COMPUTER-BASED EXIT EXAMINATION IN ETHIOPIA: PROSPECTS, CHALLENGES AND STRATEGIES

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Abstract

The research encompasses the application of Computer-Based Exit Examinations (CBEE) at three Ethiopian public universities: Dilla University, Wolaita Sodo, and Hawassa University. It employs a qualitative case study method, which enables the investigation of the perceived opportunities, current challenges, and possible strategies for successful CBEE implementation. The data were collected through semi-structured interviews, focus groups, document analysis, and non-participant observations, involving final-year undergraduate program students, teachers, examination officials, university administrators, and Ministry of Education personnel. The findings reveal that CBEE can be one of the best means to make tests more effective and equitable. It provides the benefits of personalized testing environments, rapid score reporting, and alignment with international standards. However, a variety of challenges hold back the effective implementation of the program. The challenges include a lack of ICT infrastructure, students' low digital literacy, inefficient administrative practices, security issues, and accessibility and equity-related problems. It is recommended that overcoming such challenges will require tactics such as better cyber security, policy uniformity, infrastructure investment, educational orientation, and digital literacy initiatives. CBEE has the possibility to revolutionize and raise the standard of assessment practices in Ethiopian higher education if there is a well-coordinated national policy, vitally strong institutional support, and student-centered, inclusive implementation strategies, as per the findings of the study.

Keywords: Computer-Based Testing (CBT); Exit Examination; Higher Education; Digital Assessment and Educational policy.

Introduction

From early years through tertiary education, education sectors globally have coiled technology tightly in their different programs, and as a consequence, assessment has been greatly changed by computer-based testing (CBT), which has become a significant option alongside traditional paper-based testing (PBT). In response to global digital transformation trends, Ethiopia has also started to adapt and apply Computer-Based Exit Examinations (CBEE) in universities as well as in national leaving examinations of secondary schools, GAT, and most recently, public universities are undertaking final examinations through digital platforms. Curriculum-based exit exams are tests that help to ensure minimum competency standards of graduates before entering the labor market, thereby promoting educational quality (Bishop, 1998; El-Hassan et al., 2021; Teshome, 2025).

Applying CBT actually has a number of benefits, as it is indicated in different papers over paper-based testing: instant results availability, enhanced security, effective management, flexible scheduling, significant cost savings, and the potential to enhance accessibility through the use of multimedia, audio, and large print accommodations are some of these (Vrabal,2004).Additionally, CBT is used in most schools because it can be offered offline, online, or through networks (Frey & Hartig,2011). Computer-based examinations have become a logical step in the integration of technology into education because of the platform's previously noted advantages.

However, these benefits are accompanied by notable challenges. One of the main disadvantages is that schools lack the equipment and capacity to administer tests to every student at once (Randall et al., 2012; Thurlow et al., 2010). Challenges also include the

requirement to teach staff to give assessments accurately, a lack of school personnel to maintain equipment, technical issues with assessment software, and security risks (Davis, 2014;; Thurlow et al., 2010). Additionally, the comparability of scores across the two test delivery styles has raised concerns among assessment specialists, researchers, practitioners, and users (Wang et al., 2008).These concerns become more serious in the Ethiopian context, where material and human resource capacity remains limited compared to developed nations.

Research shows growing evidence that identical paper-based tests and computer-based tests do not always produce the same results due to "test mode effects" (Clariana & Wallace, 2002; Wang et al., 2008). Computer-related factors such as screen size, font size, graphics resolution, and navigation features can substantially change the nature of test tasks, meaning CBT and PBT may not measure the same constructs (McKee & Levinson, 1990). Therefore, student's familiarity and comfort with technology may significantly influence their performance, making CBT partly a measure of technological skills as well as academic ability (Backes & Cowan, 2019). Students need to be comfortable with digital tools to properly access assessments (Dadey et al., 2018), and those who regularly use testing devices in class tend to score higher (Davis et al., 2016), suggesting that technological exposure plays a crucial role in assessment outcomes.

The Ethiopian Ministry of Education (MoE) implements a variety of policy reforms to improve educational services in pre-primary, higher education, and adult and non-formal sub-sectors (MOE, 2008, 2010; MOSHE, 2020). As an instrument contributing to the efficiency of the educational and assessment process, CBEE has been implemented in all public and private universities, and the outcome of this examination is to enable such assessment to pave the way for various desired features like better efficiency, elimination of errors, transparency, and prevention of malpractices in examinations, besides making the results accessible electronically (Yasin et al., 2025). Furthermore, CBT systems facilitate immediate feedback and efficient data management, supporting research-based planning and evidence-driven decision-making in education.

Nevertheless, CBEE's implementation in Ethiopia still suffers from multiple structural and operational challenges. These include inadequate infrastructure, lack of enough digital knowledge among students and teachers, low internet speed, problems with software and system reliability, and lack of uniform guidelines and qualified personnel to take care of the exam as per the required standards (Ayenew & Yohannes, 2022). In rural and under-resourced institutions, these challenges may exacerbate the digital divide and create inequalities in assessment outcomes. Further, resistance by academic staff and students due to unfamiliarity and lack of training has significantly hindered the smooth changeover from paper-based testing to computer-based testing.

Given Ethiopia's commitment to updating its education system and ensuring that graduates are competent by exit exams, it is essential to critically examine the promises, challenges, and strategic directions associated with CBEE implementations. Such exploration will enlighten policymakers, management of institutions, and even donors on the kind of help that is required to realize a more inclusive, reliable, and sustainable examination system that is well adapted to the educational planning goals.

Statement of the Problem

Computer-based exit examinations in Ethiopian higher education institutions (HEIs) represent a monumental change in the country's educational assessment system from traditional to computer-based ones. To be sure, the motivation behind this change is praiseworthy, as it is designed to make sure that graduates are competent, quality assurance is strengthened, and corruption is minimized. However, the reality of this transition has been toddler steps with challenging problems. One of the root problems lies in the huge institutional capacity differences. Most universities, such as those ranked as third and fourth generation by the ministry of education, do not have the resources like well-established computer labs, power,

good internet, and they also do not have enough trained technical staff (Ayenew & Yohannes, 2022; Hunduma & Seyoum, 2022). These differences in infrastructure, apart from endangering the impartiality and trustworthiness of the examination procedure, also create a gap between those that are better equipped and those that lack resources.

Apart from that, the limited digital literacy of students and instructors is another factor adding to the difficulties. Most students attending public and private universities mainly come from rural areas and low-income families and have very little knowledge of how to use computers. So for them, doing well in computer-based exams is not only a test of the subject but also of their digital skills, which might put them at a disadvantage (Abubakar & Adebayo, 2014).

Moreover, the lack of a comprehensive national implementation plan that includes detailed guidelines, monitoring systems, and feedback mechanisms has caused questions about the truthfulness, safety, and equal rights of CBEE in different educational institutions to arise. System crashes, postponements of exams, and cases of insufficient technical support are some of the incidents of side effects that are gradually marring the process of getting trust and credibility (Luecht & Sireci, 2011; Thurlow et al., 2010; Bandari, 2014).

Nevertheless, computer-based exit examinations still have the power to transform the assessment system substantially. If well managed, CBEE could simplify the logistics of examinations, improve the time interval of results, and also improve the accuracy of data for both institutional and national education monitoring. Yet, unless the above issues are tackled with strategic planning, capacity enhancement, and the injection of resources, this enterprise will not only be a hurdle to equity and the desired education reforms but a threat as well.

Therefore, this research systematically examines the prospects, hurdles, and strategies related to computer-based exit examinations in Ethiopia. The ultimate goal is to come up with practice-based feasibility, sustainability, and educational transition recommendations for this novel assessment type.

Research Question

1. What are the potential benefits and opportunities that can be linked to the implementation of computer-based exit examinations in the selected public universities of Ethiopia?

2. What are the types of difficulties (institutional, technical, and pedagogical) that come along with CBEE implementation in higher education institutions of Ethiopia?

3. What are the strategies being used now or can be suggested to turn around the successful management and sustainability of CBEE in the universities of Ethiopia?

Materials and Methods

Research Design

This study explores the prospects, challenges, and strategies related to the implementation of computer-based exit examinations in Ethiopian higher education by deploying a qualitative case study as a design. The researchers considered a case study method as fitting because it allows a comprehensive and contextualized study of the current issue in real-life situations (Creswell, 2013; Zhang & Creswell, 2013; Once & Pagán-Maldonado, 2015).

Study Sites

The research locations were Hawassa, Wolaita Sodo, and Dilla University, and all the aforementioned three public universities are found in the Southern Regions of Ethiopia. These universities illustrate different degrees of readiness and experience in the implementation of CBEE, creating a vibrant setting for drawing comparative insights.

Participants

Participants were purposively selected to ensure that they present rich and diverse opinions. Among them were: final-year undergraduate students from different fields of study who were subjected to exit examinations; faculty members involved in teaching; university administrators, including ICT coordinators and academic vice presidents; examination officers in charge of organizing and supervising CBEE processes, and Education Ministry officials,

especially those from the quality assurance and digital learning departments. Altogether, 32 participants were involved in the study across all sites, and the selection of participants was done until no new information was revealed from the data.

Data Collection Instruments and Procedures

The study team used various qualitative methods for two months to collect data that would be triangulated and would have depth.

Semi-Structured Interviews

The interview was done with students, faculty members, examination employees, university administrators, and ministry of education officials, the faculty members attempted to discover the use of CBEE, challenges, and policy concerns that might arise from the implementation of CBEE, using prepared questions guiding the interviews.

Focus Group Discussions (FGDs)

The FGDs were held with final-year undergraduate students (6–8 per group), which allowed the collection of shared views regarding user experiences, access, digital literacy, and perceived fairness of the CBEE system.

Document Analysis

Policy and institutional documents that are related to the practice of CBEE were extensively reviewed to trace the procedures, policies, and institutional readiness for the formalization of the processes.

Non-Participant Observation

The observations were made during the exam administration of CBEE, concentrating on technical arrangements, student interaction with the system, and exam facilitation procedures.

Data Analysis

The qualitative data was analyzed using thematic analysis in accordance with Virginia Braun and Victoria Clarke's (2006) six-step approach. Data familiarization, code production, theme identification, theme review, theme definition and naming, and report writing were all part of the process. Transcripts of focus group discussions (FGDs), interviews, and observation notes were coded both manually and with NVivo's help. Based on their conceptual connections and patterns throughout the data, the initial open codes were created and then grouped into more general themes and subthemes.

Ethical Considerations

The collaborating universities' Institutional Review Boards (IRBs) granted the study ethical clearance. All participants gave their informed consent before any data was collected. The study's goal, the fact that participation was entirely voluntary, and the participants' freedom to leave at any time without facing any repercussions were all explained to the participants. By storing digital data on password-protected devices and anonymizing all participant information, confidentiality was guaranteed. Additionally, all information gathered was used exclusively for research.

Results and Discussion

The thematic analysis of data collected from diverse stakeholders: including students, faculty, examination officers, university administrators, and Ministry of Education representatives, revealed key insights into the implementation of Computer-Based Exit Examinations (CBEE) in Ethiopian higher education. Three major themes emerged: (1) prospects, (2) challenges, and (3) implementation strategies. Each theme is further elaborated through sub-themes supported by participant quotations.

1. Prospects of CBEE

The results of interviews, focus group discussions (FGDs), and document reviews have uncovered a robust and positive connection between stakeholder views and the transformative power of Computer-Based Exit Examinations (CBEE) in the landscape of higher education in Ethiopia. Stakeholders see CBEE not only as one kind of technical change but also as a reform that has a number of different benefits that include educational, administrative, and global integration ones.

1.1. Improved Efficacy and Efficiency

Several stakeholders of various kinds such as examination officers, university administrators, and instructors have pointed out that CBEE can operate well and efficiently. They acknowledged and appreciated the automation of the major examination processes.

"*Before the execution CBEE, we had to wait for the results of our works for two or three months. Now it is very fast and also accurate*." (Exam Officer, Hawassa University)

The above opinion was supported by the FGDs members who said that the updated way of working has lessened the administrative workload and errors that were related to traditional paper-based examination. Besides, the participants mentioned the reduction in printing, distribution, and collection logistics has led to considerable cost and time savings. The national digital education strategy document (MoE, 2023) says that "*CBEE enables higher education institutions to change from labor-intensive exam practices to digitized models that enhance accuracy, efficiency, and institutional accountability*."

1.2. Individualized Testing Environment

The students who were involved in FGDs were very much in favor of the personalized test experience offered by CBEE. They gave the reasons of fewer interruptions, customized question sets, and limited chances of cheating.

"*You won't be bothered by other people's answers; it is more private and you can concentrate*." (Student, Dilla University) in addition a student from WSU who was present at the FGDs also said, "*When everyone has his/her own screen, we feel calm. It feels like the test is only for me*."

1.3. Faster Score Reporting

One of the most prominent benefits to be mentioned in interviews and FGDs was that score reporting was speeded up. The automated grading system allows almost instant feedback, which stakeholders saw as very important for the timely making of academic decisions.

"*Students get their results in just a few weeks which are a very short period of time compared with manual exams facilitation where it was never possible*." (Faculty Member, Wolaita Sodo University)

The institutional assessment (Internal Exam Evaluation Report, 2023) clearly indicates that the grading cycle has been shortened from an average of 2 months to less than a week in most departments due to CBEE.

The viewpoint of faster result delivery students shared in FGDs as a motivation and reduction in anxiety was, "*It is supportive of our mental wellness. We don't have to wait for a long time to find out the results and which makes us anxious*." (Student, Hawassa University)

1.4. Potential for Global Integration

Exponents at the Ministry of Education stressed the use of CBEE as a means to harmonize the assessment systems of Ethiopian higher education with those of the rest of the world. The restructuring is considered one of the most important elements in the internationalization of the Ethiopian educational landscape.

"*CBEE is the first step towards mutual recognition and equivalency at the international level*." (MoE Representative).This outlook is greatly supported by the Higher Education Transformation Agenda (MoE, 2022), which digital examination systems are seen as one of the main means to achieving internationally recognized standards of quality assurance and mobility.

An interview with the academic registrar at Dilla University, "*With CBEE, it is much easier to show our system to people here and those from faraway places; it is trustworthy and at par with standard*s."

1.5. Enhanced Security and Consistency

Security and standardization were the main topics significantly brought up. Because of the digital nature of CBEE, encrypted access to the test, randomized question sequencing orders, and digital footprints for accountability are only a few of the security features. With these features, crimes like leaking of exams, cheating, and score manipulation become very difficult to carry out.

"*At present, we have the greatest authority to oversee the exam system. The identity of everything is logged, thereby; we know who accessed what and when*." (ICT Officer, Wolaita Sodo University)

The FGD participants also remarked that in case students tried to cooperate, the randomization of question items would make it almost impossible for them to take advantage of dishonesty. Some reports from the institutions have pointed out a significant drop in the number of cases of exam malpractice after the implementation of CBEE.

2. Challenges in Implementing CBEE

While the benefits of CBEE were well acknowledged, the rollout of Computer-Based Exit Examinations (CBEE) in Ethiopian higher education institutions has been riddled with problems. These difficulties, identified through the triangulated data of interviews, FGDs, and document reviews, are not only the reflection of the symptoms of deeper infrastructural, political, technological and fairness issues affecting the entire education sector.

2.1. Infrastructure and Resource Limitations

The shortfall of Information Communication Technology infrastructure has been the most prominent challenge that was reported in all the places where the study was conducted. Those who were interviewed and the participants of FGDs pointed out that lack of insufficient computers, weak internet, and irregular power supply were among the major problems that had led to disruptions of the smooth running of the examination process several times.

"*Because of the power outage, we were not able to hold the exam as per predetermined schedule*." (Admin Staff, Dilla University) this statement is an example of the insufficient operations that the infrastructural defects have brought about. The FGD participants were also suffering from a similar scenario of troubles in techno-equipment's for which they also spoke about postponement of the exams.

Institutional reports through document reviews indicate that a significant percentage of computer-based examination centers still do not meet the criteria for power and broadband connectivity and this leads to issues of both the scalability of the system as well as its reliability.

2.2. Security Concerns

Though rifts that are caused by humans can be minimized by means of CBEE, workers mentioned new types of digital mistrust. The concerns ranged from unpermitted system access to data being leaked, as well as potential hacking issues which the universities being a step behind when it comes to cyber security are not ready to tackle fully.

"*If the server is down or if there is someone who has altered the system, then we have no other option but to put back the whole process in the leash. Hence I am not confident that we have the capacity to handle this issue*." (Exam Officer, Wolaita Sodo University)

FGD participants shared that due to the lack of firewalls, real-time monitoring systems, and standardized protocols for handling cyber threats, this problem keeps aggravating.

According to Exam Officer, Hawassa University, "*Cyber security... digital assessment infrastructure of public universities is an area where the implementation of skilled manpower and high-tech is lagging*." The resulting security breach is a major risk to the transformation system which is otherwise promising in its transition to digital.

2.3. Administrative and Policy Gaps

The absence of centralized policy directives and implementation frameworks was also raised as one of the issues frequently voiced in interviews and FGDs. Participants noted that universities in the higher education sector mostly operated independently without a common policy or a blueprint, making their own ad-hoc systems and not getting any instructions from the Ministry of Education with the University Regulation playing a major role in terms of guideline content and the implementation being done at the university level.

"*Each university is taking its own line; there is basically a common framework from the Ministry but its implementation from one university to another varies a lot*." (Faculty Member, Hawassa University)

Limited mentions of CBEE implementation standards in the policy documents as revealed by the document review indicate a vacuum that makes consistency and accountability difficult. FGD members also emphasized the differences in situations as a result of the unclear roles and responsibilities where some institutions were able to make progress whereas the others were stalled.

2.4. Student Preparedness and Digital Literacy

The student side was particularly affected by an equity issue of a large scale, and the students from non-research universities were the most impacted. These students faced difficulties with basic computer operations like moving between questions, typing responses, or submitting exams digitally.

"*Typing and navigating through the digital questions is new to us. It just scares us more."* (Student, Wolaita Sodo University)

The FGD results revealed that these problems have a strong impact on the performance of students, particularly in rapid test situations. The majority of teachers informed that lack of digital skills rather than academic weak point was the main reasons for low scores in some students.

2.5. Test Anxiety and Equity Concerns

Besides technical literacy, many students reported that the digital format and environment unfamiliarity rapidly induced stress and anxiety, which then limited their performance. The ones with the least access to technology posed the most serious challenges, which in turn, raised concerns regarding fairness and inclusiveness.

"*How can it be fair if a person who has never used a computer, has not been exposed to the machine, and then is judged by one examination only*." (Student, Dilla University)

The conclusion of student focus groups also pointed out the absence of the aid of the necessary technologies which is essential for disabled students. At the same time, many of them also referred to the lack of sufficient accommodations for long time or modified edges users.

3. Strategies to Enhance CBEE Implementation

Synthetically and structurally, educational and policy-related strategies were concocted by stakeholders to ensure the equitable and effective implementation of CBEE in response to the above roadblocks. These tactics are equally reliant on experience gained from within the institution as well as insights from stakeholders.

3.1. Educational Orientation and Preparation

The idea most frequently brought up by the respondents was the essential role of orientation and preparation in the form of practice tests and digital literacy sessions for the faculty and students before delivery days. Users accomplish much cognizance in the CBEE platforms and lessen their nervousness through these activities.

"*Orientation made it much easier for us to avoid getting stuck in confusion and excel in our examination*". (Faculty Member, Hawassa University)

In FGDs, students confirmed that mock/practice tests significantly improved their confidence and performance. Also, institutional training logs at Hawassa University indicate, after orientations, digital test results have shown remarkable improvement.

3.2. Use of Testimonials and Post-Test Feedback

Stakeholders identified the promotion of positive user-experience narratives and the use of feedback as the two main activities that add the most value. The sharing of testimonials overcomes reticence in untrusting users while mutual posttest reflections contribute to learning, a feeling of accomplishment, and lower future anxiety.

"*The experience of confronting errors helps postulants to better grasp the material and worry less in the future*." (Exam Officer, Wolaita Sodo University)

According to FGDs, students found it helpful to know exactly where they could have gone wrong and exploring different aspects of the system for continuous practice.

3.3. Ensuring Reliable Power and Connectivity

One of the major non-negotiable issues driving the enhancement of infrastructure was the participants' suggestion on how to improve efficiency by using backup generators, solar panels, and networking to stop the shutdowns occurring during the early-stage deployment of CBEE.

"*Even with electricity, and internet, it's hard to imagine that the system is going to be very useful if it's not reliable*." (Administrator, Dilla University)

3.4. Policy Implementation and Institutional Support

The last but not least recommendation by the respondents was an account that gave more emphasis to the presence of a thorough and well-organized national CBEE implementation framework at the very top of the hierarchy, infrastructure-wise, and backed by the necessary financial and administrative resources. Apart from policy-level board meetings and stakeholder discussions, such a system would circumscribe standardization, accountability, and potentiality in the long term.

"*What we require is the ICT plan for the distant future and not only for temporary solutions during the times of examinations*." (MoE Representative)

The document currently indicates movement towards this direction, but it lacks detailed implementation guidelines as well as financing models for its better execution. We consistently heard stakeholders reiterating that genuine reform requires stable institutional proprietorship and constant Ministry leadership.

Discussion

The work first recognizes opportunities, obstacles, and methodologies as major themes disclosed in the implementation of Computer-Based Exit Examinations within the sphere of Ethiopian higher education. Besides this, the findings of this study exhibit a high degree of commensurability with several of the results of national and international studies, simultaneously exposing the similarities and peculiarities in the dynamics of the subject matter concerning this area.

Opportunities with CBEE were the very first item that came out in the discussion and were consistent with the observations made by El-Hassan et al. (2021), who found digital examinations to be more efficient from an administrative standpoint, less prone to errors, and faster in handling their results. The same line of thinking is retained in the current study by the enhancement of efficacy, fastened delivery of scores, and tailored evaluation as the main advantages. At the same time, while the pedagogical aspects of computer-based assessment highlighted in the study by Yasin et al. (2025) as the main points are flexibility and adaptation, the herewith paper distinguishes the global and institutional by stressing world integration and credibility of the institution. This difference sign post that Ethiopia's educational reforms are intertwined with its stringent calibration with international standards rather than being solely endogenous.

The recognition of problems such as lack of ICT infrastructure, fear of hacking, chaotic policy, and digital disparities among the different generations of universities due to these are also identified as challenges in this study and, are in line with the findings of Ayenew and

Yohannes (2022) who recount similar implementation blockades in the Ethiopian exit examination system. Although previous studies may have grouped these barriers, the present research illustrates a more detailed view, e.g. the rural learners and disabled persons being differently affected by a lack of resources. This research has more fleshed out the issue of fairness by linking it with the experience of test anxiety for untrained users and the nonexistence of necessary equipment making the area of educational concerns related to digital assessment more inclusive and accessible.

The last major theme uncovered in this study is the strategies for successful implementation comprising of activities for familiarization, invention for power failure, and policy framework which is in conformity with the suggested global literature about digital assessment that is especially accentuated on Africa as a center of agenda (Abubakar & Adebayo, 2014). Student testimonials and satisfaction surveys are mentioned in the research as additional influences that may bring about stronger results in the sphere of student engagement and furthermore become a point of thematic overlap between present and previously existing works. Besides, this study puts emphasis on institutional ownership and inters university collaboration reflecting the decentralized characteristics of Ethiopia's higher education system, whereas previous research underlines policy development.

To conclude, the study confirms the majority of findings on CBEE from earlier research but distinguishes itself in the conversation by including factors that are unique to its setting and using the voices of stakeholders to describe the solutions, thus being more realistic in terms of future policy and practice in digital assessment.

Conclusion and Recommendations

Conclusion

CBEE can offer a lot of good changes in assessment methodologies, but, in its current implementation, the said examination is still dealing with a complex environment that is full of both opportunities and significant challenges. The findings show great agreement among the interviewees concerning the possibilities of Computer-Based Examination (CBEE), which lie largely in better and more efficient examination management as well as the introduction of a more fair and individual testing environment, faster score delivery, and the possibility of internationalization by adapting global educational norms. Altogether these benefits underscore the ability of CBEE to bring the modality of higher education assessment in Ethiopia to a new level of modernity and quality.

Consistent with a long list of challenges, several problems hold them back from realizing these futures. One of the most significant issues among them is that of infrastructure. The problems are unreliable electricity, inadequate internet, and few computer laboratories. Physical constraints not only impede the supporting functions that make digitization possible but, more often than not, systems have to be abandoned altogether in such cases. Furthermore, a number of issues arise from the same underlying problem of security: technical security vulnerabilities, administrative and policy inconsistencies at both institutional and national levels, and a pervasive lack of digital literacy and preparedness among students are all intertwined and mutually reinforcing. This research has also exposed issues of justice and increased test anxiety in students, especially students from underprivileged backgrounds, which highlights that, without careful planning, CBEE may actually lead to further widening of educational divides.

Moreover, the study has revealed the strategies suggested by the stakeholders themselves. These strategies center on the key points of the need for proper educational orientation and preparatory programming for all users, setting up of reliable power and internet infrastructures, and, most importantly, the crafting and continuous implementing of a definite national ICT and assessment policy. The themes are connected; the key to unlocking the brightest prospects of CBEE lies in the feasible resolutions of its challenges through the organized enactment of the proposed strategies. This means that the extent of success a fragmented approach may achieve

is rather limited, whereas a holistic, strategic, and collaborative plan would make the biggest impact.

Concisely, although CBEE is seen as a fundamental tool for progress and international integration in Ethiopian higher education, its implementation is currently far from the intended goal. To fasten this process, it is not only a matter of technology but also of the need for fundamental changes in policy, coordinated efforts for capacity building, and a firm commitment to equity and access for all learners.

Recommendations

The detailed recommendations below are suggested to be the possible steps Ethiopian higher education institutions can take to equitably and effectively implement CBEE by analyzing results and identifying its prospects, challenges, and strategies:

I. Prioritize Robust ICT Infrastructure Development

II. Develop Comprehensive Digital Literacy and Preparedness Programs

III. Establish a Coordinated National CBEE Policy Framework

IV. Strengthen Cyber security and Data Integrity Protocols

V. Enhance User Support, Feedback, and Communication

VI. Address Equity and Accessibility Concerns

If these recommendations are systematically carried out, Ethiopian higher education institutions, together with the Ministry of Education, would be in a position to make use of CBEE to the full extent and offer students' assessment modes that are efficient, fair, and internationally competitive.

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