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Academic Cheating And Plagiarism: Detection And Prevention Using Technology

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Abstract: Due to the development of modern technology, academic cheating, and plagiarism have become a serious issue in the education systems of almost all countries. Students can easily access information from the internet and using it without acknowledging the source and harming the reputation of academic institutions. AI tool is promoting high tech plagiarism violating the established rules and regulation governing academic dishonesty. Cheating could be the result of cooperation between student, teacher and administrators; therefore universities should initiate major changes in the examination management process. Cheating and plagiarism shifts the focus of teachers and students away from learning behaviour so the secure hosting of exams, automatically identifying cheating in assessments, and preventive measures like punishment and supervision should be ensured. In this article, the role of technology in the detection and prevention of cheating and plagiarism is highlighted.

Index term: Higher education, Cheating, Plagiarism, Artificial intelligence, Technology.

I. INTRODUCTION

As digital technologies continue to shape higher education and research strategies, the robust digital security measures will safeguard the academic integrity. The educational landscape is now upholding a commitment to fairness, transparency, and excellence ultimately supporting the aspirations of students and enhancing the integrity of the nation's educational system. The advancements in data analytics and predictive modeling are optimizing exam logistics and resource allocation, ensuring smoother administration, and reducing operational challenges. Large and prestigious examination bodies are looking for solutions that can help their exams be secure, transparent, and efficient. One of the biggest challenges with these high-stakes exams is that they are vulnerable to risks and fraud.

It has been noticed that 80-90% students are cheating in university examination. Therefore, there is urgent need of further modification our education system [1]. Students are using tools and resources like citation generators, citation checkers, free plagiarism checkers, AI proofreaders, paraphrasing tools, grammar checkers, summarise, AI detectors, proofreading tools, etc. for their academic work. Increased pressure on student from family or workplace to obtain qualification or degree, potential expectations of family, poor academic integrity awareness, unethical application of AI tools, insufficient time, and heavy workload with numerous assignments are contributing factors to cheating and plagiarism.

II. OFFLINE EXAMINATION MANAGEMENT SYSTEM

The present offline examination procedure contains a lot of manual work starting right from registering students, creating roll sheets, making a table, setting question papers, making seating arrangements, assessing answers papers, and preparing marks sheets. The manual work is often time consuming, less accurate and requires a lot of human effort. Digital technology can automate the whole process and store data on a central platform providing seamless access to everyone involved. The final assessment is based on an internal assessment conducted by the respective colleges and university departments, through periodic tests, quizzes etc. End-semester examinations are typically conducted by the universities. Different universities have different patterns of internal and external evaluation. Each university has a unique examination system process which they have shaped based on university ordinances, constraints, distinctive characteristics, resources available, etc. It is necessary to ensure the digital locks are fully functional before examination to ensure timely opening of examination booklets and timely distribution of question papers.The printed question papers should be packed properly and dispatch them to respective examination centers. Improper packaging may pose a great threat to the examination process in universities. Delays in receiving sealed packets by the respective examination centers may lead to serious concerns and anxieties among the personnel involved. Result declaration directly affects student's future careers, especially for final-year results. Due to the leakage of papers, the exams are cancelled. This adversely affects the students in many ways like increased stress, anxiety, loss of time and money, etc. Further due to delays in exams, students pursuing higher studies or jobs or other career opportunities may be adversely affected. Printing errors or errors due to insufficient proofreading are also one of the biggest issues faced by universities. It has been noticed that the paper setters/proofreaders/staff of setting paper leak the paper for commercial benefits. The printing and packaging the question papers, the question papers pass through various hands, therefore proper supervision and confidentiality need to be maintained. In a manual system, a lot of expenditure occurs in printing the examination forms and keeping the records.Trained invigilators or proctors are present in the examination hall to ensure fairness, security, and integrity of the examination and prevent any form of cheating. There is increasing interest in e-assessment/exams where the candidate sits on a computer and types their answer using the keyboard rather than writing with a pen. Offline exam software helps institutions without any reliable internet connection instead of relying on paper-based processes.

III. ONLINE EXAMINATION MANAGEMENT SYSTEM

It is time for colleges to opt for an automated examination management system. It will help them to keep pace with the rapid changes in the education system. It will also save time, effort, and hassles. For online examinations, implementing cutting-edge encryption techniques and multifactor authentication can protect against unauthorized access. Blockchain technology tracks and secures examination papers from creation to evaluation, confirming any tempering will be immediately detectable. The selection of an appropriate platform is crucial in the changing field of online education, examination, and assessment. This platform ensures the accuracy and dependability of assessments; and includes strong anti-cheating safeguards, user-friendly interfaces, and real-time monitoring capabilities. In an automated system, just after examination, the marks of each student are immediately sent to a centralized database of the educational institution for appropriate storage. The institution can print the marks or display them for easy and quick access. Technology has made it possible to automate the grading process, reducing the workloads for teachers and improving the speed and accuracy of grading. The successful adoption of computer-based examinations, on-screen marking, and just-in-time question paper management are the next big transformations that will be witnessed in India's education system.

IV. ACADEMIC CHEATING IN EXAMINATION

Online exams are susceptible to cheating and candidates can use creative ways to cheat during examinations. Academic cheating takes place when a candidate attempts to attain academic credit through unfair means. Student can use smartphones to access notes, answers, and communicate with other individuals for cheating. Smart phones are capable of storing a lot of information like formulas and equations that enable students to

cheat during exams. More advanced calculators are easily programmable; therefore, simple calculators may be allowed in some exams. Some private groups have been created by students on various Apps for the exchange of notes. Screen-sharing tools are used to get answers from another person. Virtual machine can be used as an additional operating system to look up the test questions and answers while proctoring software watches the primary operating system. Sometimes candidates request another person to take the exam on their behalf by modifying their identification papers. Candidates can use fake driver's licenses or college identification cards, which may be difficult to confirm virtually even when a proctor is watching via webcam. Authentication and verification are done before the test begins, so it is impossible to prevent this kind of dishonesty. Candidates can collaborate with other candidates during the exam by chatting. Some students might load audio files and cheat using headphones and earbuds during examinations. Students may hide wireless earbuds in different areas of the body. Keyloggers can be used to capture keystrokes which enable one to know the answers typed by the previous candidate. Candidates can use cheating websites that provide answers to exam questions.

V. PLAGIARISM IN ASSIGNMENT/PAPER SUBMISSION

Chat GPT (Chat Generative Pre-trained Transformer) is an AI tool that support to violate the examination fairness and raises concerns regarding academic cheating and plagiarism. It is specially designed to generate human-like text in a conventional style. This undermines the very purpose of higher education. ChatGPT can be used by the student to generate high-quality written assignments and may have an unfair advantage over other students. This could lead to inequalities in the assessment process [2]. Students can use chatbot applications for their answers that affect the student's true level of understanding. Reliance on AI can also lead to over-dependence on AI-generated content, diminishing their own creative and critical thinking skills. The Generative AI tools help students to rewrite a paper previously submitted raises ethical concerns about plagiarism and academic honesty. The AI detection software tool for detecting AI-generated content in university assessment is not sufficient and is difficult to prove the similarity of content [3]. Therefore, there is a need to raise awareness of these tools among academics.

Candidates can easily access information from online sources without the author's permission or citation. Students are using unauthorized materials during tests and submit other student assignments from previous semesters and claim them as their work. Fabrication, falsification, and misinterpretation of data and information are other forms of cheating and academic misconduct. The paraphrasing tool is a free AI-powered rewriter that uses National Language Processing (NLP) AI software to paraphrase the text that has been provided from another source. Paraphrasing tools simply restate the original text in different words and also offer more extensive vocabulary with a deeper understanding of the structure of the original work. Duplichecker allows paraphrasing a thousand words at a time and replacing 70-75% of words with their synonyms. Spin bot paraphrased tool can eliminate all instances of Plagiarism in text. Quilot, prepostseo, SEO Tolls Centre, paraphraser.io, spinner chief, spinbot, word tune, etc. are paraphrasing tools available. Paraphrasing means just rewriting someone's ideas into own words.

VI. MEASURES TO REDUCE CHEATING IN EXAMS

Proctoring software are used to monitor a candidate's computer activity, webcam, and microphone during the exam to ensure that they are not using unauthorized resources or getting assistance from others. The software is used to detect multiple logins from the same IP address and prohibit communication during the exam. AI-driven proctoring solutions will help the organization in filtering the perfect candidate for cheating during online recruitment.

Verification of Identity of candidates should be done by requesting identification documents, such as a passport or driver's license, and comparing them to the candidate's photo. Only identity/verification measures such as government-issued IDs or biometric authentication should be allowed. By establishing a code of conduct, online exam cheating can be significantly reduced, and the recruitment process can be made more transparent and fairer for all candidates. The use of AI and machine learning in grading not only speed up the process but also enhances its accuracy. Remote proctoring technologies are used to monitor students through video and audio, detecting suspicious movements and flagging potential cheating incidents. The secure browser technology locks down the testing environment on the student's device, preventing them to access to web

resources, unauthorized software, and messaging tools during the examination. Employing an AI-powered proctoring system can enhance the monitoring of examinations, reducing the chances of cheating. Biometric verification can ensure the security to the examination process. A digital question bank created on the cloud can be accessed anytime with the internet using unique username and password ensuring no chance of leakage. A small cell phone detection device is used to detect any nearby cell phone in the examination hall. Online exams must be conducted at online test centers so that they are monitored and have cheating restriction facilities. Online proctoring software can detect any device connected to the candidate's computer. Remote proctoring software often blocks most screen activities. The proctoring software can detect screen sharing and alert the exam supervisor. Software is used to detect virtual machines and prohibit their use. Identity verification measures such as facial recognition or biometric authentication are done to ensure that the person taking the examination is a registered candidate. Strict AI-driven anti-cheating protocols guarantee the integrity of the exam. Software is used to detect key loggers and prevent their installation. There should be provision for blocking /shutting down the cheating website during examination. The software that can detect access to known cheating websites and prohibit access to these websites should be used. The strong passwords and encryption algorithms should be used that is difficult to guess or break. Proctor U service provides online proctoring during examinations and helps in detecting and preventing cheating. Safe Assign is used to compare papers against other papers for overlapping and originality. Proctor back software uses AI to ensure that students cannot cheat. Students should complete all academic assignments independently and they will not be allowed to use any aids during exams. The CCTV cameras within the examination hall and metal detector outside the examination hall should be used to detect any devices.

VII. MEASURES TO REDUCE PLAGIARISM

Plagiarism detection software ensures that all submissions are original and authentic, crucial in maintaining academic integrity. Students are allowed to submit papers after going through plagiarism checker online programs such as turnitin.com. Students are allowed to submit papers after going through plagiarism checkers online programs such as Turnitin, Urkund, iThenticate, Drill Bit, Copyscape, Docos, Duplichecker, PlagScan, Unicheck, and Viperetc. The plagiarism system checks all documents against three central source areas such as the internet, published materials such as Journals, books, etc., and previously submitted students' materials (e.g. Memoranda case studies, and examination works)[4]. Universities must take the lead in ensuring that the rise in AI-generated content in academia does not compromise research quality or academic integrity. Many universities are using plagiarism detection software, Turnitin, and claimed as most effective software for detecting plagiarism. Candidate must acknowledge and cite source materials in papers and assignments. They should not copy another student's assignment, either in part or entirely, and present it as their work. They should not copy online assignments or answers from the internet. They should not use GenAI (like Chat GPT, or Grammarly) to generate content for submission as their own. However, when using someone else's exact word format them as a quote, paraphrase others' ideas in your own words, and avoid self-plagiarism by reusing any part of a previous paper.

VIII. GOVERNMENT INITIATIVES

Digital technology has changed the education scenario by enhancing teaching and learning, research and governance [5]. With the assistance of the government's changing educational paradigms, and technological breakthroughs, online examination systems in India have a bright future. The government has decided to rectify the issues about the integrity of competitive examinations. The allegations of paper leaks have raised serious doubts among students nationwide about the fairness and reliability of crucial exams. The Indian government has taken proactive steps to specify a long-term strategy for restoring trust and ensuring the integrity of the examination process to rebuild confidence and ensure fairness for all students.

(A) Jammer installation in exam centres

Jammers in examination centers should be installed to check the use of unfair means through radio frequency-based devices. The UGC has specified classroom jammer model EC-CRJ-6B5 that should be used to prevent radio equipment from receiving and transmitting signals. The Faraday Cage is also used to block

electromagnetic wave and it will not allow mobile phones for texting the questions and answers inside the examination hall.

(B) Public Examination Acts

The Govt. has introduced the Public Examination (Prevention of Unfair Means) Act 2024 to curb unfair practices and deter potential wrongdoers. The law came into force on June 21, 2024. This act imposes stringent penalties for leakage of question paper or answer keys directly or indirectly assisting the candidate in any manner in public examination and tempering with computer network. Any person under this act shall be punished with imprisonment not less than three years which may be extended to five years and with a fine up to Rs 10 lakh. A source provider engaged in the conduct of the examination shall be punished with the imposition of a fine up to Rs. one crore and imprisonment for up to 10 years when found guilty.

(C) Penalties for Plagiarism

In 2018, the UGC issued a notification entitled "Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions" and as per the decision of the Plagiarism Disciplinary Authority (PDA), the penalties for plagiarism for thesis and dissertation as well as academic and research publications are fixed at different level. For level 0 (up to 10% similarity) there will be no penalties for academic and research publication. For level 2 (above 10% to 40% similarity), the candidate will be asked to resubmit a revised script within a maximum period of six months or the author will be asked to withdraw their manuscript. For level 2(above 40% to 60% similarity).The student shall be debarred from resubmission of the revised script for one year. The faculty has to withdraw the manuscript and he will be denied the right to receive one annual increment along with a prohibition from supervising new Ph.D. students/scholars for two years. Level 3 (above 60% similarity), the student's registration for that program will be terminated. The faculty will be denied a right to two consecutive annual increments along with a prohibition from supervising new Ph.D. students/scholars for three years [6,7]. To identify plagiarised content and to prevent copyright infringement the UGC has introduced special software 'Drillbit' plagiarism detection software as a part of the "Shodh Suddhi" initiative under the INFLIBNET Project.

(D) Predatory Publications

To promote academic and research integrity as well as publication ethics, UGC has established the Consortium for Academic Research and Ethics (CARE) and released a list of approved journals in 2017. After Oct 2018, UGC removed 4000 predatory Journals. Predatory journals more or less publish any submitted papers by charging fees, without following the usual protocol of screening, refereeing, revising, and editing. However, high-quality open-access journals, also charge publication fees but maintain high standards for peer review and editing. Predatory journals are also able to fix Impact Factors through fake citations. The percentage of research articles published in predatory journals is high in our country may be due to overemphasis on quantity rather than quality of research publication. It indicates a potential compromise of academic integrity and publication ethics. Predatory journals are polluting electronic databases and contaminating all domains of research. The initiatives UGC-CARE will hopefully educate the academic community and warn them to stay away from such predators and choose journals for publication that follow standard ethical policies.

IX. DIGITAL EXAMINATION PLATFORM

Digital exam platforms provide accessibility from anywhere with an internet connection. This platform provides immediate grading and feedback. It includes features like secure browsers and remote proctoring. It offers data analytics to gain insights into exam performance and trends. Reliable and user-friendly digital platforms should be used that provide detailed instructions and guidelines to candidates. Candidates access the digital exam platform using their devices and complete the test within a specified time frame. The platform uses an automated grading system to evaluate responses and provide instant feedback, while security features ensure the integrity of the exam. Online examination Platform such as HireMees embraces the digital revolution in

Examination in the country. Examonline is an AI-based remote proctoring software that is extremely versatile and allows us to conduct cheating-free exams. MercerMettl proctoring allows conducting credible online exams globally. EasyLMS is well-developed online examination software supportive of all devices. Conduct Exam is an online examination software for creating online exams and online tests. UbiAptitude is an online testing software used to find the best applicant in no time and reduces bad hiring to a great extent. Eklavvya is an online assessment software that helps to prepare the environment and process to conduct an assessment of the candidate undergoing vocational training. Zyxware provides cloud cloud-based automated exam management system. Digiproctor facilitates universities to transform their entire examination process and workflows into digital mode. It also creates personal dashboards for each student where they can log in to view university notifications, view their test schedule and details, get their test keys, and view their results post-exam.

X. INFRASTRUCTURE CHALLENGES

The number of affiliated colleges and courses has increased manifold. Some of these colleges do not have adequate infrastructure and faculties. This sometimes leads to malpractices during examinations. There are not any exclusively dedicated examination halls to accommodate a large number of examinees with proper distance in between. There are also an insufficient number of teachers for invigilation duty. This has led to an increased workload in the examination division in universities. Insecure custody /storage facilities are prone to theft. Many colleges especially the nontechnical colleges in remote areas lack basic ICT infrastructure.

The lack of recognized faculties in the university and colleges affects the examination-related work like setting of question papers and moderation of question papers. There is a lack of an adequate number of trained permanent staff in the examination cell/ division. There is a huge shortage of qualified assistant professors in concerned courses for the assessment of papers. There is a need for technical staff including system analysts, data entry operators, and programmers in examination cells for implementation and maintenance of IT initiatives in the examination system in universities.

XI. TEACHERS AND ADMINISTRATORS ROLE

Teachers play a crucial role in preventing cheating and plagiarism by designing assignment and assessments question bank in varying format together with their solutions that require critical thinking and original thoughts. When cheating is done by students, teachers can no longer fairly access the student's work capability. Teachers should create clear and straightforward rules of conduct concerning academic integrity and enforce them at every stage of education. They should convey the message about the importance of academic honesty and the consequences of academic dishonesty behavior to students from the earliest stage of education. Teachers have the responsibility to discourage students from cheating. If the cheating reflects academic weakness or lack of confidence, then additional help to students should be provided.

XII. CONCLUSION

Today’s undergraduate and postgraduate students are the employees of tomorrow and the ethics they adopt will reflect in their behaviour in the future. Therefore, higher education institutions are required to introduce training programs and workshops to raise students’ awareness of the negative consequences of cheating and plagiarism, enhance their writing skills, and promote positive attitudes. With increased fairness, security transparency, and faster turnaround time, students will be the greatest beneficiaries of the introduction of digital technology.

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AUTHOR PROFILE

Dr. Shailaj Kumar Shrivastava holds a first-class Master's Degree (second topper) in Physics (advanced electronics) from Patna University. He has worked as a Research fellow at the National Physical Laboratory, New Delhi, and obtained his Ph.D. degree in Physical Science from Delhi University in 2002. His research interest is directed toward Material science, superconductivity, thin films, devices, and higher education. Having a distinguished teaching career over more than 27 years he has to his credit around more than seventy-five research papers published in leading journals and conferences. He participated in several national and international conferences and seminars and presented papers in the areas of superconductivity and issues related to higher education. Three Scholars have been awarded Ph.D degrees under his supervision. Besides being a member of several academic bodies of the university, he has more than 15 years of experience as a Principal in constituent colleges. Currently, he is the Principal at Kanhai Lal Sahu College, Nawada, Bihar (A constituent unit of Magadh University, Bodh Gaya). He has written a book entitled "Superconductivity: Materials and Applications". His academic profile is available on web search engines like Google Scholar, Orchid, Academia, and Vidwan. He got several awards including the 'Young Research Award' at IUMRS-ICA-98 held at IISc Bangalore. Despite the busy schedule of administrative responsibilities, Dr. Shrivastava is still active in his academic pursuit.

Mr. Chandan Shrivastava has B.Tech degree in computer science engineering from International Institute of Information Technology (IIIT), Hyderabad. Presently, he is working as an Applications Developer, at Oracle India Pvt Ltd, HITEC City, Hyderabad, Telangana, 500081, India. He has experience in various software development and application development internships at different organizations such as Oracle, Game Theory, ThinkSkill, Little Blocks, Cleverlogik Technologies, etc. He possesses skills in C, C++, Python, SQL, JavaScript, Dart, HTML/CSS, and GraphQL languages along with expertise in React JS, React Native, Node JS, Express JS, Flutter, and Redux frameworks. He is using developer tools like Git, Docker, Bash, Firebase, etc. His journey in software development has been a dynamic blend of learning, innovation, and impactful projects. He has completed various projects assigned to him individually and in groups. He published six research papers in reputed Journals. He got the 'Technology Innovation Award-2022' at the 22nd Global Leadership Summit-2022 at Goa (India) by Global Leaders Foundation, New Delhi.