

Combating Digital Academic Dishonesty: A Scoping Review of Approaches



Dominic Afuro Egbe, Bethel Murimo Mutanga, Tarirai Chani

Abstract: *E-learning platforms are continuously evolving as a necessary support tool both for e-learning and blended learning in institutions of higher learning. Leveraging on the advancement of the Internet in the last decade, the proliferation of technologically enhanced teaching and learning tools present enormous benefits. Nevertheless, this massive digitization of education is also associated with the challenge of digital misconduct, which has become widespread amongst students, and now threatens academic integrity for blended and unsupervised e-assessments. Consequently, research on mitigating both traditional and digital academic dishonesty is gaining increasing attention in the last two decades. This increase in the volume of research as well as the huge threat that academic dishonesty poses to academic integrity makes it imperative to have a comprehensive and precise understanding of the current mitigating approaches and their corresponding results to guide future research. In an attempt to fill this gap, we conducted a scoping review to 1) determine the amount, focus, and nature of research on students' digital academic dishonesty; 2) summarize results of current approaches to mitigate academic dishonesty; and 3) articulate a future research direction. Therefore, in this paper, we contribute to the existing body of knowledge by presenting a scoped summary of scholarly studies on academic dishonesty. The results show that the plague of academic dishonesty is both persisted and growing and that a virtue approach is a potent approach in mitigating this threat to academic integrity. As a future research direction, we leveraged on these findings, to propose the ethno-ethics paradigm, which advocates the integration of cultural beliefs into the process of building and enduring culture of academic integrity. Most importantly, our findings are crucial for guiding education policy direction and in shaping the service rendering options of e-learning service providers.*

Keywords: Academic Dishonesty, E-Learning, Ethno-Ethics, Honor Code, Digital Dishonesty.

I. INTRODUCTION

E-learning uses computing technologies to deliver diverse digital learning resources to students and learners at any time, anywhere [1]. With this digital method of learning, learners tend to enjoy more leverage when compared to what is usually obtainable in the traditional pen-and-paper or classroom-based learning scenario [2]. Fundamentally, e-learning involves delivering, marking, and analyzing

students' assessments with the help of computer tools [3]. And being technologically driven, it offers many leverages toward students' learning like flexibility [2], cost efficiency [4], and convenience [5], facilitate fast feedback, increase objectivity, reduce marking effort, and promote autonomous evaluation [6], among others. Generally, e-learning supports two forms of assessments: supervised e-assessment and unsupervised e-assessment. While supervised e-assessment takes place in a designated supervised environment, the unsupervised form allows students to complete online assessments from any location and at their convenient time without any supervision [7]. Owing to these enormous benefits, the majority of educational institutions have adopted e-learning in recent years. More so, as the emerging mobile cloud computing technology becomes the dominant driver of these digital learning platforms, there has been an explosive growth of commercial and open-source e-learning platforms, which are also being adopted across educational disciplines [8], [9]. Apart from this phenomenal trend of e-learning increasingly becoming an essential component of higher education as a non-traditional instructional method [10], e-learning also has a staggering market worth. For example, in 2016, the e-learning market was valued at \$247 million in India, with a capacity of 1.6 million users. Moreover, this market value is projected to reach \$1.96 billion by 2021. Also, the US, the global e-learning market leader has been forecasted to see its market base like MOOCs, Coursera, Udemy, etc. exceed \$48 billion by the end of 2020 [11]. And no doubt, with the Covid-19 pandemic set to establish social distancing as the new normal for global social interaction, there will be an increased reliance on e-learning platforms by institutions of higher learning for the delivery of their educational services. Nevertheless, as e-learning keeps growing in popularity, there have been great concerns in the literature that the corresponding rise of cheating behaviours amongst e-learning users is a serious threat to e-assessment in general, and to unsupervised e-assessment in particular [12], [13]. In fact, the authors in [14] reported that a staggering proportion (95%) of its one hundred and ninety-six (196) surveyed undergraduate students admitted that they had cheated at least once during unsupervised e-assessment. Moreover, findings from Harmon and Lambrinos (2008) indicate that unsupervised e-assessments has a significantly low R-squared statistic (8%) compared to supervised e-assessments (49.7%), and according to these authors, R-squared statistic scores are inversely proportional to cheating levels. While these findings specifically stand to underscore the fact that the credibility of unsupervised e-assessment is under threat, they also by extension strongly question the academic integrity of e-learning in general [16], [17].

Revised Manuscript Received on July 10, 2020.

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Research efforts to address these challenges have increased in the last decade and span diverse approaches that are characterized by investigations that focused on evaluating the impact of different variables on students' academic dishonesty [18]–[20]. Despite the significant increase in research on the mitigation of students' academic dishonesty, and their corresponding findings, the knowledge of summarized literature on this subject is seemingly lacking or scanty in the current literature.

The broad implications of this gap can be overwhelming. First, the findings on potentially effective mitigating approaches may not be known to education policymakers for possible implementation. As such, the threat posed by academic dishonesty to both academic qualifications and institutional integrity may continue to grow. Second, without a comprehensive and precise understanding of the current mitigating approaches and their corresponding results, it becomes difficult for researchers to leverage the existing knowledge to develop better solutions.

On the other hand, as the transition from the conventional learning method to virtual methods grows in dominance, having such knowledge has the potential to not only provide clarity on existing findings but is equally be helpful to inform future research that may be intended to tailor existing approaches toward the emerging virtual learning space.

Therefore, this paper is an attempt to organize, and summarize literature related to the subject of mitigating students' academic dishonesty to identify the key conceptual underpinnings, the mitigation approach, and the available evidence, and then use the findings as the basis to anticipate a possible future research direction. This aim aligns with the objectives of the scoping review methodology [21], [22], which essentially involves formulating a mechanism to describe the scope of research activity in the subject of our interest then summarize and disseminate research results.

II. THE REVIEW METHODOLOGY

Based on the goal of this paper, as highlighted in the background section, the scoping review method was considered because it gives a suitable framework to realize the goal of this study. Therefore, in this section, we gave an overview of a coping review and presented steps adopted in this review.

Methodologically, a scoping review is closely similar to a systematic review [21], [23] in that both require rigor in their screening process and transparency in the methods for collecting, analyzing, and interpreting data. Such a requirement is used to judge the reliability of results as well as to strengthen the potential for reproducibility. However, while the core emphasis of systematic reviews is on quality assessments [24], the key focus of scoping reviews is on the research findings themselves [22], which are then analyzed and organized in a manner to form an extension of the existing body of knowledge.

Our methodological approach was structured into four main phases, following the protocol developed by Tricco et al [25] which is based on the scoping review methodological framework. In phase one we searched for relevant studies and the inclusion criteria formulated for this study were then used in phase two to select studies. Data extraction data from the selected articles in phase three, while collating, summarizing, and reporting of the results was done in phase four. As it is

fundamental to scoping reviews, these stages were performed iteratively to ensure the adequate coverage of literature by flexibly moving from one stage to another, as well as repeating steps whenever it was necessary [24].

III. ELIGIBILITY CRITERIA

Due to its interdisciplinary nature, the literature on academic dishonesty, in general, is broad in dimension, and the behaviours that constitute digital academic dishonesty in specific have been diversely classified because of the evolving Internet age and the plurality of institutional policies, which create a scenario without a universal ethical framework.

Taking the above diversity into consideration, our inclusion criteria draws from a combination of definitions in the literature that comprehensively and precisely scope the topic of academic and digital academic dishonesty. Three definitions were adopted to guide our inclusion criteria by providing clarity on the concept of, intension for, and categorization of academic dishonesty. To understand the core concept of academic dishonesty, we used William Kibler's [26] definition of academic dishonesty as "forms of cheating and plagiarism that involve students giving or receiving unauthorized assistance in an academic exercise or receiving credit for work that is not their own". On motivation, Anderman et al [27] state that "academic cheating involves some kind of illicit means to be successful in an academic task", while Witherspoon et al [28] provided a comprehensive categorization of academic dishonesty.

Based on the clarity provided by these definitions, we included the following types of papers: 1) studies assessing students' perception of academic dishonesty, 2) studies assessing students' attitudes toward academic dishonesty, 3) studies that used quasi-experiments in assessing the impact of various variables on students' academic cheating behaviours, and 4) comparative studies assessing students' perceptions and responses to various institutional approaches to mitigate academic dishonesty.

IV. SEARCH STRATEGY

We conducted comprehensive literature searches with the research team by first developing a list of relevant keywords that were then used to search two major academic search engines, name, Google Scholar, and Microsoft Academic, which are primarily meant for searching only scholarly content. Moreover, Google Scholar particularly is like a superset of Scopus and Web of Science, the most extensive academic databases, as it can return about 89% and 93% of Scopus and Web of Science citations respectively [29]. Due to time and the large volume of identified papers, we focused on only quantitative research studies that are reported in the English language from 2000 to 2019. And to further constrain our search queries to return only relevant papers, we enclosed keywords in double-quotes and used the Boolean operator "AND" to join the quoted keywords to form phrases.

V. SELECTION OF STUDIES

The search results of all identified studies were treated as a screening sample from where the final sample consisting of only studies that meet our research objectives. In meeting this requirement, selected articles had to fulfill our inclusion criteria: 1) investigated students' digital or traditional academic dishonesty, 2) English language publication, 3) published not later than the year 2000, and 4) is quantitative research. Furthermore, to ensure reliability, two reviewers screened the article titles from the screening sample based on the set criteria.

This enabled us to access the suitability of the articles and then mark it as "include", "exclude" or "maybe". However, whenever an articles' title and abstract alone do not provide enough information to enable the review to decide, the full article was retrieved and read to gather more information from other sections.

VI. DATA EXTRACTION PROCESS

For all the included articles, we designed a suitable template that facilitated the coding of the extract data on each study's characteristics that describe each article. For instance, to report the amount of research in this field we extracted the publication year of each article while data regarding the investigated dependent and independent variables were extracted to facilitate the description of the research focus of studies. We also extracted data regarding the research methods, as well as the analysis and reporting tools utilized in each reviewed study. This data enabled us to gain insight into

the nature of the researches. And statements that indicated the original research results were also extracted to form qualitative metasummaries, which have been in [30] as "vital end products of research integration studies that report their findings in the form of a qualitative survey".

VII. RESULTS

As illustrated in Figure 1, the literature search generated a total of 1497 articles. Of this number, 1021 were retrieved from Google Scholar and 476 from Microsoft Academic. Following the selection process as outlined in section IV we performed two rounds of screening. During the first round, 1467 articles were excluded for various reasons including not being quantitative researches, 18 articles considered for further review as a decision could not be reached based on the topic and abstract, and 53 articles were included in the final article sample as potentially relevant for review. In the second round of screening, we carried out a full-text review of the 18 articles that were considered for further review. Out of this number, and the remaining 7 articles were added to the final sample while 14 articles were excluded because they focused on the aspect of students' dishonesty that has to do with illegal downloading and digital piracy, and not specifically on academic dishonesty. Therefore, in total, 19 articles were included for the final review, and 1478 articles were excluded.

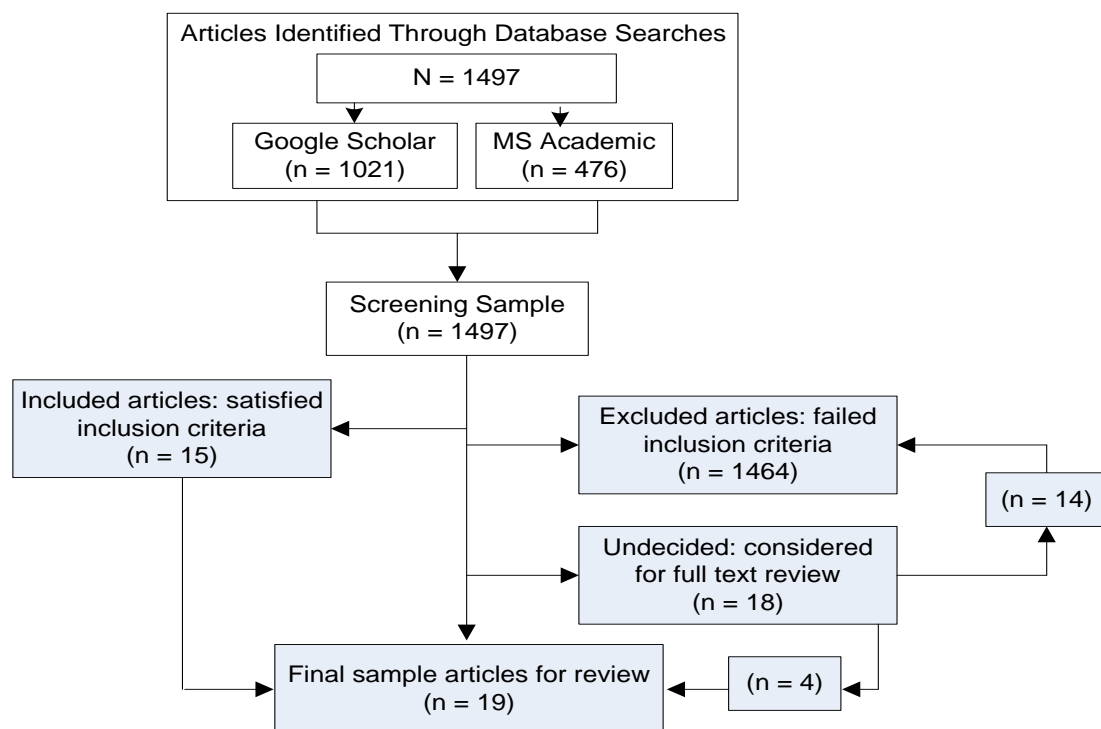


Figure 1: Study flow - flow diagram describing the process of searching and selecting relevant studies for review

Table 1: Article characterization

Year of publication	No of publications	% of publication in two years	Country
2000 - 2001	0	0	-

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2002 - 2003	1	5.26	-
2004 - 2005	0	0	Not specified
2006 - 2007	2	10.5	USx2
2008 - 2009	3	15.8	USx2, Canada
2010 - 2011	2	10,5	USx2
2012 - 2013	6	31.6	USx5, Philippines
2014 - 2015	3	15.8	US, India and Australia
2016 - 2017	1	5.3	Thailand
2018 - 2019	1	5.3	Kenya

VIII. CHARACTERIZATION OF THE REVIEW ARTICLES

As indicated in Table 1, the 19 articles included for review were published between 2002 and 2019, with the highest number of articles, constituting 32% published between 2012 and 2013. In terms of the frequency publication within two years, we observed that the highest frequency publication of 86% occurred between 2006 and 2015. By geographical

location based on continents, the spread of the revealed articles shows that over 67% (13 out of 18) of the studies took place in the Americas (Canada and the United States), about 17% (3 out of 18) studies conducted in Asia, only one study in Africa.

Table 2: Summarized results

Variables	Prevalence of digital misconduct (behaviour)	Attitude towards digital misconduct	Intention to engage in digital misconduct	Motivation to engage in digital misconduct
Gender, age	1, 2	1, 6		
Institutional code of ethics and policies	4, 16	3, 18	2, 13	
Subjective norms (from peers and family)	1, 0	0, 1	4, 5	0, 1
Beliefs (religious and others)		4, 8	0, 7	
Attitude and emotions	0, 3		1, 12	
Perceived benefits, cost and consequences	0, 1	2, 3	0, 6	1, 1
Internet usage time		1, 1		
Misconduct history	0, 3		0, 3	
Institution size e-assessment type (supervised vs unsupervised)	0, 4			
Students' Academic Performance	0, 1			
Facilitating conditions			1, 0	

IX. SUMMARY OF RESULTS

In general, the articles in the review sample do not make explicit their theoretical framing. This discovery was in contrast with what seemed to be a norm followed by almost 80% of the 14 articles that were considered for full-text review but later discarded because they focused on other forms of digital dishonesty but not on academic dishonesty [31]–[33]. On this discovery, we inferred that the seemingly less emphasis on the theoretical framing may be because the

authors were more concerned with providing practical solutions to academic dishonesty than with reporting the theoretical correctness of their findings. Nevertheless, two out of the 19 articles were based on three theoretical frameworks, namely, the Social Learning Theory, the Theory of Planned Behaviour, and the Deterrent Theory [34], [35]. Concerning the methodological approach, the studies either used surveys

(traditional or online-based), mixed-method, or the quasi-experimental approach (posttest or pretest/posttest) and analyzed data using descriptive statistics. Of the 19 articles, only 1 used the mixed-method approach [36], 8 studies [18]–[20], [34], [37]–[40] followed a quasi-experimental approach, and the other 10 studies adopted survey questionnaires [41]–[50].

X. SUMMARY OF RESULTS

In Table 2, we present eleven categories of independent and dependent variables that were extracted from the reviewed articles as the main factors that influence students' digital misconduct. On the table, we list the independent variables on the columns and dependent variables on the rows.

Essentially, our findings are centered on the approaches taken in these studies to mitigate students' academic dishonesty both in the conventional and virtual environments.

Altogether, we extracted 141 findings on the relationship between each identified category of factor and a given dependent variable as represented on Table 1 as a two-number pair [a, b]; where "a" represents the number of reviewed findings on the non-existence of a correlation between the factor and the dependent variable being considered and "b" the existence of a correlation between the factor and the dependent variable in question.

From our findings as demonstrated in Table 1, we can group the approaches adopted in the literature to mitigate academic dishonesty into two major categories:

A. The Determinant Factors Evaluation Approach

Essentially, studies under this category outlined the various factors which may affect the rate of students' cheating or their perceptions of cheating, focusing on individual, situational, and deterrent factors. Although all the other studies also attempted to measure the rate of academic dishonesty, as well as students' perception toward academic dishonesty, only two of the studies adopted a passive approach [47], [49]. That is, the authors did not attempt to directly or indirectly influence students' overall ethical orientation, rather, they only designed instruments that enabled them to gather and analyze data to gain insight into the determinant factors of academic dishonesty. For example, the role of mindset, learning environment, and the motivation to study, were investigated in [49] while the authors in [47] reported on how gender, time spent on the Internet, and institutional type and size impacts students' academic cheating.

In the context of the general findings as shown in Table 1, religious and other beliefs, students' attitudes and emotions, and the perceived benefit or consequences were the factors reported to have the most significant mitigating impact on students' digital academic dishonesty. For example, 19 (13%) of the 141 findings indicated that students' beliefs have a significant impact on both their attitude towards academic dishonesty and their intention to engage in digital misconduct. Interestingly too, 16 (making 11%) of the total findings showed that the prevalence of academic misconduct and the intention to engage in it are predominantly influenced by students' attitudes and emotions. This claim is evident in the fact that 15 out of the 16 findings indicated a positive correlation.

B. The Virtue Approach

Beyond identifying the potential determinant factors of academic dishonesty, 89% (17 out of 19) of the studies took a rather proactive approach that primarily seeks to mitigate students' academic dishonesty by improving students' overall ethical orientation [18], [19], [43]–[47], [50], [51], [35]–[42]. Fundamentally, studies that adopted the virtue approach designed various real-life experimental scenarios that were aimed at using ethics orientation to influence students' character against academic dishonesty. Such an approach aligns with the school of thought that asserts that "learners are taught ethics they will make more ethical decisions after learning moral principles governing what is right or wrong" [52], [53]. In the end, findings from these studies were used as the basis to drive the advocacy to incorporate ethics into the academic curriculum, especially in e-learning as a potent mechanism for mitigating academic dishonesty [54], [55]. Within the virtue approach school of thought, two subcategories of studies were reported in the literature, namely, the modified honor code or code of ethics as in [42], [35], and [39] and the traditional investigated in the other 16 studies. In the overall, as depicted in Table 1, 56 (38%) of the 141 findings demonstrated the potential of mitigating students' academic dishonesty using the virtue approach. The implication is that this proactive approach is gaining significant research attention in the last 2 decades. Moreover, 84% (47) of these 56 findings indicate that the presence of an institutional code of ethics strongly influences the prevalence of digital misconduct, students' attitude towards academic misconduct, and their intention to engage in academic misconduct.

XI. DISCUSSION AND THE OPPORTUNITY FOR FUTURE RESEARCH

We acknowledge the several limitations to this scoping review. For instance, our review sample has only 16 articles on students' academic dishonesty, meaning we had to decide which results to summarize, which has the potential to impede a thorough assessment of such a diverse field. Also, because of time and cost constraints, only English language publications were considered in our review. However, such restriction implies that the validity of these results has limited scope too. Despite these limitations, the insight offered by our review results still provides a good background to draw conclusions that can be generalized within the context of the constrained scope of this study. Therefore, we can submit as follows: 1) The topic of academic dishonesty is still under growing scrutiny by researchers and education policymakers. This observation suggests that the plague of academic dishonesty is not only persisting but evolving. 2) Generally, the use of an institutional code of ethics or honor code has proven to be an effective mitigating mechanism for academic dishonesty through what is called the virtue approach. Notwithstanding, because the findings supporting this claim are predominantly from studies that were conducted in the United States, it becomes a call for a more global investigation of the overall effectiveness of the approach. 3) And that the research innovation in the field as characterized by the effort to evolve the traditional honor code by creating modified

versions not only offers the prospect for a more effective mitigating mechanism but also invites investigations into the possibility of creating more contextualized or tailored honor codes. Most importantly, following these conclusions, we see a research gap that can be explored toward addressing the growing digital academic dishonesty which is associated with the current explosive drive toward virtual learning. This research gap was inspired by the virtue approach in the review literature. The virtue approach was widely adopted and shown in the reviewed literature to be an effective mechanism to mitigating academic dishonesty. However, we argue that one of the most dominant trends in the 21st century is that learning environments are globalized – a situation where institutions of higher learning are increasingly becoming culturally and demographically diverse. This diversity, to a large extent, defines students' moral values and determines how much they can be influenced by an institutional code of ethics. As such, we envisage the need to further modify existing honor codes or conventional honor codes by giving them an ethnographic perspective. This contextualized modification would create what we refer to as an ethno-ethics honor code. Then the mitigating impact of ethno-ethics on digital academic dishonesty can be investigated using the most promising approach as revealed in the findings of this review. In the context of this study, therefore, ethno-ethics refers to a code of ethics that reflects the set of moral principles rooted in diverse cultures as demonstrated in the shared beliefs and values that are implicit in the languages, practices, etc. of such cultures [56]. And for continents such as Africa, among others, with a vast cultural heritage, the ethno-ethics paradigm would constitute a strong framework to facilitate the integration of cultural beliefs into the process of building and enduring culture of academic integrity.

XII. CONCLUSION

Generally, the literature trend in this field indicates that the challenge of students' academic dishonesty is persistently growing alongside the ubiquity. Motivated by this trend, this scoping review of research on digital academic dishonesty identified two major approaches employed in the literature to address the challenge of students' academic cheating. On the findings, we have identified and mapped key dependent variables to their respective independent variables of academic dishonesty as presented in the various studies. We also provided a clear picture of the effectiveness of existing mitigation approaches in the current literature. Furthermore, we revealed the current innovative drive toward designing more potent mechanisms for mitigating academic dishonesty. Specifically, we took note of the transitional research effort in the current literature to evolve the traditional honor code into the modified honor code, from where we gained the insight to articulate a possible further direction in the fight against digital academic dishonesty. Such direction, we argue, entails leveraging on the effectiveness of the virtue approach to design and test the mitigating impact ethno-ethics.

REFERENCES

1. L.-N. Martín, M. J. Fernández-Iglesias, J. González-Tato, and F. A. Mikic-Fonte, "Blended e-assessment: Migrating classical exams to the digital world," *Comput. Educ.*, vol. 62, pp. 72–87, Mar. 2013.
2. N. Brouwer, A. Heck, and G. Smit, "Proctoring to improve teaching practice," *MSOR Connect.*, vol. 15, no. 2, p. 25, Jan. 2017.
3. R. Cerezo, A. Bogarin, M. Esteban, and C. Romero, "Process mining for self-regulated learning assessment in e-learning," *J. Comput. High. Educ.*, vol. 32, no. 1, pp. 74–88, Apr. 2020.
4. V. Chang, "Review and discussion: E-learning for academia and industry," *Int. J. Inf. Manage.*, vol. 36, no. 3, pp. 476–485, Jun. 2016.
5. A. El Mhouthi, M. Erradi, and A. Nasseh, "Using cloud computing services in e-learning process: Benefits and challenges," *Educ. Inf. Technol.*, vol. 23, no. 2, pp. 893–909, Mar. 2018.
6. K. A. Maguire, "Computer-based Testing: a Comparison of Computer-based and Paper-and-pencil Assessment," *Acad. Educ. Leadersh. J.*, vol. 14, no. 4, 2010.
7. R. K. Ladyshewsky, "Post-graduate student performance in 'supervised in-class' vs. 'unsupervised online' multiple choice tests: implications for cheating and test security," *Assess. Eval. High. Educ.*, vol. 40, no. 7, pp. 883–897, Oct. 2015.
8. K. Raman, N. Othman, and G. Danaraj, "Investigating Key Factors for Successful E-learning Implementation," *Asia Proc. Soc. Sci.*, vol. 4, no. 2, pp. 49–52, Apr. 2019.
9. Q. N. Naveed and N. Ahmad, "Critical Success Factors (CSFs) for Cloud-based E-Learning," *Int. J. Emerg. Technol. Learn.*, vol. 14, no. 01, pp. 140–149, Jan. 2019.
10. A. Sushkova, A. Bilyalova, D. Khairullina, and C. Ziganshina, "E-Learning Efficiency: Linguistic Subject Taught via Electronic Educational Resources," in *Advances in Intelligent Systems and Computing*, 2020, vol. 1114 AISC, pp. 197–206.
11. H. Agarwal, "Impact and Effectiveness of E-learning on Students," in *GKA EDU 2020 Congreso Internacional de Educación y Aprendizaje*, 2020.
12. D. J. Prince, R. A. Fulton, and T. W. Garsombke, "Comparisons Of Proctored Versus Non-Proctored Testing Strategies In Graduate Distance Education Curriculum," *J. Coll. Teach. Learn.*, vol. 6, no. 7, pp. 51–62, 2009.
13. R. Ronny, *Strengthening the trust in online courses: a common sense approach*, vol. 28, no. 5. Consortium for Computing Sciences in Colleges, 2013.
14. M. Gaskill, "Cheating in Online Learning: Exploring Students' Motivation, Practices and Possible Solutions with Mixed Methods Research Data Collection," in *Society for Information Technology & Teacher Education International Conference*, 2014, pp. 446–452.
15. O. R. Harmon and J. Lambrinos, "Are Online Exams an Invitation to Cheat?," *J. Econ. Educ.*, vol. 39, no. 2, pp. 116–125, Apr. 2008.
16. H. Mellar, P.-F. Roumiana, S. Kocdar, and A. Karadeniz, "Addressing cheating in e-assessment using student authentication and authorship checking systems: teachers' perspectives," *Int. J. Educ. Integr.*, vol. 14, no. 1, 2018.
17. A. Fask, F. Englander, and Z. Wang, "Do Online Exams Facilitate Cheating? An Experiment Designed to Separate Possible Cheating from the Effect of the Online Test Taking Environment," *J. Acad. Ethics*, vol. 12, no. 2, pp. 101–112, 2014.
18. J. J. Ely, L. Henderson, and Y. Wachsmann, "Testing the Effectiveness of the University Honor Code," *Acad. Educ. Leadersh. J.*, vol. 17, no. 4, pp. 95–104, 2013.
19. L. Morgan and L. Hart, "Promoting Academic Integrity in an Online RN-BSN Program," *Nurs. Educ. Perspect.*, vol. 34, no. 4, pp. 240–243, 2013.
20. H. Corrigan-Gibbs, N. Gupta, C. Northcutt, E. Cutrell, and W. Thies, "Deterring Cheating in Online Environments," *ACM Trans. Comput. Interact.*, vol. 22, no. 6, pp. 1–23, Sep. 2015.
21. M. J. Grant and A. Booth, "A typology of reviews: An analysis of 14 review types and associated methodologies," *Health Information and Libraries Journal*, vol. 26, no. 2, pp. 91–108, Jun-2009.
22. L. C. Weeks and T. Strudsholm, "A scoping review of research on complementary and alternative medicine (CAM) and the mass media: Looking back, moving forward," *BMC Complementary and Alternative Medicine*, vol. 8, pp. 1–9, 19-Jul-2008.
23. C. Okoli and K. Schabram, "A Guide to Conducting a Systematic Literature Review of Information Systems Research," *SSRN Electron. J.*, vol. 10, no. 2010, pp. 10–26, 2012.
24. H. Arksey and L. O'Malley, "Scoping studies: Towards a methodological framework," *Int. J. Soc. Res. Methodol. Theory Pract.*, vol. 8, no. 1, pp. 19–32, Feb. 2005.
25. A. C. Tricco *et al.*, "A scoping review on the conduct and reporting of scoping reviews," *BMC Med. Res. Methodol.*, vol. 16, no. 1, pp. 1–10, 2016.

1. L.-N. Martín, M. J. Fernández-Iglesias, J. González-Tato, and F. A. Mikic-Fonte, "Blended e-assessment: Migrating classical exams to the digital world," *Comput. Educ.*, vol. 62, pp. 72–87, Mar. 2013.
2. N. Brouwer, A. Heck, and G. Smit, "Proctoring to improve teaching

26. W. L. Kibler, "Academic Dishonesty: A Student Development Dilemma," *NASPA J.*, vol. 30, no. 4, pp. 252–267, 1993.
27. E. Anderman, P. Cupp, and D. Lane, "Impulsivity and Academic Cheating," *J. Exp. Educ.*, vol. 78, no. 1, pp. 135–150, Sep. 2009.
28. M. Witherspoon, N. Maldonado, and C. H. Lacey, "Undergraduates and Academic Dishonesty," *Int. J. Bus. Soc. Sci.*, vol. 3, no. 1, pp. 76–86, 2012.
29. ELSE, "Google Scholar, Web of Science, and Scopus: Which is best for me?," 2019. [Online]. Available: <https://blogs.lse.ac.uk/impactofsocialsciences/2019/12/03/google-scholar-web-of-science-and-scopus-which-is-best-for-me/>. [Accessed: 27-Jun-2020].
30. L. Grootel, L. Balachandran Nair, I. Klugkist, and F. Wesel, "Quantitizing findings from qualitative studies for integration in mixed methods reviewing," *Res. Synth. Methods*, vol. 11, no. 3, pp. 413–425, May 2020.
31. K. Robertson, L. McNeill, J. Green, and C. Roberts, "Illegal Downloading, Ethical Concern, and Illegal Behavior," *J. Bus. Ethics*, vol. 108, no. 2, pp. 215–227, Jun. 2012.
32. H. Aleassa, J. M. Pearson, and S. McClurg, "Investigating Software Piracy in Jordan: An Extension of the Theory of Reasoned Action," *J. Bus. Ethics*, vol. 98, no. 4, pp. 663–676, Feb. 2011.
33. I. Phau and J. Liang, "Downloading digital video games: predictors, moderators and consequences," *Mark. Intell. Plan.*, vol. 30, no. 7, pp. 740–756, Oct. 2012.
34. J. O'Rourke, J. Barnes, A. Deaton, K. Fulks, K. Ryan, and D. A. Rettinger, "Imitation Is the Sincerest Form of Cheating: The Influence of Direct Knowledge and Attitudes on Academic Dishonesty," *Ethics Behav.*, vol. 20, no. 1, pp. 47–64, Jan. 2010.
35. D. L. McCabe, L. K. Treviño, and K. D. Butterfield, "Honor codes and other contextual influences on academic integrity: A replication and extension to modified honor code settings," *Res. High. Educ.*, vol. 43, no. 3, pp. 357–378, 2002.
36. N. Martinov-Bennie and R. Mladenovic, "Investigation of the Impact of an Ethical Framework and an Integrated Ethics Education on Accounting Students' Ethical Sensitivity and Judgment," *J. Bus. Ethics*, vol. 127, no. 1, pp. 189–203, Dec. 2015.
37. F. LoSchiavo and M. Shartz, "The Impact of an Honor Code on Cheating in Online Courses," *J. Online Learn. Teach.*, vol. 7, no. 2, 2011.
38. H. Corrigan-Gibbs, N. Gupta, C. Northcutt, E. Cutrell, and W. Thies, "Measuring and Maximizing the Effectiveness of Honor Codes in Online Courses," in *Proceedings of the Second ACM Conference on Learning @ Scale - L@S '15*, 2015, pp. 223–228.
39. M. Roig and A. Marks, "Attitudes toward cheating before and after the implementation of a modified honor code: A case study," *Ethics Behav.*, vol. 16, no. 2, pp. 163–171, 2006.
40. J. N. Engler, J. D. Landau, and M. Epstein, "Keeping up with the Joneses: Students' Perceptions of Academically Dishonest Behavior," *Teach. Psychol.*, vol. 35, no. 2, pp. 99–102, 2008.
41. H. M. O'Neill and C. A. Pfeiffer, "The Impact of Honour Codes and Perceptions of Cheating on Academic Cheating Behaviours, Especially for MBA Bound Undergraduates," *J. Account. Educ.*, vol. 21, no. 3, pp. 231–245, Jun. 2012.
42. B. M. Schwartz, H. E. Tatum, and M. C. Hageman, "College Students' Perceptions of and Responses to Cheating at Traditional, Modified, and Non-Honor System Institutions," *Ethics Behav.*, vol. 23, no. 6, pp. 463–476, Nov. 2013.
43. K.-K. L. Yasmine, M. A. Stellmack, and M. L. Shilkey, "Comparison of Honor Code and Non-Honor Code Classrooms at a Non-Honor Code University," *J. Coll. Character*, vol. 9, no. 3, 2008.
44. P. Resurreccion, "Impact of faculty, peers and integrity culture in the academe on academic misconduct among Filipino students: An empirical study based on social cognitive theory," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 2, no. 12, pp. 33–50, 2012.
45. R. Arnold, B. N. Martin, and L. Bigby, "Is There a Relationship Between Honor Codes and Academic Dishonesty?," *J. Coll. Character*, vol. 8, no. 2, Feb. 2007.
46. R. A. R. Gurung, T. M. Wilhelm, and T. Filz, "Optimizing Honor Codes for Online Exam Administration Optimizing Honor Codes for Online Exam Administration," *Ethics Behav.*, vol. 22, no. 2, pp. 158–162, 2012.
47. K. K. Molnar and M. G. Kletke, "Does the Type of Cheating Influence Undergraduate Students' Perceptions of Cheating?," *J. Acad. Ethics*, vol. 10, no. 3, pp. 201–212, Sep. 2012.
48. D. L. McCabe, L. K. Treviño, and K. D. Butterfield, "Honor Codes and Other Contextual Influences on Academic Integrity: A Replication and Extension to Modified Honor Code Settings," *Res. High. Educ.*, vol. 43, no. 3, pp. 357–378, 2002.
49. D. Thomas, "Factors That Explain Academic Dishonesty Among University Students in Thailand," *Ethics Behav.*, vol. 27, no. 2, pp. 140–154, 2017.
50. M. R. Catacutan, "Attitudes toward cheating among business students at a private Kenyan university," *J. Int. Educ. Bus.*, 2019.
51. N. Mazar, O. Amir, and D. Ariely, "The Dishonesty of Honest People: A Theory of Self-Concept Maintenance," *J. Mark. Res.*, vol. 45, no. 6, pp. 633–644, Dec. 2008.
52. C. L. L. Lau, "A Step Forward: Ethics Education Matters!," *J. Bus. Ethics*, vol. 92, no. 4, pp. 565–584, Apr. 2010.
53. D. R. May, M. T. Luth, and C. E. Schwoerer, "The Influence of Business Ethics Education on Moral Efficacy, Moral Meaningfulness, and Moral Courage: A Quasi-experimental Study," *J. Bus. Ethics*, vol. 124, no. 1, pp. 67–80, Sep. 2014.
54. L. M. Hinman, "Academic integrity and the World Wide Web," *ACM SIGCAS Comput. Soc.*, vol. 32, no. 1, pp. 33–42, 2002.
55. E. Toprak, B. Özkanal, S. Aydin, and S. Kaya, "Ethics in E-Learning," *Turkish Online J. Educ. Technol.*, vol. 9, no. 2, 2010.
56. C. T. Andoh, "Bioethics and the Challenges to Its Growth in Africa," *Open J. Philos.*, vol. 01, no. 02, pp. 67–75, Nov. 2011.

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