGPT

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ABSTRACT

Purpose: This study systematically reviews recent empirical evidence on the six fraud hexagon factors (pressure, opportunity, rationalisation, capability, arrogance, and collusion) as drivers of academic fraud among university students, with particular attention to online learning and the misuse of ChatGPT and other generative artificial intelligence tools. It responds to inconsistent findings in accounting education research and to growing concern about the integrity of future accounting professionals.

Method: The review follows the PRISMA 2020 statement. Five search strings were run in the Crossref database for peer-reviewed journal articles published between 2020 and 2024 with abstracts available, and citation tracking added key studies cited in the original research proposal. Records were de-duplicated, screened by title, and assessed for eligibility against predefined criteria. The included studies were coded by country, sample, design, learning context, and the direction of each fraud factor, and were synthesised through vote counting and thematic analysis.

Findings: The classic fraud triangle factors, namely pressure, opportunity, and rationalisation, remain the most frequently supported drivers, especially in online examinations and in the misuse of ChatGPT, where grade pressure, workload, easy access, and the belief that artificial intelligence is merely a tool are recurring themes. Capability and collusion are the most consistent of the newer hexagon factors when all six are modelled together, whereas arrogance is rarely significant. Findings within full hexagon models are fragmented, which suggests overlap among the factors and sensitivity to context and measurement.

Implication: Universities and accounting programmes should redesign assessment to reduce opportunity, publish clear policies on acceptable artificial intelligence use, address the rationalisations that normalise misuse, and design group work that discourages collusion. Ethics education should explicitly connect academic integrity with the professional code of ethics for accountants. Researchers should measure behaviour as well as intention and test interactions among the fraud factors.

Originality: The review is among the first to synthesise fraud hexagon evidence on academic fraud across conventional, online, and generative artificial intelligence settings, to show how the relevance of each factor shifts across these contexts, and to propose an agenda for studying artificial intelligence-assisted academic fraud among accounting students in Indonesia.

Keywords: Academic Fraud, Accounting Students, ChatGPT, Fraud Hexagon, Generative Artificial Intelligence, PRISMA.

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INTRODUCTION

The rapid diffusion of generative artificial intelligence (AI) has changed the way students learn, write, and complete assessments. ChatGPT, released at the end of 2022, quickly attracted global attention because it can produce fluent answers, essays, and calculations in seconds. By September 2024, it was reported to have about 200 million weekly active users, roughly double the figure of a year earlier (Wardani, 2024). In higher education, these tools offer genuine benefits, including personalised



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explanations, writing support, and quick access to information (Kasneci et al., 2023; Lo, 2023). At the same time, they pose a serious challenge to academic integrity, because students can submit AI-generated work as their own with a low risk of detection (Cotton et al., 2024; Perkins, 2023; Sullivan et al., 2023).

Academic fraud refers to deliberate dishonest acts by students, staff, or educators that seek personal or group advantage in academic work. It includes cheating in examinations and assignments, plagiarism, data fabrication, unauthorised access to assessment materials, and unauthorised collaboration (Alshurafat et al., 2024; Smith et al., 2023). Academic fraud in accounting education deserves special attention. Accounting graduates are expected to uphold honesty, objectivity, and professional behaviour, principles that are codified in the professional code of ethics for Indonesian accountants (Ikatan Akuntan Indonesia, 2021). Evidence that accounting and business students may be more inclined than students from other fields to view assignment assistance as acceptable (Kelly et al., 2022) therefore raises concerns about the integrity of future professionals.

The link between education and fraud is also visible in professional practice. The Indonesia Fraud Survey conducted by the Indonesian chapter of the Association of Certified Fraud Examiners found that most fraud perpetrators held a university degree, with bachelor's degree holders accounting for 73.2% of cases, followed by master's degree holders at 17.2% (Association of Certified Fraud Examiners Indonesia Chapter, 2020), as shown in Figure 1. These data suggest that academic achievement alone does not guarantee ethical behaviour. The concern has also been voiced at the national level: commenting on the use of ChatGPT to write undergraduate theses, the then President of Indonesia emphasised that high grades are meaningless without sound morals (Ramadhan & Rastika, 2023).

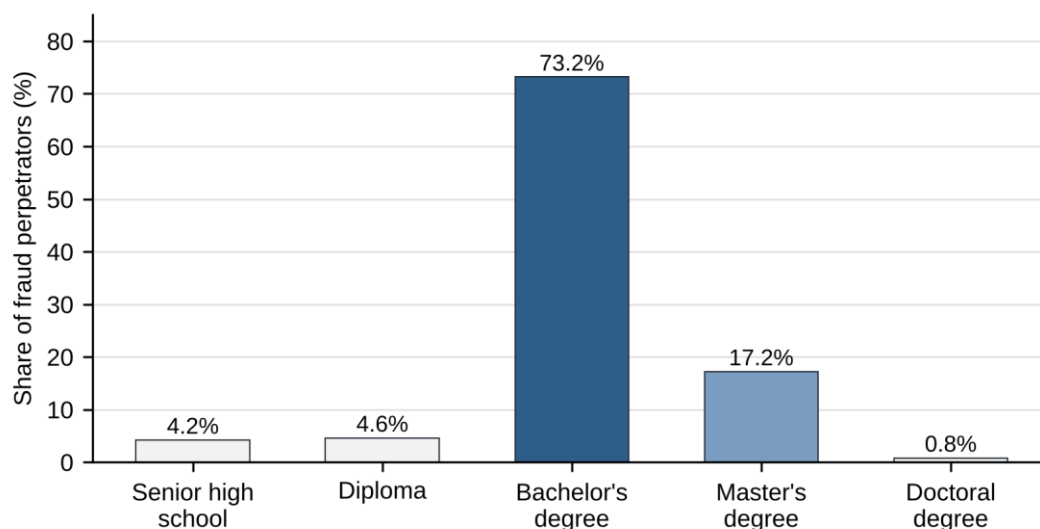


Figure 1. Educational Background of Fraud Perpetrators in Indonesia

Source: Redrawn from the research proposal based on Association of Certified Fraud Examiners Indonesia Chapter (2020)

Fraud theory offers a useful lens for understanding why students commit academic fraud. The fraud triangle explains fraud through pressure, opportunity, and rationalisation; the fraud diamond adds capability; the fraud pentagon adds arrogance; and the fraud hexagon, also known as the S.C.C.O.R.E. model, adds collusion, reflecting the observation that many frauds involve several actors acting together (Nugroho & Diyanty, 2022; Omukaga, 2021). The hexagon has been applied widely to corporate financial statement fraud and, more recently, to academic fraud among accounting students (Theotama et al., 2023; Moorcy et al., 2024). This article grows out of a research proposal that planned to test the effect of the six hexagon factors on academic fraud using ChatGPT among accounting students in Surabaya, a city with a large concentration of higher education institutions, 34 of which offer accounting programmes (Directorate General of Higher Education, Research, and Technology, 2024).

Existing empirical findings are, however, inconsistent. Theotama et al. (2023) found that only rationalisation significantly affected accounting students' intention to commit academic fraud. Moorcy et al. (2024) found that rationalisation and capability mattered, while pressure, opportunity, ego, and collusion did not. Affandi et al. (2022) reported that pressure, collusion, and opportunity influenced academic fraud during online learning, but capability, rationalisation, and ego did not. In the specific

context of ChatGPT, [Alshurafat et al. \(2024\)](#) found that all three fraud triangle factors contributed to accounting students' misuse of the tool. Such inconsistencies make it difficult for educators to decide which factors to target and for researchers to design cumulative studies. Although several reviews have discussed the implications of ChatGPT for academic integrity ([Cotton et al., 2024](#); [Lo, 2023](#); [Perkins, 2023](#)), they do not systematically synthesise the empirical evidence on the fraud factors that drive dishonest behaviour, nor do they compare conventional, online, and AI-assisted settings.

This study addresses that gap through a systematic literature review guided by the PRISMA 2020 statement ([Page et al., 2021](#)). It is organised around three research questions:

RQ1: What are the characteristics of recent empirical studies (2020–2024) that apply the fraud triangle, diamond, pentagon, or hexagon to students' academic fraud?

RQ2: What is the direction and consistency of the evidence for each hexagon factor, and how does it differ across conventional, online, and AI-assisted settings?

RQ3: What explains the inconsistent findings, and what should future research, educators, and institutions prioritise?

The review makes three contributions. Theoretically, it evaluates the explanatory value of each hexagon factor and shows how their relevance shifts with the learning context. Methodologically, it identifies measurement and modelling choices that contribute to inconsistent results. Practically, it offers evidence-based recommendations for accounting programmes seeking to protect academic integrity in the era of generative AI.

LITERATURE REVIEW

Academic Fraud and AI-Assisted Misconduct

Academic fraud encompasses a range of behaviours, from copying answers during examinations to submitting work written by others. The shift to online learning during the COVID-19 pandemic expanded opportunities for cheating, as remote examinations reduced supervision and made it easier to consult unauthorised sources or collaborate secretly ([Ebaid, 2021](#); [Bierstaker et al., 2024](#)). Generative AI introduces a new form of misconduct. Unlike contract cheating, which requires paying a third party, AI tools are free or inexpensive, instantly available, and produce original-looking text that is difficult to detect with conventional plagiarism software ([Cotton et al., 2024](#)). The boundary between legitimate assistance and misconduct is also blurred: using AI to understand a concept may be acceptable, whereas submitting AI-generated answers as one's own work is not. This ambiguity creates fertile ground for rationalisation ([Sullivan et al., 2023](#); [Perkins, 2023](#)).

Academic Integrity and the Accounting Profession

Academic integrity is particularly important in accounting education because the profession is built on public trust. Accountants prepare, audit, and interpret information on which investors, creditors, regulators, and the public rely, and the code of ethics requires them to act with integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour ([Ikatan Akuntan Indonesia, 2021](#)). Universities are the first place where these values are formed and tested. Students who become accustomed to obtaining grades through dishonest means may carry the same habits into professional settings, where the consequences are far greater. Research on business and accounting students shows that attitudes towards assignment assistance and online cheating are shaped by perceived norms, personality traits, and the perceived seriousness of misconduct ([Kelly et al., 2022](#); [Smith et al., 2023](#)). The prominence of university graduates among fraud perpetrators in Indonesia ([Association of Certified Fraud Examiners Indonesia Chapter, 2020](#)) reinforces the argument that integrity must be cultivated alongside technical competence. Generative AI makes this task more urgent, because it allows students to bypass the very learning processes through which professional judgement is developed.

Fraud Hexagon Theory

The fraud hexagon integrates six factors. Pressure (stimulus) is the motivation to commit fraud, such as the desire for high grades, scholarship requirements, parental expectations, or heavy workloads. Opportunity arises from weak controls, such as limited supervision, poorly designed assessments, or easy access to tools that can complete tasks. Rationalisation is the process by which individuals justify

dishonest behaviour, for example by believing that "everyone does it" or that a tool is merely an aid. Capability refers to the skills and traits that enable a person to commit fraud and suppress guilt, including technical skills and confidence. Arrogance, or ego, reflects a sense of superiority and the belief that rules do not apply or that sanctions can be avoided. Collusion refers to agreements between two or more people to act dishonestly (Nugroho & Diyanty, 2022; Theotama et al., 2023). Earlier models, from the triangle to the pentagon, remain widely used, and studies of fraud in other settings show that their dimensions may operate differently across institutional contexts (Omukaga, 2021).

The Hexagon in the Context of ChatGPT

Each hexagon factor can be interpreted in the context of AI-assisted academic fraud. Pressure may arise from the expectation to produce perfect assignments quickly, especially when deadlines accumulate. Opportunity is created by the easy availability of AI tools and by assessment formats that can be completed by them. Rationalisation is supported by the belief that AI is simply a learning aid that harms no one and by the observation that peers use it without penalty (Alshurafat et al., 2024). Capability includes the digital and prompting skills needed to obtain useful outputs and to disguise their origin. Arrogance may manifest as the belief that one can outsmart detection systems or lecturers. Collusion may take the form of sharing AI-generated answers or prompts among classmates, scaling up the misconduct. The interaction between personality traits and fraud factors has also been examined, for example through the dark triad (Gautama et al., 2023; Smith et al., 2023).

Moderating Factors: Religiosity, Spirituality, and Institutional Policy

The fraud hexagon describes the conditions under which fraud becomes more likely, but it does not determine behaviour mechanically. Personal values and institutional arrangements can strengthen or weaken the influence of each factor. Religiosity and spirituality are frequently proposed as internal restraints: students who hold strong religious or spiritual commitments may resist pressure and refrain from exploiting opportunities even when they could do so without detection (Sholikhah et al., 2024; Sososutiksno et al., 2023). However, spirituality does not always protect against social influence, particularly when cheating becomes a shared practice among peers (Affandi et al., 2022). Institutional policies, such as honour codes, sanctions, and proctoring, aim to reduce opportunity and to signal that dishonesty is unacceptable. Their effectiveness depends on whether students understand and support the policies and on whether the policies are perceived as credible (Janinovic et al., 2024). These moderating factors help to explain why the same hexagon factor may be significant in one institution but not in another.

Integrative Framework

Figure 2 presents the framework that guides the review. It adapts the conceptual model of the original research proposal, in which each of the six hexagon factors was hypothesised to increase academic fraud using ChatGPT (H1–H6), and adds boundary conditions such as institutional policy, assessment design, and religiosity or spirituality, which emerged as moderators in several studies.

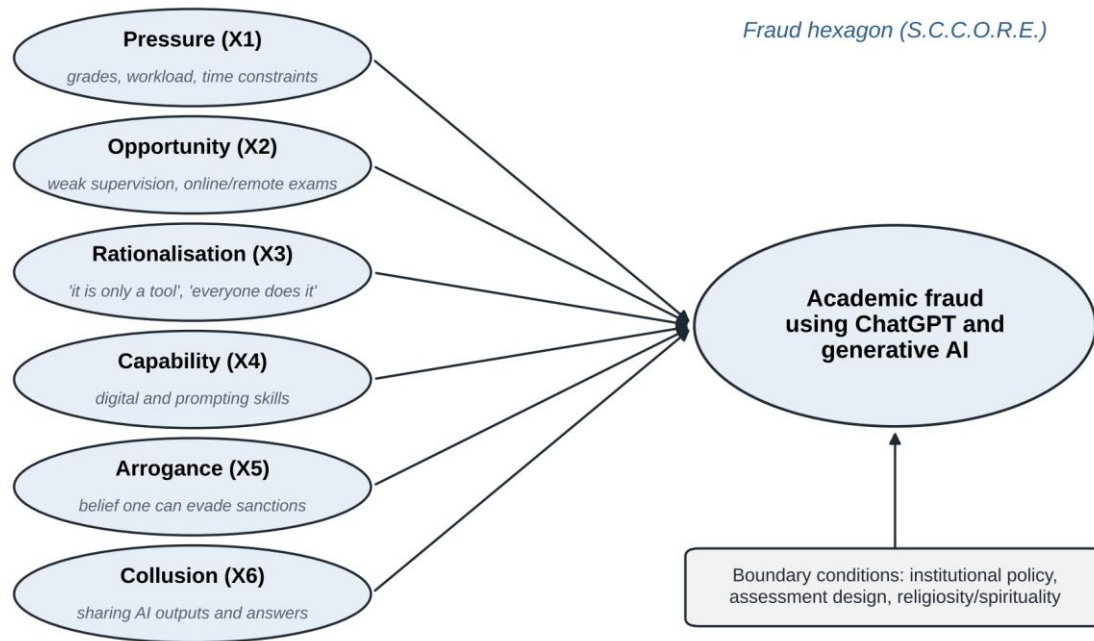


Figure 2. Integrative Fraud Hexagon Framework for Academic Fraud Using ChatGPT

Source: Adapted from the research proposal framework and [Theotama et al. \(2023\)](#)

RESEARCH METHOD

Review Design

This study is a systematic literature review reported in accordance with the PRISMA 2020 statement ([Page et al., 2021](#)). A systematic design was chosen because the research questions concern the direction and consistency of evidence across primary studies, which requires a transparent and replicable procedure for identifying, selecting, and synthesising the literature ([Kraus et al., 2020](#)). The protocol is summarised in [Table 1](#).

Table 1. Review Protocol: Search Strategy and Eligibility Criteria

Component	Specification
Database	Crossref (journal articles with DOI and abstract metadata); citation tracking as a supplementary method
Search strings	"fraud hexagon" + "academic fraud" + "students"; "ChatGPT" + "academic integrity" + "cheating" + "students"; "fraud pentagon" + "academic dishonesty" + "accounting students"; "ChatGPT" + "misuse" + "students" + "academic misconduct"; "fraud triangle" + "academic cheating" + "online" + "students"
Time window	2020–2024
Inclusion criteria	(1) peer-reviewed journal article; (2) empirical (quantitative, qualitative, mixed, or field) study of students' academic fraud, cheating, or AI misuse; (3) examines at least one fraud-model factor (pressure, opportunity, rationalisation, capability, arrogance, collusion) or technology/AI misuse as a determinant; (4) abstract available
Exclusion criteria	corporate financial statement fraud; conceptual papers, editorials, and news reports; studies of detection tools or interventions without determinant tests; studies whose outcome is not academic fraud (e.g., whistleblowing)
Coding	country and sample; design; learning context (conventional, online, AI-assisted); direction of each factor (increases academic fraud, reduces it, not significant, significant or present with unspecified direction)

Source: Developed by the authors following [Page et al. \(2021\)](#) and [Kraus et al. \(2020\)](#)

Information Source and Search Strategy

The primary information source was Crossref, a multidisciplinary metadata index covering international and Indonesian journals with digital object identifiers, including many journals indexed in Scopus, Web of Science, and SINTA. The search was carried out in October 2026 with five search strings combining fraud hexagon, fraud pentagon, and fraud triangle terms with academic fraud, academic dishonesty, online cheating, and ChatGPT. Results were limited to journal articles published between 1 January 2020 and 31 December 2024 with an abstract available in the metadata. For each search string, the records returned by the relevance ranking were exported and screened. Because research on ChatGPT and academic fraud is new and dispersed, backward citation tracking was applied to the original research proposal to capture influential studies not retrieved by the database query.

Study Selection, Data Extraction, and Synthesis

Records were de-duplicated by DOI and by content, including one news report syndicated under six DOIs. Titles were screened to remove studies outside the scope, most of which addressed corporate financial statement fraud. Abstracts and metadata of the remaining records were assessed against the eligibility criteria, and screening decisions and reasons for exclusion were recorded in a screening log. Uncertain cases were resolved through discussion among the authors.

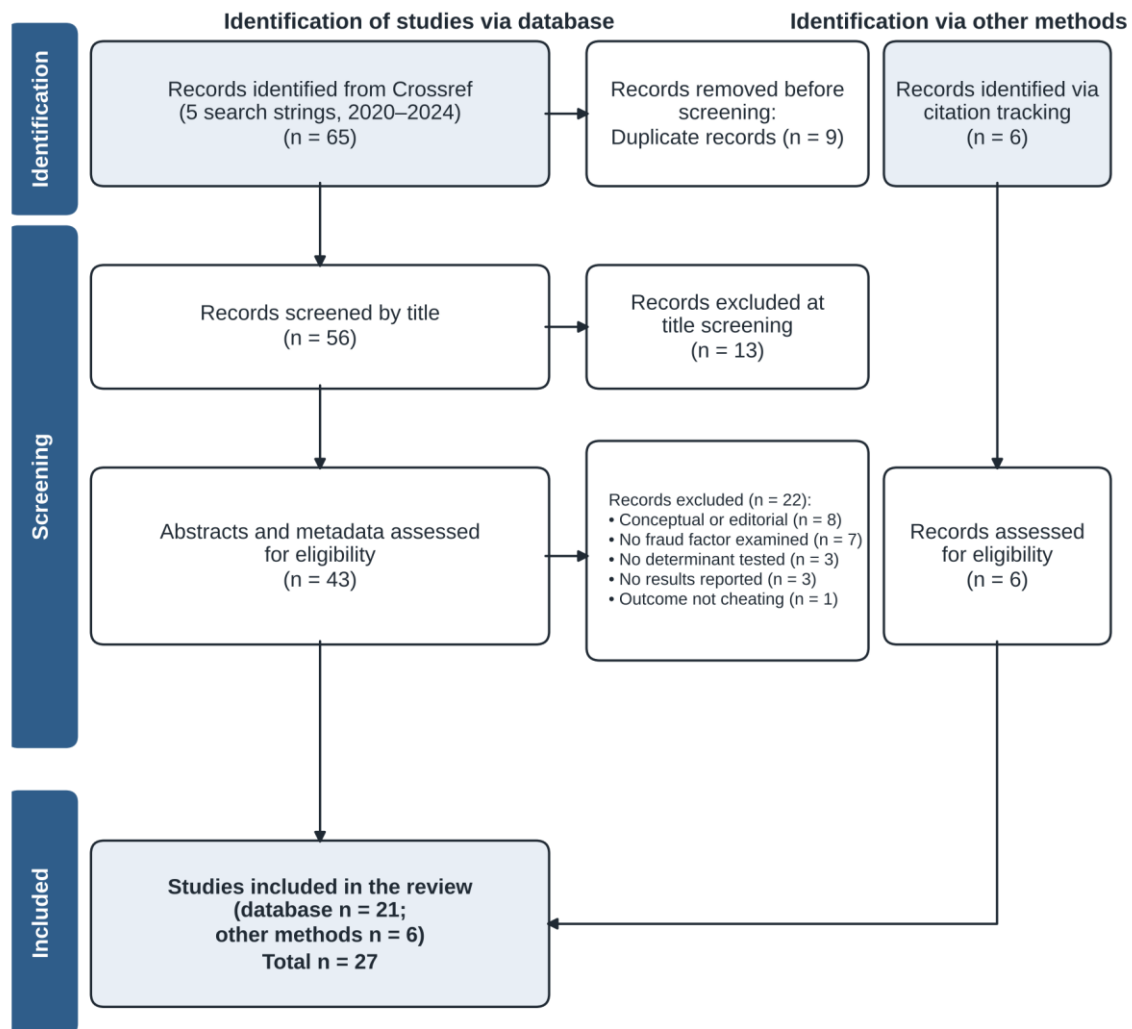


Figure 3. PRISMA 2020 Flow Diagram of Study Selection

Source: Developed by the authors based on [Page et al. \(2021\)](#)

For each included study, the authors extracted the country and sample, the design, the learning context, and the direction and significance of each fraud factor. Effects were coded from the perspective of academic fraud: a factor was coded as increasing fraud when higher levels were associated with more cheating or misuse, as reducing fraud when the reverse was reported, as not significant when no significant effect was found, and as significant or present with unspecified direction when an abstract reported significance, or a qualitative study reported the factor as a theme, without stating a direction. Studies were also classified by learning context: conventional academic fraud, online learning and examinations, and ChatGPT, AI, or digital misuse. Because of the heterogeneity of designs and measures, the evidence was synthesised through vote counting complemented by thematic analysis.

The database search identified 65 records. After the removal of nine duplicates, 56 unique records were screened by title, and 13 were excluded, most of them studies of corporate financial statement fraud. The abstracts and metadata of 43 records were assessed for eligibility. Twenty-two records were excluded: eight were conceptual papers or editorials, seven did not examine any fraud-model factor, three did not test any determinant (a detection-tool evaluation, an intervention log analysis, and an incomplete record), three reported no empirical results, and one examined whistleblowing rather than cheating. Twenty-one studies from the database met all criteria. Citation tracking added six studies, including the ChatGPT study by [Alshurafat et al. \(2024\)](#), the generative AI study by [Abbas et al. \(2024\)](#), and four Indonesian studies of the fraud pentagon and hexagon. In total, 27 studies were included in the synthesis ([Figure 3](#)).

RESULTS AND DISCUSSION

Characteristics of the Included Studies (RQ1)

[Table 2](#) summarises the 27 included studies. Research activity has accelerated, with one study published in 2020, two in 2021, six in 2022, seven in 2023, and 11 in 2024. Eighteen studies were conducted solely in Indonesia, covering accounting students in Surabaya, Malang, Madura, Salatiga, Jakarta, Banjarmasin, Makassar, Ambon, and other cities. The remaining studies come from Jordan, Pakistan, North Macedonia, Montenegro, Canada, the United States, Brazil, and a multi-country sample from Indonesia, Malaysia, and Thailand. Most studies are questionnaire surveys analysed with multiple linear regression, moderated regression, or partial least squares structural equation modelling, while a smaller group uses qualitative interviews, mixed methods, or field comparisons of examination settings ([Bierstaker et al., 2024](#); [Sallaberry et al., 2023](#); [Yovanka & Sugiarti, 2024](#)).

Table 2. Summary of the Included Studies

Study	Context and sample	Design	Factors (direction)
Firmansyah & Oktarina (2023)	Indonesia; 153 accounting students	Survey, SEM-PLS	PRE (N), OPP (N), RAT (N), CAP (U), ARR (U), COL (U)
Dewa & Maulana (2024)	Indonesia (Java); 247 accounting students, 34 universities	Survey, SEM-PLS	PRE (U), OPP (N), RAT (N), CAP (U), ARR (N), COL (U)
Oktarina & Ramadhan (2023)	Indonesia (Surabaya); accounting students	Online survey, MLR	PRE (N), OPP (P), RAT (N), CAP (P), ARR (N), COL (P)
Agustan & Wayhuni (2024)	Indonesia; accounting students	Survey, regression	PRE (P), OPP (P), RAT (P), ARR (N), COL (N)
Nailah & Murtanto (2023)	Indonesia (Jakarta); 103 accounting students	Survey, MLR	PRE (N), OPP (N), RAT (N), CAP (N), ARR (U), COL (U), TEC (N)
Theotama et al. (2023)	Indonesia (Salatiga); 270 accounting students	Online survey, MLR	PRE (N), OPP (N), RAT (U), CAP (N), ARR (N), COL (N)
Moorcy et al. (2024)	Indonesia (Banjarmasin); 120 accounting students	Online survey, MLR	PRE (N), OPP (N), RAT (U), CAP (U), ARR (N), COL (N)
Shalevska & Kostadinovska-Stojchevska (2024)	North Macedonia; 114 undergraduates	Mixed methods	PRE (P), RAT (P)
Janinovic et al. (2024)	Montenegro; 486 university students	Survey, moderated regression	OPP (N)
Ferguson et al. (2023)	Canada; community college students	Self-report survey	PRE (U)
Walsh et al. (2024)	United States; 1,640 students and faculty	E-survey, mixed methods	RAT (U), COL (U)

Study	Context and sample	Design	Factors (direction)
Mardiana & Holly (2022)	Indonesia (Makassar); 120 accounting students	Survey, regression	PRE (N), OPP (U), RAT (D)
Puspitosari (2022)	Indonesia (Surakarta); 203 accounting students	Survey, MLR	PRE (P), OPP (P), RAT (N)
Savilia & Laily (2020)	Indonesia; 220 accounting students	Survey, MR	PRE (P), OPP (P), RAT (P)
Rachma & Diptyana (2022)	Indonesia; accounting students	Survey, SEM-PLS	PRE (P), OPP (P), RAT (N), CAP (P)
Sallaberry et al. (2023)	Brazil; accounting students	Qualitative interviews (TPB)	OPP (U), RAT (U)
Yovanka & Sugiarti (2024)	Indonesia; students and lecturers, private university	Qualitative (questionnaire and interviews)	PRE (P), OPP (P), RAT (P), ARR (P), COL (U)
Sholikhah et al. (2024)	Indonesia, Malaysia, Thailand; 339 students	Online survey, MRA	OPP (P)
Bierstaker et al. (2024)	Accounting students; online and remote-evaluation exams	Field comparison	OPP (P), RAT (P)
Sososutiksno et al. (2023)	Indonesia (Ambon); 92 accounting students	Survey, MRA	PRE (P), OPP (P), RAT (P)
Juliardi et al. (2021)	Indonesia (Malang); 30 accounting students	Survey, MLR	PRE (N), OPP (N), RAT (N), TEC (P)
Alshurafat et al. (2024)	Jordan; 279 accounting students	Online survey, PLS-SEM	PRE (P), OPP (P), RAT (P), TEC (P)
Affandi et al. (2022)	Indonesia (Madura); 191 accounting students	Online survey, MRA	PRE (U), OPP (U), RAT (N), CAP (N), ARR (N), COL (P)
Hardiana et al. (2021)	Indonesia; 178 accounting students (APRODIKSI members)	Online survey, descriptive-verify	PRE (P), OPP (P), RAT (P), CAP (P), ARR (P)
Asih & Sunaryanto (2022)	Indonesia (Malang); 237 accounting students	Online survey, MLR	PRE (P), OPP (N), RAT (P), CAP (P), ARR (N)
Rafnhar & Muslimin (2022)	Indonesia (Surabaya); 82 accounting students	Survey, MLR	PRE (N), OPP (N), RAT (P), CAP (P), ARR (N)
Abbas et al. (2024)	Pakistan; university students	Survey	PRE (P), TEC (P)

Source: Authors' synthesis. PRE = pressure; OPP = opportunity; RAT = rationalisation; CAP = capability; ARR = arrogance; COL = collusion; TEC = technology/AI misuse. P = increases academic fraud; D = reduces; N = not significant; U = significant or present, direction unspecified. MLR = multiple linear regression; MRA = moderated regression analysis.

In terms of theoretical framing, seven studies tested all six hexagon factors, while the others used the triangle, diamond, or pentagon, or examined selected factors. Twelve studies addressed conventional academic fraud, nine addressed online learning or examinations, and six addressed ChatGPT, AI, or digital misuse. The number of AI-specific studies is still small, which confirms that empirical research on AI-assisted academic fraud is at an early stage.

Direction and Consistency of the Evidence (RQ2)

Table 3 and Figure 4 summarise the coded effects across all 27 studies, and Table 4 compares the share of studies reporting a significant or present effect across the three learning contexts.

Table 3. Vote Count of Effect Directions by Fraud Factor

Factor	Studies	Increases academic fraud	Reduces academic fraud	Not significant	Significant/present, unspecified
Pressure	22	11	0	8	3
Opportunity	23	11	0	9	3
Rationalisation	23	10	1	8	4
Capability	11	5	0	3	3
Arrogance (ego)	12	2	0	8	2
Collusion	10	2	0	3	5
Technology / AI misuse	4	3	0	1	0

Source: Authors' coding of 27 included studies. A study may examine more than one factor.

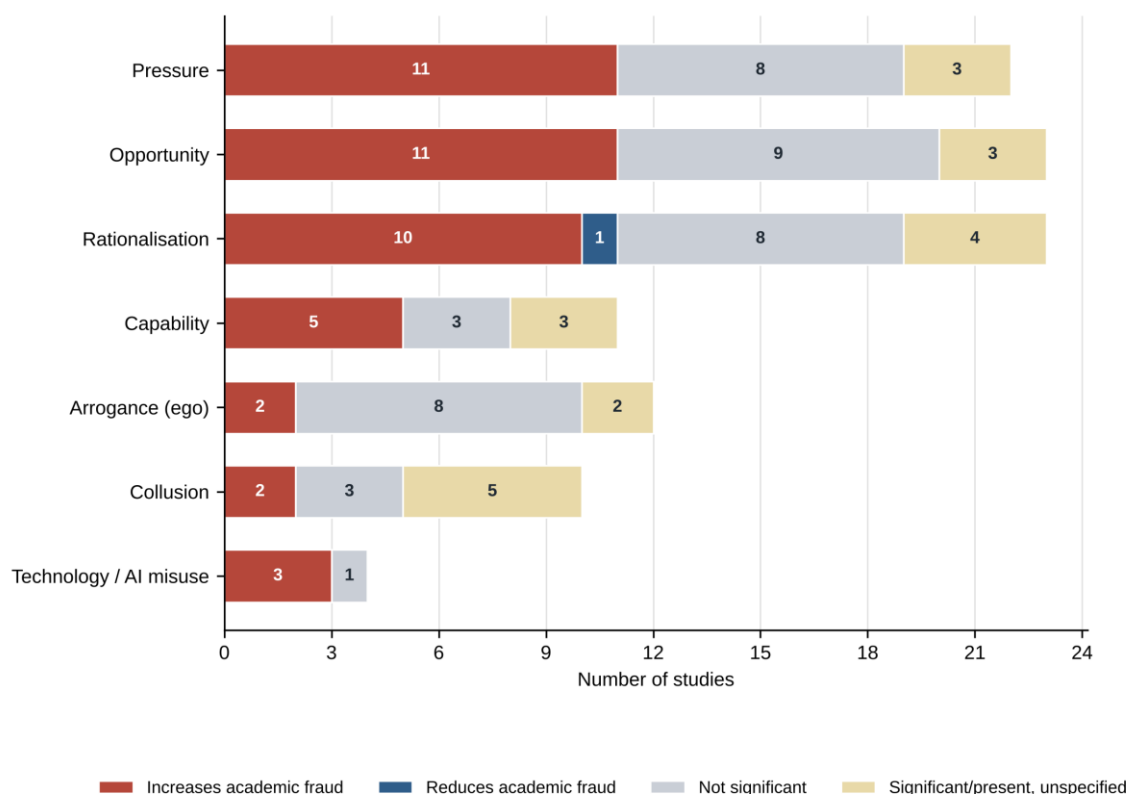


Figure 4. Distribution of Effect Directions across the Fraud Factors

Source: Authors' coding of 27 included studies

Table 4. Share of Studies Reporting a Significant or Present Effect by Learning Context

Context	Studies	PRE	OPP	RAT	CAP	ARR	COL	TEC
Conventional academic fraud	12	5/10	6/11	6/10	6/6	2/7	3/5	–
Online learning and examinations	9	5/6	6/8	6/8	1/3	1/4	3/4	–
ChatGPT, AI, and digital misuse	6	4/6	2/4	2/5	1/2	1/1	1/1	3/4

Source: Authors' coding. Each cell shows the number of studies reporting a significant or present effect over the number of studies that examined the factor.

Pressure: the dominant driver in online and AI settings

Pressure was examined in 22 studies, of which 11 found that it increased academic fraud and three reported significant or present effects without a direction. Its influence is most visible in online and AI-assisted settings, where five of six online studies and four of six AI studies reported a significant or present pressure effect. Accounting students in Jordan misused ChatGPT partly because of academic pressure ([Alshurafat et al., 2024](#)), and students in North Macedonia cited grade pressure and time constraints as reasons for using ChatGPT without disclosure ([Shalevska & Kostadinovska-Stojchevska, 2024](#)). In Pakistan, academic workload and time pressure increased students' use of generative AI, and heavier use was in turn associated with procrastination and weaker academic performance ([Abbas et al., 2024](#)). Pressure also increased digital academic dishonesty and online cheating among Indonesian accounting students ([Rachma & Diptyana, 2022](#); [Puspitosari, 2022](#); [Sososutiksno et al., 2023](#)). In Canada, stressful life events were linked to contract cheating ([Ferguson et al., 2023](#)).

By contrast, pressure was not significant in eight studies, most of them full hexagon models of conventional academic fraud ([Theotama et al., 2023](#); [Moorcy et al., 2024](#); [Oktarina & Ramadhan, 2023](#)). One explanation is that pressure is a necessary but not sufficient condition: it motivates fraud only when opportunity and justification are also present. When these other factors are modelled simultaneously, the unique contribution of pressure may disappear.

Opportunity: shaped by assessment design and supervision

Opportunity was examined in 23 studies, with 11 reporting that it increased academic fraud and three reporting significant or present effects without a direction. Its role is particularly clear in online settings. A comparison of examination settings found that cheating was higher in online examinations and that proctoring software reduced, but did not eliminate, cheating (Bierstaker et al., 2024). In a multi-country study, opportunity increased online cheating, although spirituality weakened this effect even when students perceived their lecturers as unfair (Sholikhah et al., 2024). Religiosity similarly weakened the effects of pressure and opportunity on academic fraud in online lectures (Sososutiksno et al., 2023). Opportunity also drove ChatGPT misuse and digital dishonesty (Alshurafat et al., 2024; Rachma & Diptyana, 2022).

Nine studies found no significant effect of opportunity, including several hexagon studies of conventional fraud (Firmansyah & Oktarina, 2023; Dewa & Maulana, 2024; Theotama et al., 2023) and a study of institutional policies in Montenegro, where the severity of punishment did not change students' perceptions of the seriousness of cheating, while honour codes had only a mild effect (Janinovic et al., 2024). These results suggest that perceived opportunity is shaped more by the design of assessment and the visibility of controls than by formal rules. When assessments can be completed easily by AI and detection is unlikely, opportunity is high regardless of the severity of the stated sanctions.

Rationalisation: the language of normalisation

Rationalisation was examined in 23 studies, with ten reporting that it increased academic fraud and four reporting significant or present effects without a direction. It was the only significant factor in the full hexagon model of Theotama et al. (2023) and one of two significant factors in Moorcy et al. (2024) and Rafnhar & Muslimin (2022). In AI settings, rationalisation takes distinctive forms: students justify ChatGPT use as a learning aid that harms no one and point to peers who use it without consequences (Alshurafat et al., 2024; Shalevska & Kostadinovska-Stojchevska, 2024). Qualitative studies in Brazil and the United States show that students believe cheating improves grades and reduces effort, and that what faculty call cheating, students often describe as teamwork (Sallaberry et al., 2023; Walsh et al., 2024). Proctoring and honour codes reduced perceived rationalisation in online examinations (Bierstaker et al., 2024).

Eight studies found no significant effect of rationalisation, and one found a negative effect (Mardiana & Holly, 2022). Rationalisation is difficult to measure through self-reports, because respondents may be reluctant to endorse justifications for dishonesty, which can weaken observed effects.

Capability: the most consistent newer factor

Capability was examined in 11 studies and was significant or present in eight, with five reporting a positive effect. It was significant in four of the seven full hexagon studies (Firmansyah & Oktarina, 2023; Dewa & Maulana, 2024; Oktarina & Ramadhan, 2023; Moorcy et al., 2024) and in pentagon studies of accounting students (Asih & Sunaryanto, 2022; Hardiana et al., 2021; Rafnhar & Muslimin, 2022). Capability also increased digital academic dishonesty (Rachma & Diptyana, 2022). In the AI era, capability includes the ability to formulate effective prompts, edit outputs to avoid detection, and remain composed when questioned. Its consistency suggests that interventions should not only discourage misuse but also teach students to use AI transparently and responsibly.

Arrogance: rarely significant

Arrogance was examined in 12 studies and was not significant in eight. It increased academic fraud in two studies (Hardiana et al., 2021; Yovanka & Sugiarti, 2024) and was significant without a stated direction in two others (Firmansyah & Oktarina, 2023; Nailah & Murtanto, 2023). Arrogance overlaps conceptually with capability, since both involve confidence in one's ability to commit fraud without being caught. In student samples, arrogance may also be poorly captured by self-report scales, because few students are willing to describe themselves as superior to rules.

Collusion: a social dimension amplified by technology

Collusion was examined in ten studies and was significant or present in seven. It was significant in five of the seven full hexagon studies, more often than any other factor in these models (Affandi et al., 2022; Dewa & Maulana, 2024; Firmansyah & Oktarina, 2023; Nailah & Murtanto, 2023; Oktarina & Ramadhan, 2023). Qualitative evidence shows that collusion is common in online learning (Yovanka & Sugiarti,

2024) and that students often perceive collaboration on individual tasks as legitimate teamwork (Walsh et al., 2024). Interview research with accounting students has similarly revealed the social dynamics through which collusion is organised (Shrader et al., 2021). In the AI context, collusion may take the form of sharing prompts and outputs, which can multiply the reach of a single act of misconduct.

Technology and AI misuse as a distinct factor

Four studies examined technology or AI misuse as a separate determinant, and three found that it increased academic fraud. Misuse of information technology was the only significant predictor of academic cheating among accounting students in Malang during the pandemic (Juliardi et al., 2021), and generative AI misuse was explained by the fraud triangle among Jordanian students (Alshurafat et al., 2024). In Pakistan, workload-driven AI use was linked to procrastination and weaker academic performance (Abbas et al., 2024). Only one study found no significant effect of IT misuse (Nailah & Murtanto, 2023). These findings suggest that AI is not merely a context in which the hexagon factors operate but a factor that reshapes them, by creating new opportunities, lowering the skill threshold for fraud, and providing new rationalisations.

Institutional responses: what the evidence says about deterrence

Several included studies offer insight into the effectiveness of institutional responses. In remote examinations, proctoring software reduced cheating but did not eliminate it, while honour codes did not reduce cheating itself; nevertheless, both measures lowered students' perceived opportunity and rationalisation (Bierstaker et al., 2024). In Montenegro, honour codes had a positive but mild effect on how seriously students viewed cheating, harsher punishment had no effect, and students' understanding of policies strengthened both effects (Janinovic et al., 2024). Personal values also played a role: spirituality and religiosity weakened the influence of opportunity and pressure in some samples (Sholikhah et al., 2024; Sososutiksno et al., 2023), although not in a study conducted during online learning (Affandi et al., 2022). Taken together, these results suggest that deterrence works best when it reduces opportunity in practice and when students understand and accept the reasons behind integrity rules. Severe sanctions alone appear insufficient, particularly when students rationalise AI use as legitimate assistance and when detection remains uncertain (Cotton et al., 2024).

Explaining the Inconsistencies (RQ3)

The evidence points to five explanations for the inconsistent results. The first is model specification. In the seven full hexagon studies, pressure, opportunity, rationalisation, and arrogance were each significant in only two studies, while collusion and capability were significant in five and four, respectively. In studies that modelled only the triangle factors, by contrast, pressure, opportunity, and rationalisation were usually significant. This pattern suggests that the six factors overlap and that adding capability, arrogance, and collusion absorbs variance that would otherwise be attributed to the triangle factors. Small samples, often fewer than 150 students, amplify this instability.

The second explanation is context. Pressure and opportunity matter most in online and AI-assisted settings, where supervision is weak and tools are readily available, whereas capability and collusion stand out in conventional settings, where cheating requires skills and accomplices. The third is measurement. Most studies measure intentions or perceptions through self-reported questionnaires, which are vulnerable to social desirability bias, especially for sensitive constructs such as rationalisation and arrogance. The fourth is the influence of moderators. Religiosity and spirituality weakened the effects of pressure and opportunity in some studies (Sholikhah et al., 2024; Sososutiksno et al., 2023), but not in others (Affandi et al., 2022), and institutional policies had limited and uneven effects (Bierstaker et al., 2024; Janinovic et al., 2024). The fifth is timing. Many studies were conducted during the pandemic, when online learning altered the structure of opportunity and pressure, and only a few were conducted after the release of ChatGPT.

Quality and Reporting of the Evidence

Several features of the evidence base limit the strength of the conclusions that can be drawn. Most included studies rely on single-institution convenience or purposive samples, and the smallest analysed only 30 students (Juliardi et al., 2021). Measures of the hexagon factors differ from study to study, so the same label may refer to different constructs. Arrogance, for example, is sometimes measured as overconfidence and sometimes as disregard for rules. Few studies validate their instruments across institutions or test measurement invariance between groups. The dependent variable is usually a self-reported intention or perception rather than observed behaviour, and only one study compared actual

examination settings (Bierstaker et al., 2024). Qualitative studies provide valuable insight into how students justify their behaviour (Sallaberry et al., 2023; Yovanka & Sugiarti, 2024), but they remain rare. Finally, AI-specific studies are few and mostly cross-sectional, so they cannot show how students' use of AI evolves as tools, policies, and norms change.

Table 5. Research Agenda Derived from the Review

Theme	Evidence gap	Suggested research direction
AI-assisted fraud	Few studies specific to ChatGPT and generative AI	Develop and validate scales for AI-assisted academic fraud; distinguish legitimate AI assistance from misuse
Model specification	Overlapping factors and unstable results in full hexagon models	Test discriminant validity among factors; compare nested triangle, diamond, pentagon, and hexagon models
Measurement	Self-reported intentions and social desirability bias	Use indirect questioning, scenario experiments, and behavioural or administrative data
Context	Mixed conventional, online, and AI settings	Conduct multi-group analyses by learning mode and assessment type; compare pre- and post-ChatGPT cohorts
Moderators	Inconsistent role of religiosity, spirituality, and policy	Test moderators such as ethical climate, AI policy clarity, and assessment design across institutions
Sampling	Small single-institution samples	Use multi-institution samples, including the accounting programmes in Surabaya, and longitudinal designs

Source: Authors' synthesis of the 27 included studies

Theoretical and Practical Implications

Theoretically, the review suggests that the fraud hexagon remains a useful framework for academic fraud but that its factors are neither equally important nor independent. The triangle factors capture the core motivational and situational drivers, particularly in online and AI-assisted settings, while capability and collusion add explanatory value in conventional settings and in complex forms of misconduct. Arrogance contributes little once capability is accounted for. Generative AI does not render the hexagon obsolete; rather, it shifts the balance among its factors by increasing opportunity, lowering the capability threshold, and supplying ready-made rationalisations. Future theoretical work should model these interactions explicitly rather than treat the six factors as independent predictors.

Practically, the findings point to several priorities for universities and accounting programmes. First, assessment should be redesigned to reduce opportunity, for example through in-class or oral components, process-based assignments, personalised case questions, and tasks that require students to critique or document their use of AI (Cotton et al., 2024; Sullivan et al., 2023). Second, institutions should publish clear policies that distinguish acceptable from unacceptable AI use, because ambiguity fuels rationalisation (Perkins, 2023). Third, educators should address pressure by managing workloads and deadlines and by providing support for students facing stressful circumstances (Ferguson et al., 2023). Fourth, group assignments should be designed with individual accountability to prevent collusion. Fifth, accounting ethics education should explicitly link academic integrity with the professional values of integrity and objectivity in the code of ethics for accountants (Ikatan Akuntan Indonesia, 2021), emphasising that habits formed in university carry over into professional practice (Association of Certified Fraud Examiners Indonesia Chapter, 2020). Finally, because capability is a consistent driver, programmes should teach students to use AI transparently and responsibly, turning a potential instrument of fraud into a tool for learning (Kasneci et al., 2023).

Implications for Indonesian Accounting Programmes

The findings are particularly relevant to accounting programmes in Indonesia, where most of the included studies were conducted. Large cities such as Surabaya host many universities with accounting programmes, and students move within shared networks of peers, study groups, and social media channels through which answers, prompts, and AI outputs can circulate quickly. In such environments, collusion and rationalisation may spread across institutions, so integrity initiatives are more effective when they are coordinated, for example, through shared guidelines among accounting departments or professional associations. Programmes can integrate AI literacy into existing courses, such as accounting information systems, auditing, and professional ethics, so that students learn how to use AI to analyse data, draft documentation, and check calculations while acknowledging its use and verifying

its outputs. Assessment of accounting competencies can place greater weight on reasoning, interpretation, and professional judgement, which are harder to outsource to AI, and less weight on routine answers that AI can generate easily. Finally, the planned empirical study of accounting students in Surabaya can help institutions in the region by providing local evidence on which hexagon factors are most influential, enabling more targeted interventions.

Limitations

This review has several limitations. First, because of access constraints, the database search relied on Crossref and on five search strings, so studies indexed only in Scopus, Web of Science, or national databases may have been missed. Citation tracking reduced this risk by adding six studies, but some relevant work may still be absent, particularly very recent AI studies. Second, screening and coding were based on titles, abstracts, and bibliographic metadata, so effects reported only in full texts may not have been captured, and effects with unspecified directions limit the precision of the vote counts. Third, vote counting does not account for effect sizes or study quality. Fourth, the review covers only 2020–2024 and journal articles, excluding grey literature and earlier foundational work on fraud theory.

CONCLUSION

This systematic review synthesised 27 empirical studies published between 2020 and 2024 on the fraud hexagon factors as drivers of students' academic fraud, including fraud in online learning and the misuse of ChatGPT and other generative AI tools. The evidence base is growing rapidly but remains dominated by small, single-institution surveys of Indonesian accounting students. Pressure, opportunity, and rationalisation are the most frequently supported drivers, particularly in online and AI-assisted settings, where workload, grade pressure, easy access, and the framing of AI as a harmless tool are recurring themes. Capability and collusion are the most consistent of the newer hexagon factors when all six are modelled together, whereas arrogance is rarely significant. Technology and AI misuse increasingly act as a distinct factor that reshapes the others.

The inconsistent findings in the literature can be traced to overlapping factors in full hexagon models, differences between conventional, online, and AI-assisted contexts, reliance on self-reported intentions, the uneven role of moderators such as religiosity and institutional policy, and the timing of data collection. Future studies, including the planned study of accounting students in Surabaya, should develop validated measures of AI-assisted academic fraud, compare nested fraud models, and use multi-institution and behavioural data. For educators, the message is that protecting academic integrity in the era of ChatGPT requires redesigning assessment, clarifying AI policies, addressing student pressure, and cultivating the ethical commitment expected of future accountants.

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Abbreviations

ACFE (Association of Certified Fraud Examiners), AI (Artificial Intelligence), DOI (Digital Object Identifier), IAI (Ikatan Akuntan Indonesia, Institute of Indonesia Chartered Accountants), IT (Information Technology), MLR (Multiple Linear Regression), MRA (Moderated Regression Analysis), PLS-SEM (Partial Least Squares Structural Equation Modelling), PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), S.C.C.O.R.E. (Stimulus, Capability, Collusion, Opportunity, Rationalisation, Ego).

Author Contributions

TAW conceptualised the review topic from the original research proposal, conducted the search and screening, extracted the data, and prepared the initial draft. SYP supervised the review, contributed to the discussion of educational implications, and revised the manuscript. All authors have read and approved the final manuscript.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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Availability of Data and Materials

The list of screened records, the coding sheet, and the search strings are available from the corresponding author upon reasonable request.

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