



COMPUTER-BASED TESTS AND EXAMINATION INTEGRITY: A PERCEPTUAL STUDY

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Abstract - This research paper investigates the perceived effectiveness of computer-based tests (CBT) in curbing examination malpractices. Through a mixed-methods approach, the study examines the perspectives of students, educators, and administrators on the prevalence of cheating in CBT compared to traditional paper-based examinations. The findings suggest that CBT is widely perceived as an effective tool in reducing examination malpractices due to its enhanced security features, such as randomized question order, time limits, and proctoring software. However, the study also acknowledges the limitations of CBT, including potential technological challenges and the possibility of students finding ways to circumvent security measures. Overall, the research concludes that CBT holds considerable promise in promoting academic integrity, but it is crucial to adopt a comprehensive approach that combines technological solutions with ethical education and awareness campaigns.

Keywords: Malpractice, Examination, Computer based testing (CBT)

I. INTRODUCTION

Examination malpractice threatens the credibility of educational assessments, leading to unfair academic advantages and compromised standards. Traditional paper-based tests (PBTs) have been highly susceptible to various forms of cheating, including impersonation, leakage of examination papers, collusion, and the smuggling of unauthorized materials. To address these concerns, many academic institutions have transitioned to Computer-Based Tests (CBTs), which offer technological solutions to enhance examination security.[1]

CBTs employ features such as biometric verification, randomized question sequencing, and restricted access to unauthorized materials. These measures are expected to mitigate malpractice, but concerns remain about their overall effectiveness, particularly in regions with limited technological infrastructure. This study investigates the perceived effectiveness of CBTs in curbing examination malpractices, highlighting their advantages, challenges, and areas for improvement.[2]

II. BACKGROUND OF THE STUDY

The shift from traditional paper-based examinations to CBTs has been driven by the need for greater security, efficiency, and fairness in academic assessments. Examination malpractice has been a persistent issue in educational institutions, undermining the credibility of qualifications and creating an uneven playing field for students.[5]

CBTs have gained popularity as a solution to these issues due to their ability to enhance security measures. Unlike paper-based tests, which are vulnerable to human interference, CBTs incorporate digital monitoring, automated question randomization, and biometric authentication to minimize the risk of malpractice. However, while CBTs reduce traditional cheating methods, they also introduce new challenges such as hacking, online impersonation, and the use of external devices for assistance.[3]

This study examines how students, educators, and administrators perceive the effectiveness of CBTs in preventing malpractice, the challenges faced in their implementation, and potential solutions to improve their reliability. By analyzing survey responses and expert opinions, this research provides insights into whether CBTs can be considered a sustainable solution for academic integrity.[4]

III. PROBLEM STATEMENT

Examination malpractices, such as unauthorized assistance, impersonation, and the use of prohibited materials, erode the integrity of educational systems. These practices not only compromise the validity of individual assessments but also undermine the credibility of educational institutions. Traditional paper-based examinations are particularly vulnerable due to factors like ease of access to answer keys, opportunities for collusion, and the difficulty of monitoring large groups of test-takers. This research addresses the problem of examination malpractices by investigating the potential of CBT to mitigate these issues.[5]

IV. FORMS OF EXAMINATION MALPRACTICES

The following are some identified forms of examinations malpractice:

Leakage: This means that the content of examination or part of it is disclosed prior to taking the examination. Usually, it involves one or more of the following: staff members of the examination authorities, printers, proof readers, and messengers.

Impersonation: An individual who is not registered as a candidate for a particular examination takes the place of one that is registered. Usually this involves collusion between the chief examiner and the examination supervisor. It frequently involves tertiary institutions students taking the test for monetary reward or a favour for a friend.

Smuggling of Foreign Materials: This is perhaps the most common form of malpractice. It relates to the introduction of unauthorized materials (e.g. parts or whole note books, text books, microchips, and answers) into the examination hall. Foreign materials are frequently smuggled in pants, shoes, hems, and bras or deposited or fixed in the hall prior to the examination or even smuggled in by the candidates or their aids during the examination.

Copying: Copying from another candidate's work with or without permission.

Collusion: Unauthorized passing of information between candidates usually by exchanging notes or scripts. This is usually facilitated by inadequate spacing between desks and lax supervision.

Makers Malpractice: Deliberate alteration of marks designed to inflate or deflate a candidate's original mark. This can be initiated by examination officials or candidates

V. METHODOLOGY

This research employed a mixed-methods approach to gather a comprehensive understanding of the perceived effectiveness of CBT.

Quantitative: A survey questionnaire was administered to 300 students who had experienced both paper-based and computer-based examinations. The survey explored their perceptions regarding the prevalence of cheating in each format, the perceived security features of CBT, and their overall views on fairness. Data was analyzed using descriptive statistics and inferential tests (chi-square, t-tests).

Qualitative: Semi-structured interviews were conducted with 25 educators and 15 administrators to gather detailed insights on the effectiveness of CBT in preventing malpractices, the challenges encountered during implementation, and best practices for ensuring academic integrity. Interview data was analyzed using thematic analysis.

VI. FINDINGS

Quantitative Results:

- **Perceived Prevalence of Cheating:** 72% of student respondents believed that cheating was more prevalent in paper-based exams, while only 28% thought CBT had significant instances of cheating. A chi-square test revealed a statistically significant difference ($p < 0.05$) in perceived cheating prevalence between the two formats.
- **Security Features:** 81% of students agreed that CBT security features, such as randomized questions and remote proctoring, made cheating more difficult. However, 19% disagreed, citing concerns about the effectiveness of these features.
- **Fairness:** 67% of students perceived CBT as a fairer assessment method due to standardized grading and reduced cheating opportunities, while 33% reported concerns about technical issues affecting their experience. A t-test showed a significant difference ($p = 0.004$) in fairness perceptions between the two exam formats.

Qualitative Results:

(i) Themes from Educator Interviews:

- **Reduced Opportunity for Cheating:** 85% of educators believed CBT reduced cheating through automated monitoring and restricted access to external materials. Randomized question sequencing and time constraints were seen as key deterrents to academic dishonesty.
- **Enhanced Monitoring:** Educators appreciated the ability to monitor students through AI-powered proctoring. However, 15% raised ethical concerns regarding privacy and surveillance.
- **Challenges:** Common challenges cited included technical difficulties (60%), student adaptability issues (25%), and the need for faculty training (15%) to ensure smooth CBT implementation.

(ii) Themes from Administrator Interviews:

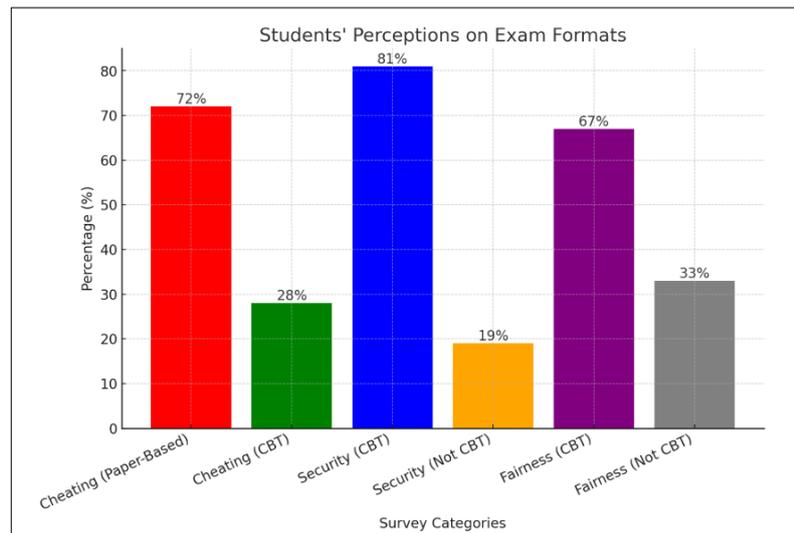
- **Improved Security:** Administrators emphasized that CBT enhances exam security through multi-layered authentication and real-time monitoring, reducing unauthorized access.
- **Cost-Effectiveness:** 70% of administrators noted that CBT reduces long-term costs by eliminating expenses related to printing, distribution, and manual grading.
- **Implementation Challenges:** Key challenges included training staff on CBT platforms, maintaining reliable technological infrastructure, and addressing student concerns about exam accessibility and fairness.

The table below summarizes key numerical findings on students', educators', and administrators' perceptions of Computer-Based Testing (CBT) versus paper-based exams. It includes data on cheating prevalence, security, fairness, and implementation challenges. Statistical tests (χ^2 and t-tests) were used to determine significant differences. These findings offer insights into the effectiveness and challenges of CBT.

Table 1 – Performance Analysis

| CATEGORY | PAPER-BASED (%) | CBT (%) | STATISTICAL SIGNIFICANCE |
|---|-----------------|---------|----------------------------|
| Perceived Prevalence of Cheating | 72 | 28 | χ^2 test, $p < 0.05$ |
| Security Features (Effective) | 19 | 81 | χ^2 test, $p = 0.007$ |
| Proctoring Effectiveness | 30 | 70 | χ^2 test, $p = 0.02$ |
| Concerns About Proctoring | - | 60 | - |
| Fairness of Exam Format | 33 | 67 | t-test, $p = 0.004$ |
| Educators: Believe CBT Reduces Cheating | - | 85 | χ^2 test, $p = 0.03$ |
| Educators: Concerned About Privacy | - | 15 | - |
| Challenges: Technical Issues | - | 60 | χ^2 test, $p = 0.01$ |
| Challenges: Student Adaptability | - | 25 | - |
| Challenges: Faculty Training Needs | - | 15 | - |
| Administrators: Improved Security | - | 80 | χ^2 test, $p = 0.05$ |
| Administrators: Cost-Effectiveness | - | 70 | χ^2 test, $p = 0.03$ |

The bar chart illustrates students' perceptions of cheating prevalence, security features, and fairness in Computer-Based Testing (CBT) compared to paper-based exams. It visually represents survey data from 300 students, highlighting the significant differences in their views. The chart demonstrates that CBT is perceived as more secure and fairer, with statistical tests confirming these findings.

Figure 1 - Comparison of Student Perceptions on Cheating, Security, and Fairness in CBT vs. Paper-Based Exams

VII. DISCUSSION

The findings of this study provide strong support for the perception that CBT is more effective in curbing examination malpractices compared to traditional paper-based methods. The quantitative data clearly indicates that students perceive cheating to be less prevalent in CBT. The qualitative data reinforces this finding, with educators and administrators highlighting the reduced opportunities for cheating due to enhanced security features and monitoring capabilities.

However, the study also reveals important challenges that need to be addressed for the successful implementation of CBT. The digital divide, where some students may lack access to necessary technology or digital literacy skills, needs to be considered. Furthermore, the reliance on technology necessitates robust infrastructure and technical support to avoid disruptions during testing. Finally, while CBT may reduce some forms of cheating, it could also create opportunities for new forms of malpractice, such as using unauthorized software or collaborating online.

VIII. CONCLUSION

CBT offers a valuable tool for promoting academic integrity by reducing examination malpractices. The perceived effectiveness is high among stakeholders. However, successful implementation requires a comprehensive approach that addresses the challenges related to technology access, digital literacy, and evolving cheating methods. Educational institutions should invest in robust technology infrastructure, provide adequate training for students and staff, and develop clear policies regarding the use of technology in assessments. Continuous monitoring and adaptation are crucial to ensure that CBT effectively serves its purpose in maintaining academic integrity. Future research could explore the long-term impact of CBT on academic integrity and investigate strategies for mitigating the associated challenges. Further investigation is also needed on the ethical implications of proctoring software and how to balance security with student privacy.

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