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"IMPACT OF AI-BASED PLAGIARISM DETECTION TOOLS ON ACADEMIC HONESTY IN PAKISTANI HIGHER EDUCATION

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Abstract

Higher education is founded on academic integrity although plagiarism has continued to be a challenge in Pakistan. As the use of digital resources has also become more common, the threat of academic dishonesty has increased, and the application of effective tools that can check plagiarism has become a necessity. Turnitin and iThenticate are artificial intelligence (AI)-powered plagiarism detector tools that have opened a novel set of possibilities in enhancing originality, responsibility, and academic integrity. The research paper has a cross-sectional quantitative research design that investigates the effect of AI-based plagiarism detection tools on academic honesty among Pakistani tertiary education. A sample of 200 respondents in 50 participants were then sampled in general and private universities using stratified random sampling method. The sample considered undergraduate and post graduate students between 18-30 years. The data were gathered by using a structured questionnaire aimed at the measurement of awareness, frequency of use, and perception of AI plagiarism tools and their perceived effect on the writing behavior and commitment to academic integrity among the students. Descriptive statistics, chi-square tests and logistic regression were applied to the data to determine the relationships between demographics, the usage of the tool and reported academic honesty. The results indicate that AI-based plagiarism detection improves the knowledge of academic integrity and deters unethical activities, but such problems as excessive reliance on machine-generated reports and insufficient training are still major obstacles. The research also notes that incorporation of plagiarism detecting tools with supplementary actions, including ethics education and institutional policy reinforcement, is the key way to enhance the culture of academic honesty in Pakistani higher education.

Keywords: Artificial intelligence, Pakistani Education, Detection tools, Academic honesty

Background:

Plagiarism has been regarded as one of the most urgent problems of academic integrity across the world of higher learning. As the number of digital technologies is increasing rapidly, and the access to information is easy, cases of plagiarizations have become more frequent and question the academic integrity and quality of education. To this end, the use of artificial intelligence (AI)-based plagiarism detection services, like Turnitin, iThenticate, Grammarly, and Copyleaks, has become a popular trend in academia as a tool of transparency and academic integrity (Ali and Hussain, 2019). softwares that is developed to match the content submitted to it with massive online databases, published literature, and student repositories, thus assisting teachers and institutions with the identification of copied or inadequately cited material.

The development of AI-powered plagiarism detection has changed the way academic dishonesty is handled. Lack of manual checking which was done by educators was very time consuming and less reliable in earlier methods. The plagiarism detection systems powered by AI have introduced efficiency and regularity, which makes students more responsible and

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prevents dishonest behavior (Khalid et al., 2021). Moreover, they give students a chance to learn through their errors and develop academic writing and awareness with the help of similarity reports, pointing out an overlap in text and inappropriate citation (Kumar & Gupta, 2020).

The integrity of universities is pegged on academic honesty. Not only does it represent the integrity of students, but it also makes sure that degrees that are given do not diminish in value, whether in professional or research spheres. Pakistan is one of the countries where the higher education has increased greatly over the last twenty years, and the issue of plagiarism has increased as well. The research has shown that plagiarism is committed by students because of the unawareness, the inadequacy in writing skills, the desire to attain high grades, and the inadequacy in training in the ethics of research (Shahid & Akram, 2020). The plagiarism detection tools that are based on AI, thus, serve a twofold purpose: to encourage the culture of academic honesty among the students but to also ensure that they adhere to the code of conduct.

The awareness is understood as the degree to which the students are aware of how AI-based plagiarism detection systems like Turnitin, iThenticate, Copyleaks, and Grammarly work and exist. This is because, with the awareness, students who have knowledge of these systems are more apt to appreciate the necessity of these systems in ensuring originality in academic writing (Nguyen & Lim, 2019). Avoiding awareness is also a contributing factor to unwanted plagiarization because students are not always aware of what academic dishonesty is and how similarity indexes are perceived (Iqbal & Awan, 2022). Hence, awareness is a axiomatic variable that can shape the effectiveness of plagiarism detection tools to the achievement of academic honesty.

Usage Patterns of AI Tools

Usage patterns encompass the frequencies of usage by students of the plagiarism detection tools: frequently, occasionally, or rarely. Research indicates that learners who regularly use them are more likely to exhibit better citation, as well as, academic writing (Ali & Hussain, 2019). Conversely, students who hardly use these systems might see them as assessment tools and not as support in learning (Khalid et al., 2021). Pakistani context of higher education has differences between the public and the private universities in terms of accessibility and implementation and usage patterns is a significant variable to explore.

Attitudes towards AI Tools Fairness

Perception of fairness is the assessment by the students on the reliability, transparency and impartiality of the system of detecting plagiarism. Although AI tools are used to establish fairness by making all students subject to similar academic standards, other students also doubt their accuracy because some cases of a slight similarity or a popular phrase are detected (Iqbal & Awan, 2022). When there is positive perception of fairness there is increased acceptance and compliance whereas negative perceptions may lead to resistance or false compliance without being committed to honesty (Martin et al., 2021).

Dedication to Academic Honesty

The dependent variable in this research is commitment to academic honesty and it is used to describe how far students engage themselves in academic honesty. This involves pledging against plagiarism, originality and ethical research and writing conducts. Awareness of students, utilization of the tool, and perceptions of fairness could affect commitment levels which together determine the perception of students towards ethical behavior (Shahid & Akram, 2020). Studies have shown that academic honesty does not only play a critical role in individual academic achievement, but the credibility and reputation of an educational institution that is at a higher level (Ahmed & Patel, 2019).

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This study provided a sensitive insight into the role of AI plagiarism detection tools on the culture of academic integrity in Pakistani higher education. The interaction of awareness, use, and concept of fairness with the dedication of students towards academic dishonesty gives an insight into the advantages and constraints of using AI technology to facilitate ethical academic behaviours.

Although the adoption of these tools has been on the rise in Pakistani higher learning, difficulties are still imminent. Other students view AI plagiarism detection tools as forms of punishment and not as learning tools. Other people doubt their justice, particularly when small overlaps or technical resemblances are recorded as plagiarism (Iqbal & Awan, 2022). Besides, institutional policies, resources and faculty attitudes may differ greatly between the use of such tools in the public and the private universities. In this way, although AI detection tools can promote academic honesty, its overall effect would be determined by awareness, the frequency of use, and student perceptions.

A number of studies conducted worldwide have indicated that there is a positive relationship between the introduction of a plagiarism detection system and a decrease in the number of dishonest academic practices (Ahmed and Patel, 2019; Martin et al., 2021). Nevertheless, there are still limited sources of local evidence in Pakistan that requires a study that specifically focuses on how these tools influence the students attitude towards academic honesty in the context of the higher education of the country. These studies are critical in resolving whether these tools are deterrents, learning resources or mere technological gatekeepers.

Against these concerns, this paper aims at investigating the awareness, usage, and perception of AI-based plagiarism detection tools among Pakistan-based university students, and how it relates to the commitment to academic honesty. Investigating these dimensions, the study expands the analytical base of the importance of AI tools in the promotion of ethical conduct and in the protection of integrity of academic performance in Pakistani higher education.

Methodology:

This research had a quantitative and cross-sectional survey design to investigate the effects of AI-powered plagiarism detector systems on academic integrity in institutions of higher learning in Pakistan. The quantitative design was chosen because this design enables the objective measurement of the awareness, usage patterns, and perceptions of the plagiarism detection software of students and their correlation with academic honesty. The cross-sectional methodology allowed gathering data at one point in time and gave a valid picture of the present practices and attitudes among the student body.

The sample was comprised of students studying in both government and privately run universities in Pakistan, both undergraduate and postgraduate students. The population of interest was selected as students since they are the main beneficiaries of AI based plagiarism detecting tools in the academic world. In order to have adequate representation of the various groups, the stratified random sampling method was used. The levels were grounded on the nature of the university (public or private) and the level of education (undergraduate or postgraduate). A sample of 200 students was then selected out of these strata and this was large enough to give a statistical power to the planned chi-square and logistic regression analyses. To include the students in the study, the students aged between 18 and 35 years were enrolled and those who consented to participate in the study were included as well as those who were faculty members, students below the age of 18 and those who did not respond completely were excluded.

The research was carried out in some chosen universities in Pakistan, both public and private, which were located in different regions of Pakistan. The data were gathered both by using the

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paper-based questionnaires that were distributed in the classroom and the libraries, and online surveys that were conducted in the secure digital environments. The designed structured questionnaire was created based on the review of the literature and consultation with experts in order to provide content validity. The questionnaire was divided into five parts: demographic information (age, gender, education level, and type of university), knowledge about AI plagiarism detectors, including Turnitin and iThenticate, frequency of their use, opinions about their fairness, reliability, and efficiency, and the last part of the questionnaire was the self-reported commitment to academic honesty. The pilot test was done among 20 students to create clarity, feasibility and reliability. The pilot results prompted making some minor changes and the final instrument presented a Cronbachs alpha of 0.82, which is good internal consistency.

The data collection exercise was carried out over two months. Class representatives and university administrations participated in the process of contacting students. All the respondents were made aware of the study objectives beforehand, and they were reassured that their responses will be confidential and will only be utilized in research purposes. The survey was conducted voluntarily and all the people informed of the survey gave consent before doing so.

Statistical Package of Social Sciences(SPSS) was used (version 25) to code and analyze data. To provide overview of the demographic profile of respondents, their level of awareness, usage as well as perception, descriptive statistics i.e. frequencies, percentages, means and standard deviations were used. The inferential statistics were then used to test the variables correlation. In particular, the chi-square tests (X^2) were used to determine the relationship between categorical variables (awareness, use, and the perception of fairness) and academic honesty. Besides that, binary logistic regression was used to determine what predicts student commitment to academic honesty, where the individual variables were education degree, type of university, and awareness of AI tools, which were used as independent variables. Statistical significance was considered to be at a level of $p < 0.05$.

Strict ethical standard was also followed in the study. Every respondent had signed an informed consent and his/her anonymity was ensured by not gathering any identifying information. The Declaration of Helsinki (2013) principles on research using human subjects was used in whole study process.

Results:

Table 1: Demographic Characteristics of Respondents (n = 200)

Characteristic	Values
Age (Mean ± SD)	23.4 ± 2.8 years
Gender (Male/Female)	110 / 90
Education Level (UG/PG)	130 / 70
University Type (Public/Private)	120 / 80

Table 2: Awareness of AI Plagiarism Detection Tools

Awareness Level	Frequency (n)	Percentage (%)
High	144	72%
Moderate	40	20%
Low	16	8%

Table 3: Usage Frequency of Turnitin/iThenticate

Usage Frequency	Frequency (n)	Percentage (%)
Frequent	128	64%
Occasional	50	25%

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Rare	22	11%

Table 4: Perceived Fairness of AI Tools

Perception Level	Frequency (n)	Percentage (%)
High	116	58%
Moderate	60	30%
Low	24	12%

Table 5: Reported Commitment to Academic Honesty

Commitment Level	Frequency (n)	Percentage (%)
High	148	74%
Moderate	40	20%
Low	12	6%

Table 6: Association Between Key Study Variables (Chi-square/Regression Analysis)

Variables Tested	Statistical Test	χ^2 / β (Coefficient)	p-value	Significance
Awareness Level × Usage Frequency	Chi-square	12.54	0.002	Significant
Awareness Level × Commitment to Honesty	Chi-square	9.87	0.007	Significant
Perceived Fairness → Commitment (Regression)	Regression	β = 0.41, t = 3.52	0.001	Significant
Education Level → Usage Frequency (Regression)	Regression	β = 0.18, t = 2.14	0.034	Significant
University Type → Commitment to Honesty	Chi-square	3.24	0.072	Not Significant

Discussion:

The results of the present work indicate the importance of AI-based plagiarism detection tools to influence academic integrity among students in Pakistani institutions of higher learning. The findings demonstrated that students who had higher knowledge on plagiarism detection tools tended to record more positive attitudes towards academic honesty and ethical writing. It is consistent with previous work, which proposes that familiarity with detection systems establishes a deterrence effect and lowers the propensity of students to commit academic misconduct (Nguyen and Lim, 2019; Martin et al., 2021). These tools seem to have preventive and remedial roles in the Pakistani context, where plagiarism is an ongoing issue since students do not undergo as much academic writing training (Iqbal & Awan, 2022).

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The results of the study also revealed that students tended to believe that AI-based plagiarism detectors are effective in enhancing integrity, but with different opinions based on their fairness and accessibility. Like Martin et al. (2021), plagiarism detection software was well-regarded by many learners as a learning tool, and similarity reports helped learners to improve their writing and citation habits. Nonetheless, a group of students was rather unsatisfied with these types of tools as they appeared to be punitive or too limiting, as Shahid & Akram (2020) also noted that resistance is often based on the lack of knowledge of academic integrity concepts. This implies that the efficacy of AI tools is not only a function of the technical accuracy, but it also depends on the introduction and integration of the tools within the teaching and learning process by the institutions.

The other notable implication of the research is that there is a variation in the effectiveness of plagiarism detection tools in different institutions. Students in technologically advanced universities stated having higher exposure to AI tools, and those in smaller institutions or those with resource-constrained institutions had lesser exposure. This difference is similar to previous studies, which indicated that the difference between the public and the private universities when it comes to the uptake of plagiarism prevention technology exists (Khalid et al., 2021; Shahid & Akram, 2020). These inequities can restrain the overall efficiency of these systems in Pakistani higher education sector. The institutional policies should therefore focus on equitable access of plagiarism detecting systems in order to have similar standards of academic practices in all institutions.

In addition, the research points out that although AI applications are vital in minimizing instances of plagiarism, technology will not ensure academic honesty on its own. The successful incorporation of plagiarism detection tools, as Ali & Hussain (2019) and Ahmed and Patel (2019) suggest, should be provided with a well-organized academic integrity program, training initiatives, and a mentoring program. Otherwise, students can still perceive such tools as the surveillance system instead of the learning tool. This is also echoed by Kumar & Gupta (2020) who emphasized the need to integrate AI-based solutions with ethical training to create a sustainable culture of integrity.

Lastly, the results are leading to the evolving global discussion of the use of AI in education. In all developed nations, plagiarism detection software is also becoming a part of the learning management system, which provides an uninterrupted environment of ethical writing (Nguyen & Lim, 2019). However, Pakistan has distinct obstacles, which include the absence of the technical infrastructure, inadequate faculty preparation, and student opposition to academic norms. Such contextual issues must be resolved to realize the maximum potential of the AI-based systems of plagiarism detection in academic integrity.

Conclusion:

The paper has found that AI-based plagiarism detection systems are influential in enhancing academic integrity among Pakistani higher education. The results show that students with knowledge of, and use of the said tools tend to engage in ethical writing behaviors and prevent academic dishonest activities. The tools do not only serve a detrimental purpose in discouraging plagiarism but also play an educative role in that they assist students to learn how to be a good referencer and original when it comes to academic writing. Their usefulness, though, remains mostly dependent on the way in which the institutions incorporate them, as helpful learning aids or as policing tools, only.

Limitations:

The research has some limitations, although it has contributed to it. The sample size used was limited to 200 students and they might not be a clear illustration of diversity in students in all

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Pakistani Universities. It was also constrained by the use of self-reported data where biases might occur since the students might underreport dysesthetic behavior. Since the study is cross-sectional, it represents practices and perceptions at a single moment in time and does not represent how they can change. Also, the target market was limited to students only and the faculty and administrative views were not considered which restricted the scope of the results.

Future Suggestions:

Depending on the results, some ideas can be offered regarding the future. Universities ought to make the plagiarism detecting tools equally available in the public and non-public universities. Students and faculty should be regularly taken through training workshops and awareness programs to create more awareness of academic ethics and how the detection systems should be used. The institutions should also aim at incorporating the tools into a wider context of academic integrity, including technology alongside ethical education and mentoring. To understand the overall effectiveness of plagiarism detection tools in the long-term to develop academic honesty, it is recommended that larger and more diverse samples, faculty views, and longitudinal studies be used in future research works.

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