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Social and Academic Challenges of Visually Impaired Students in Sub-Saharan Universities: The Case of Cameroonian State Universities

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ABSTRACT

Inclusive education has now become a key focus in global educational governance. In fact, Sustainable Development Goal (SDG) 4 emphasizes the provision of equitable and quality education to all people, inclusive of persons with disabilities. However, despite the above international efforts towards achieving inclusive education, visual impaired students enrolled in Sub-Saharan African universities continue to face numerous challenges in both their academic pursuit and success. The present study seeks to explore some of the challenges faced by visual impaired students at the universities in Cameroon.

The study explores the link between institutional inclusion, digital inclusion, teachers' inclusion efforts, social inclusion, and academic performance among visual impaired students. Through the use of the Social Model of Disability and the Capability Approach theories, a mixed methods approach was used where a combination of descriptive analysis, comparative analysis, correlation analysis, and interviews was employed. Data were obtained from some selected state universities in Cameroon.

The results show that poor assistive devices, low digital accessibility, poor financial resources, poor accessibility infrastructure, and low inclusive education practices have a negative impact on both academic achievements and social inclusion. Moreover, the research shows that socially isolated and lacking confidence and involvement of visually impaired students are due to stigma and lack of institutional assistance. The comparison analysis shows that educational inclusion and academic success depend on the degree of administrative commitment and digital accessibility within universities.

The correlation analysis confirms that a significant positive correlation exists between digital accessibility and academic achievements; therefore, high educational results can be achieved through improved digital access to assistive devices and systems. Likewise, the role of teacher support and social inclusion is significant for academic success.

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1. INTRODUCTION

The phenomenon of inclusive education has increasingly become a very prominent feature in contemporary educational policy. International agencies such as the United Nations Educational, Scientific and Cultural Organization as well as the United Nations have asserted the need for making education available to all irrespective of their physical abilities, gender, social class, and economic standing. The international community has expressed its commitment to achieving the SDGs, especially SDG 4, which aims at "ensuring inclusive and equitable quality education and promoting lifelong learning

opportunities for all." In other words, inclusiveness in the educational process can be said to transcend merely being an educational issue. Under these circumstances, the education of persons with disabilities has been recognized internationally as one area that demands more attention. It is no longer appropriate to think of disability as simply the condition of being physically or psychologically disadvantaged; it needs to be understood socially and as a human rights issue since most exclusions are due to environmental, institutional, and socio-cultural factors rather than actual disabilities themselves. Visually impaired learners are usually excluded from education because of the inability of institutions to create enabling learning environments and infrastructures.

The application of inclusive higher education is faced with numerous difficulties and challenges, especially in most developing countries where inclusive higher education is still not widely practiced in universities. While some nations in Africa have already adopted international regulations like the United Nations Convention on the Rights of Persons with Disabilities, their implementation still faces numerous obstacles due to financial problems, inadequate policy mechanisms, and lack of education resources. Hence, individuals suffering from blindness or other kinds of visual impairment are systematically discriminated against and marginalized by higher education institutions.

In the case of Cameroon, there was a significant increase in the number of students enrolled in university education over the last two decades due to the implementation of reforms intended to enhance access to university education for all segments of society. Universities such as the University of Yaoundé I, University of Buea, University of Douala, and University of Dschang now accept an increasingly diverse range of students including those with disabilities. Nevertheless, while access to higher education in quantitative terms may have been improved, quality issues related to the process of inclusion are prevalent.

One of the major issues that is quite obvious involves the problem of physical infrastructure. Universities in Cameroon are rarely built with students with disabilities in mind. Classrooms, libraries, administrative offices, stairways, and living quarters do not have any accessibility aids such as tactile pavement, braille signs, lifts, and orientation facilities. For visually impaired students, moving about campus becomes challenging and even risky due to a lack of accessibility features, leading to reduced freedom and engagement with the learning process.

Another prominent problem involves the issue of learning resources and technology. Modern inclusive education is based on the idea of digital accessibility and availability of adaptive technologies like screen readers, braille devices, audio books, magnification systems, and online platforms for inclusive learning. However, in many state universities of Cameroon, adaptive tools and assistive software are either rare, unaffordable, or absent altogether. University libraries typically lack any braille materials or digital copies of textbooks compatible with these technologies. As a result, visually impaired students have to rely on the help of fellow students or friends and relatives to access study materials.

In addition to these academic challenges, there are also notable social and psychological challenges faced by visually-impaired university students. Discrimination, stereotyping, and stigma are still common practices within university settings that hinder effective communication and interaction between both groups. In addition, the systems of university governance and policy enactment need to be better organized since although Cameroon has enacted texts on the protection of people with disabilities, implementation of these policies in universities still varies considerably.

However, even though there are a lot of challenges that these students face, they still manage to adapt and make use of various resources in order to achieve their academic goals. They seek support from friends, engage in online self-study, join community organizations and even use their personal motivation in order to succeed.

Consequently, this paper will discuss the academic and social difficulties encountered by visually challenged students studying at the state universities in Cameroon in the context of inclusive education. The main focus of this study is to discuss the impacts of infrastructure challenges, technological gaps, pedagogy issues, and social discrimination that these students experience during their university life. In addition, this paper also discusses some possible measures that could be taken to enhance the inclusive higher education system in Cameroon. These include the creation of supportive infrastructure, capacity building among teachers, introduction of assistive devices, among others.

2. Literature review

Scholarly studies of inclusive higher education have now clearly shown how visually impaired students suffer from a variety of institutional and structural

inequalities in university settings globally. Inequalities are not simply created as a result of disabilities but mainly stem from institutional frameworks, educational policies, technology, and societal perceptions. Research on this topic thus defines disability from the viewpoint of structural exclusionism, arguing that many obstacles facing visually impaired students are due to the way the educational system is organized itself rather than disability.

2.1. Concept of Visually Impaired Students

The term "visually impaired students" is used to denote students whose visual impairment affects their abilities to perceive information in its visual forms (WHO, 2011; Oliver, 1990). Nevertheless, modern approaches in disability and education state that the notion of "visually impaired students" is not simply associated with the presence of a particular disability, as it is usually referred to as a complicated educational, social, psychological, technological, and institutional problem which affects the opportunity to learn (Barnes & Mercer, 2010; Shakespeare, 2013).

Students who have visual impairment can be differentiated according to various criteria since they represent an extremely heterogeneous group of learners (Hewett et al., 2017). On the one hand, some students suffer from complete blindness and use only non-visual means (Braille, audio, touch learning, etc.). On the other hand, others have some residual vision, thanks to which they can recognize certain objects with the help of magnifiers or special lighting equipment.

According to World Health Organization (WHO), visual impairment involves both blindness and low vision due to congenital, genetic, health, and accidental reasons. However, educationalists' definition is broader, including not only the definition of visual impairments but also implications and influences that it may have on the possibility of educational access and participation (Florian & Black-Hawkins, 2011).

Educationalists define visually impaired students as learners whose visual impairment necessitates changes in teaching methodologies, textbooks and other learning resources, classroom design, examination process, and educational technology (Konur, 2006; Moriña et al., 2015). Therefore, visually impaired learners may have difficulty adapting to such educational environments.

It is important to note that this definition shows the relationship between the person and the learning environment, not the disability alone. The theory of disability suggests that problems faced by visually impaired individuals when learning in an institution occur because the institutions do not meet their different needs.

Educational and medical literature generally classifies visually impaired students into two major categories:

Blind Students: Blind students have minimal to zero eyesight and depend heavily on non-visual methods of teaching (Kelly & Smith, 2011). Some of the common techniques used include braille reading, text-to-speech applications, tactile graphics, audio learning tools and voice-enabled technology.

Low-Vision Students: Low vision refers to partial blindness, meaning that although the individual still has some eyesight, he or she cannot undertake educational activities within the normal classroom setting. Some of the modifications required might include large print books and documents, magnifying programs, improved lighting and adjusting seating arrangements.

In the context of inclusive education studies, visually impaired students are referred to as those who have educational needs since they need educational accommodation to enable equal access to learning. This is not an indication of any form of inadequacy or limitations in terms of academic capability. It has been proven that visually impaired students have equal academic capabilities to those of sighted learners if they are offered education materials, learning environment, inclusion in learning and educational assistive technologies (Florian & Black-Hawkins, 2011; UNESCO, 2020).

Thus, educational disparity results not from visual impairment, but rather from the lack of systems

2.2. Structural and Institutional Challenges Facing Visually Impaired Students in Higher Education

Current academic work in inclusive higher education shows that visually impaired students face systematic inequalities in university settings around the world (Oliver, 1996; Barnes & Mercer, 2010). In other words, the problems they face are not confined to personal physical disabilities but created and maintained by institutions, educational policies, technology issues, and societal perceptions. Modern research considers disability in terms of structural exclusion because much of what is considered a problem for visually impaired students is a consequence of the structure of the education system rather than disability.

A significant trend in current research literature involves issues of structural inequality in institutions of higher education (Bourdieu & Passeron, 1977).

Structural inequality entails systematic institutional factors that put some students at a disadvantage in educational settings. The nature of structural inequality for visually impaired students can be manifested in terms of an absence of accessible infrastructure, rigidity in teaching procedures, examinations conducted on exclusionary bases, as well as differential access to academic resources (Fuller et al., 2004). It has been suggested that universities were built with the assumption that students attending them would be able-bodied.

Several studies carried out in various African universities indicate that physical accessibility is among the biggest impediments towards inclusiveness (Chataika, 2010; Mji et al., 2011). The campuses of numerous African universities still fail to have disability-friendly infrastructure such as tactile paths, lifts, braille signs, accessible transport systems, dormitories, and orientation tools for the blind (Eide & Loeb, 2006). Consequently, visually impaired students experience various mobility issues which impact negatively on their ability to take part in academic activities and be independent. Various studies carried out in nations like South Africa, Nigeria, Kenya, and Ghana indicate that the unavailability of appropriate infrastructure causes increased absenteeism, fatigue, decreased involvement in class, and psychological stress among disabled students (Matshedisho, 2007; Chireshe, 2013).

The literature further highlights the need for digital inclusion in current university education. With the rise of computer-based learning, online libraries, virtual classrooms, and computer-based examinations, access to technology plays an important role in determining the academic success of students (Castells, 2010). Numerous universities in Africa have encountered technological hindrances which adversely affect the visually impaired students. Studies demonstrate that computer-based learning systems are not compatible with assistive devices such as screen readers, while academic materials are provided in an inaccessible format like scanned documents lacking optical character recognition features (Kelly & Smith, 2011).

Despite this, there still exist a number of structural barriers faced by African universities that prevent inclusive education. The scarcity of funding is among the top concerns mentioned in scholarly literature. Most public universities face budget constraints that force them to focus on basic operations while ignoring disability inclusion initiatives Teferra & Altbach, 2004). Thus, assistive technologies such as braille printing machines, refreshable braille devices, screen readers, audio labs, and digital databases cannot be provided due to their high costs. The absence of these technologies results in what scholars call a "digital disability divide," where visually impaired students are denied access to the opportunities provided by digital revolution in higher education (Dobransky & Hargittai, 2006).

Apart from the problem of funding, another important aspect related to the inclusion of persons with disabilities is poorly developed disability governance. Disability governance can be defined as "the sum total of disability policies, procedures, and practices" which serve to regulate disability inclusion within an educational institution (Degener, 2016). Studies show that many African universities lack disability policies, disability units, monitoring tools, and disability inclusion strategies altogether. Disability inclusion initiatives rely either on informal agreements, personal goodwill of university staff members, or are limited to a project format only (Ntombela & Soobrayen, 2013).

However, African universities continue to face substantial structural challenges that limit their ability to achieve the objective of inclusivity. Among the most common problems noted in the literature is that of financing. Public universities typically have constrained budgets which allow them to finance basic operations while overlooking inclusion measures for people with disabilities. As a consequence, tools that can help visually impaired students study at university, such as Braille printers, refreshable Braille display, screen reading applications, sound labs, and online accessible databases, remain too expensive to implement at many universities.

Aside from the lack of financing, poor disability governance is also considered an important problem in the literature. The term disability governance describes the set of policies, governance mechanisms, administration and laws regulating disability inclusion in educational institutions. Studies reveal that many African universities fail to have any disability inclusion policies, dedicated disability inclusion units, monitoring and implementation mechanisms. In other words, disability inclusion in African universities relies on informal, goodwill-based arrangements or short-term projects.

It is also pointed out that accessibility is not limited to physical aspects but rather can be considered a multifaceted term. Previous studies on the topic of accessibility tended to focus exclusively on such aspects as ramps, elevators, and building design. Today's inclusive education scholars apply a much more comprehensive definition of accessibility, which

encompasses academic, digital, social, and psychological accessibility among others (Ainscow, 2005).

Academic accessibility can be defined as changes made to the teaching process, learning material, and testing techniques (Florian & Black-Hawkins, 2011). Visually impaired learners tend to have trouble coping when the lecturer makes heavy use of visual learning materials without providing an accessible alternative. Diagrams, graphs, PowerPoint presentations, and notes written on the board by the lecturer may be unavailable if he/she does not possess inclusive pedagogic skills. Moreover, visually impaired students may fail standard examinations due to lack of time, braille versions, or oral examinations.

Library accessibility is another area of importance highlighted by scholars (Todaro, 2005). Libraries at universities serve as important locations for academic research. Unfortunately, many libraries in developing nations do not contain braille books, audio books, digitized academic books, or an accessible cataloging system. Many scholars believe that exclusion from the library hampers the academic independence of blind scholars, especially when one considers the necessity of having access to information for university studies.

2.3. Social Inclusion, Institutional Attitudes, and Research Gaps in Cameroon

An equally important dimension emphasized by researchers includes psychosocial support (Reindal, 2008). As more studies confirm, disability inclusion goes beyond theory. It is a psychological and social experience, as well. Students with visual impairments frequently encounter social isolation, lack of self-confidence, anxiety, and other emotional challenges at university. Discriminatory attitudes toward disabled people from students, lecturers, and management officials can lead to the perception of discrimination. There are many negative stereotypes associated with visually impaired students, such as intellectual inferiority, overdependence on others, and inability to perform excellently academically. Consequently, some students refrain from participating in group activities, including class debates, student clubs, and so forth.

Inclusivity of universities is also a question of institutional attitude towards disability. Barton (2003) claim that institutions fostering inclusivity ensure positive social integration, better peer support, and enhanced self-confidence among disabled students. On the contrary, organizations that consider disability to be a disadvantage or a matter of marginal importance replicate discrimination practices despite having inclusive policies in place.

Studies undertaken in Asian and European settings offer useful lessons on how the institutional support structure can be developed to enhance the performance of visually impaired learners. In Asian and European nations such as Japan, China, United Kingdom, and Germany, most universities have increasingly developed an inclusive education system by creating support structures, adopting accessible infrastructures, pedagogies sensitive to disability, as well as using assistive devices funded by the state. Studies done in these regions show that when universities create a proper support system, visually impaired learners perform better academically, socially, and psychologically.

Such studies also make clear the difference between access and inclusion at the institutional level (Ainscow & Miles, 2008). Most universities admit learners with disabilities in principle. However, true inclusion requires that universities change their policies, structures, and practices. This means that true inclusion must involve institutional action.

In the Cameroon situation, the existing literature is quite restricted even as the issue of incorporating persons with disabilities into higher education becomes a cause for concern. The available literature seems to be more interested in studying primary or secondary school situations, whereas the university experience of visually impaired students has not been studied enough. This gap in the literature means that there is very little knowledge about how visually impaired students adapt and cope with different challenges at universities in Cameroon.

The lack of relevant literature from the local area has several consequences. First, it hinders the development of policies based on accurate information since policy makers do not have adequate information about the needs of visually impaired students. Second, it adds to the marginalization of disability issues in discussions concerning higher education.

The gap in this study is especially important in light of the fact that Cameroon offers a special environment for education, which is defined by the linguistic dualism, the fast-growing number of universities, low levels of educational budgeting, and infrastructural disadvantages. The experience of visually impaired students at the state universities of Cameroon could differ greatly from the experience described in the literature on similar topics pertaining to Western or Asian contexts.

At the same time, the study of the experience of visually impaired students makes it possible for the researcher to shift from a purely policy-based

perspective to a more grounded approach to the issue. Experience studies focus on the perspectives of the learners themselves and consider their coping mechanisms, views on reality, and interpersonal relations.

From the findings, it is clear that inclusive higher education entails holistic institutional transformation in terms of infrastructure, technology, teaching methods, governance, and social perspective. Although there has been considerable success internationally, there exist vast gaps between the educational systems of developed and developing countries. In Cameroon and other parts of Sub-Saharan Africa, blind students still face structural obstacles hindering their access to higher education on an equal basis. This calls for effective policy enforcement, additional funding, changes in pedagogy, accessible technology, and increased institutional commitment to disability rights and education.

3. Theoretical Framework

This study adopts the Social Model of Disability and the Capability Approach developed by Amartya Sen.

3.1. Social Model of Disability

The Social Model of Disability is one of the most important theoretical models of modern-day disability studies and inclusive education research (Oliver, 1990). The Social Model of Disability was developed through the works of scholars and representatives of the disability rights movement in the latter part of the twentieth century as an alternative to the conventional medical model of disability (UPIAS, 1976). While the medical model of disability considers disabilities to be individual abnormalities or illnesses, the Social Model of Disability considers them to be socially constructed as a result of the inability to adapt to diverse human needs of social institutions, including educational institutions such as universities.

It should be noted that, from the viewpoint of the Social Model, visual impairments do not necessarily cause social exclusion; rather, they become a source for it only if the institution is unwilling or unable to change its environment to suit diverse people's needs**.**

Within the context of higher education, the Social Model acts as a strong tool in analyzing the experiences of visually impaired learners in Cameroonian state universities. This model does not place its focus on visual impairments of the learners, but rather the institutional barriers present within universities. Thus, the reason why visually impaired learners are marginalized at universities is due to the fact that universities are meant for non-disabled students.

The concept of environmental exclusion plays an important role within the Social Model (Imrie, 1996). It refers to the process through which universities make it impossible for visually impaired learners to be included in learning processes due to the existence of certain barriers in form of stairs without tactile guidance, lack of elevators, lack of braille in library materials, etc.

Applying the Social Model in the context of Cameroon would account for how students with visual impairment continue to face discrimination regardless of educational inclusion initiatives. While greater access to tertiary institutions has been attained, universities continue to fail to offer adequate mechanisms of supporting disabled students, lack accessible infrastructure and culture of inclusion. Thus, accessibility problems highlight the fact that disability inclusion cannot be understood as an issue of merely including students with visual impairment in university institutions but creating a change in the systems.

The Social Model of disability is highly applicable here because it focuses on institution accountability for addressing discrimination. Rather than placing responsibility for overcoming barriers on students themselves, the model requires universities and states to address them and makes a case for inclusive policy making, disability-inclusive teaching, technological and educational governance.

Nonetheless, researchers have pointed out certain weaknesses in the Social Model as well. The major weakness of this model is the tendency to ignore the personal and psychological aspects of disability while being primarily concerned with social problems. In the case of visually impaired students, their psychological state, health issues, or personal approaches to coping can affect their academic performance as well. Nonetheless, regardless of its weaknesses, the Social Model can be quite useful in studying discrimination in educational institutions.

3.2. The Capability Approach

Another important theory in relation to inclusion, human development, and social justice is the Capability Approach. The Capability Approach was formulated mainly by Amartya Sen and then developed further by other prominent scholars like Martha Nussbaum (Sen, 1999; Nussbaum, 2000). Contrary to theories based on economic development or resource-based measures of human development, the Capability Approach focuses on the freedoms and capabilities people actually have in order to realize what they are entitled to in life.

According to Amartya Sen (1999), an individual's well-being should not only be judged in terms of his or her possession of certain resources but rather by the capability he or she actually has to use these resources. Hence, according to the Capability Approach, there is an important difference between "resources" and "capabilities." Two individuals can have equal rights or educational opportunities, but still have very different capabilities due to various factors.

In the realm of higher education, the Capability Approach implies that the inclusiveness of universities cannot be evaluated in terms of admitting visually impaired students to the universities. Instead, inclusion must entail guaranteeing that the visually impaired students have the opportunity, freedom, and capacity to perform well academically, socially, and personally.

From the perspective of Cameroonian state universities, the Capability Approach is able to provide an insight into the way that inequalities within institutions can limit the academic freedom of the visually impaired students. While the visually impaired students can have access to the education at the universities, their lack of assistive technologies and other resources would result in their inability to develop their academic skills.

The theory regards visually impaired students as active rather than passive recipients of welfare and assistance, who have the potential to achieve intellectually, think rationally, take decisions, show leadership, and contribute socially whenever the opportunity arises. It refutes the paternalistic notion that disables people as individuals who are helpless and unable to do certain things on their own.

Conversion factors also come under the purview of the Capability Approach. Conversion factors are the social, organizational, physical and personal factors that enable the individual to make something out of available resources. In terms of education at university level, the use of technology, accessibility of libraries, supportive lecturers, university policies, friendship groups and financial help can be viewed as positive conversion factors.

Inaccessible campuses, discrimination, poor access to information on the internet and inadequate governance of disabilities can be considered as some of the negative conversion factors, which prevent visually impaired students from utilizing educational systems. Therefore, the Capability Approach clearly shows that inequality is caused by not just resource scarcity, but also by unequal conditions among students.

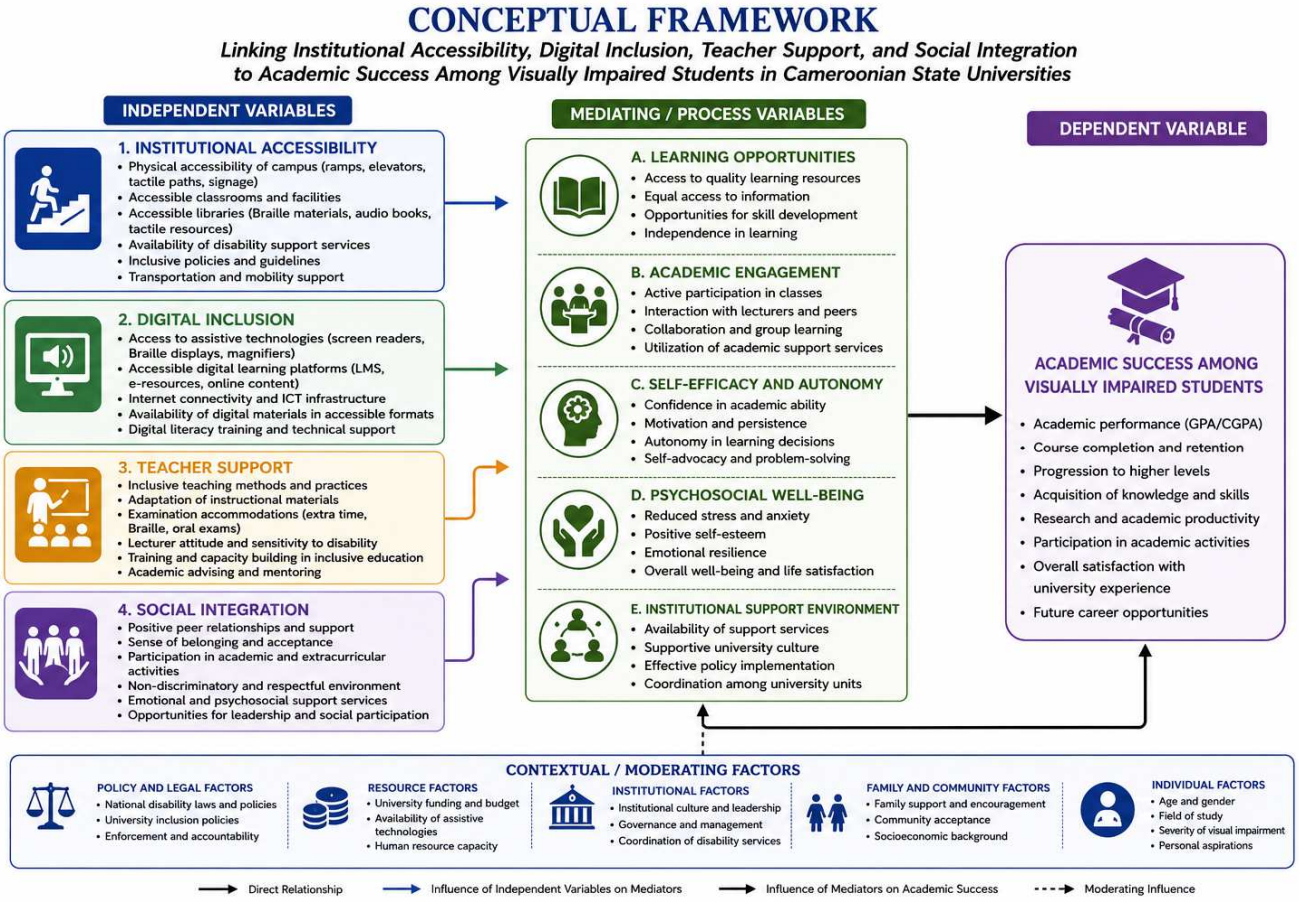
An additional factor in terms of the Capability Approach is that of dignity and social inclusion. Sen believes that development also entails the broadening of the capabilities of individuals in order to allow them to take part fully in society. For blind students, education at the university level not only provides access to job opportunities but also contributes to their social inclusion and empowerment.

One of the strengths of the Capability Approach is that it can be applied effectively to understand psychosocial aspects of inclusion. A student who is discriminated against or left out socially can suffer from lack of confidence, motivation, and participation in spite of being able to access educational materials. The theory understands that psychosocial factors are an integral part of development.

However, even with these benefits, there are some flaws associated with this approach. First, some scholars claim that capability is hard to put into practice since it has multiple dimensions (Sugden, 1993). Second, it may be tough to measure opportunities, freedom, and well-being. Regardless of these drawbacks, the capability approach is still considered relevant because of its detailed understanding of institutions in shaping human life chances.

3.3. Conceptual Framework and Hypotheses

The conceptual framework links institutional accessibility, digital inclusion, teacher support, and social integration to academic success among visually impaired students.



The hypotheses of this conceptual framework are as follows

H1: Institutional accessibility positively influences academic success.

H2: Digital accessibility significantly improves educational participation.

H3: Teacher support positively affects social inclusion.

H4: Social inclusion positively correlates with academic achievement.

4. Methodology

4.1. Research Design

This was a mixed methodological approach which involved both quantitative and qualitative methods of data analysis. The application of the mixed method design was especially pertinent for this study due to the complexity of the phenomena being studied, which includes both quantifiable organizational variables and qualitative elements such as individual experiences, perception, attitude, and social reality. On the other hand, the use of the quantitative element in this research allowed the researcher to explore the measurable connection between the studied institutional variables and student achievement for those who were visually impaired. At the same time, the use of the qualitative aspect gave a better understanding of the experiences, feelings, coping strategies, and perceptions of the respondents. Through the combination of the two elements, it was possible to achieve methodological complementarity.

4.2. Location of the Study

Six state universities in Cameroon served as sites for the gathering of data. University of Yaoundé I, University of Douala, University of Buea, University of Dschang, University of Ngaoundéré and University of Maroua. These universities were selected purposefully since they offer an extensive representation of the nature of higher education in Cameroon. Several factors were taken into consideration when selecting these universities, which include academic, geographical, institutional, linguistic, and comparative issues.

First, the selected universities cover the different geographical areas of Cameroon; hence, there was regional representation in the research regarding inclusive higher education. It is important to note that Cameroon has regional differences in terms of infrastructure, economic development, technology, and resources. By ensuring the inclusion of different universities from different geographical regions, the research covered variations in accessibility and disability.

Secondly, the selected universities represent the duality of the language in Cameroon's educational

system. The country uses an education system that involves institutions speaking both French and English based on its history. The importance of choosing universities in both language groups lies in the difference that might be experienced between the two.

Third, the selected universities were chosen because they are some of the biggest and oldest universities in Cameroon. These universities have sizable enrollments of students and hence a greater likelihood of being able to sample visually impaired students. The reason why such universities with large and diverse student enrollment were more suited to sample was that the research topic involved inclusivity in higher education.

Fourth, the universities were chosen because they are vastly different in regard to institutional capability, infrastructural development, and technological resources. While some universities have relatively better institutional infrastructure and facilities, others lack in that regard due to various limitations. It is for this reason that they were chosen in order to enable comparative analysis between them with regard to the topic of study.

Lastly, the chosen universities constitute some of the most powerful institutions of the state in the context of Cameroonian higher education. In many ways, they set the tone for how higher education functions in the country. Therefore, examining these universities offered an interesting perspective on the current status of disability inclusiveness in public higher education in Cameroon.

4.3. Sample

Visual impaired learners, teachers and administrators were purposively selected to take part in the study.

The purposeful selection of visually impaired students, lecturers, and administrators from universities in Cameroon for inclusion in the study was appropriate for this study, considering that the three represented categories of study participants who could best reflect reality regarding the issue of disability inclusion in universities. Purposive sampling in such research designs involves the sampling of participants who possess knowledge about an identified phenomenon of interest.

Purposive sampling is defined as a sampling design in which researchers deliberately choose participants due to their knowledge, experience, and familiarity with a particular phenomenon (Creswell, 2014). As a result, in this study, purposive sampling enabled the researcher to identify visually impaired students, lecturers, and administrators who could offer credible and rich information about visually impaired students' educational experiences and inclusion mechanisms in state universities in Cameroon.

The first group of participants included visually impaired students. They constituted the main subjects of the research conducted by the researcher. They were strategically selected since they had firsthand experiences about the problems that arise from studying, using technology, participating in institutions, and interacting in society as disabled students. In light of this, since the aim of the research was to explore obstacles that visually impaired students face, it was important to gather information from them.

The second group of respondents was lecturers/teachers. Lecturers were deliberately chosen because they occupy an important position as far as influencing the academic experience of visually impaired students in universities is concerned.

The final set of participants comprised university administrators. These individuals were specifically selected based on their positions and roles in the institution since they play an important role in governance, policy-making, education, and financial matters. Given that the research dealt primarily with institutional inclusion practices, these individuals could offer insightful explanations into the policy aspects of disability inclusion in universities.

4.4. variables

Independent Variables

The independent variables of the research can be defined as those factors, which determine the experiences and success rates of blind students in state universities in Cameroon. Thus, the key independent variables can be divided into institutional accessibility, digital inclusion, teacher support, and social integration. Institutional accessibility is characterized by the level of adjustments to the needs of visually-impaired students made by Cameroonian universities. This variable includes physical accessibility of the campus, classrooms and libraries, access to Braille and tactile equipment, disability support and services, as well as inclusive policies developed and used by the universities. Digital inclusion describes the level of access of the university students to the educational and e-learning technologies. Specifically, digital inclusion includes such elements as access to assistive technologies and software, use of screen readers and Braille displays, e-learning and ICT accessibility, and development of digital literacy skills. Teacher support is concerned with the help provided to blind students by lecturers using different teaching strategies and approaches. Finally, social integration is described as the extent to

which students are included in the life of the university.

Mediating Variables

The mediating variables are the intermediary variables through which institutional and social factors affect the success of visually impaired students academically. The mediating variables show how issues of accessibility, inclusion, teachers' involvement, and social inclusion can be turned into educational achievements. Academic participation is one of the key mediating variables in that students who take part in classroom activities and the educational process tend to succeed. Learning opportunities are other mediating variables because the access to learning materials, inclusive practices, and assistive technology make it possible for students to learn better. In addition, self-confidence and autonomy are key mediating variables because education provided within an appropriate environment makes it possible for visually impaired learners to become independent and motivated. Psychosocial well-being is yet another important mediating variable as it affects students' academic performance positively through improving their emotional stability and security. Finally, classroom participation is another mediating variable in that it facilitates academic success.

Dependent Variable

The dependent variable in this study will be the academic success of visually impaired students. By this term we mean the educational results and accomplishments that emerge as a result of cooperation between support mechanisms and students in a university setting. Such academic success may be measured by such indicators as GPA or CGPA, course completion rate, rate of retention and completion of education at the institution, development of professional and academic skills, class participation, and general satisfaction with the experience of studying at a university. Here academic success does not only refer to success in exams; in addition, it refers to the level to which visually impaired students are able to actively engage in university activities.

Moderating and Contextual Variables

The moderating or contextual variables refer to external variables such as the environment that can enhance or diminish the association between institutional support mechanisms and academic performance among blind students. The government is a crucial actor due to the existence of inclusive education policies at the national level that have implications on practices and governance of disabilities in universities. Funding of the university also determines the presence of accessible infrastructure, assistive devices, and disability support services. Another contextual variable of concern is institutional culture since institutions with an open-minded attitude towards disabilities create enabling learning environments. Parental support becomes crucial when considering the emotional, motivational, and economic abilities of blind students to pursue their studies. Economic variables also become relevant considering how poverty can constrain students' ability to afford assistive devices and educational materials. Lastly, the extent of visual impairments is likely to determine the extent of accommodation needed by these students, with the availability of assistive devices influencing their academic performance.

5. Data Presentation and Analysis

5.1. Institutional Indicators Across Universities

The table below shows an analysis of the inclusiveness of education for students with visual impairment in six main state universities in Cameroon. These are assessed through five main institutional criteria: Accessibility, Digital Access, Teacher Support, Social Inclusiveness, and Academic Performance. Scores of between 0 and 100 are used in the table, where the higher the score, the more favorable the condition of inclusive education.

Table 1. Institutional Indicators Across Universities

University	Accessibility	Digital_ Access	Teacher_ Support	Social_ Inclusion	Academic_ Success
University of Yaoundé I	72	70	75	69	72
University of Douala	68	66	70	63	67
University of Buea	60	63	71	64	65
University of Dschang	62	69	68	57	64
University of Ngaoundéré	45	40	46	42	44
University of Maroua	41	38	40	36	39

The University of Yaoundé I achieves the best results for all variables; This means superior organizational structure, better disability services, superior infrastructure and effective academic inclusion programs. The result of academic success (72) shows that good conditions have a positive impact on student academic performance.

The University of Buea, the University of Dschang and the University of Douala are also doing great. High performance levels are attributed to good teacher assistance, strong educational background in English where learning is centered around students and more social integration structures.

This proves that good academic settings play a major role in determining student success.

University of Ngaoundéré and University of Maroua achieve the lowest scores on all measures. This might be due to scarcity of funds, poor institutional infrastructure, inadequate disability governance and uneven education spending geographically.

Low academic success scores show that blind students at these universities experience great educational obstacles.

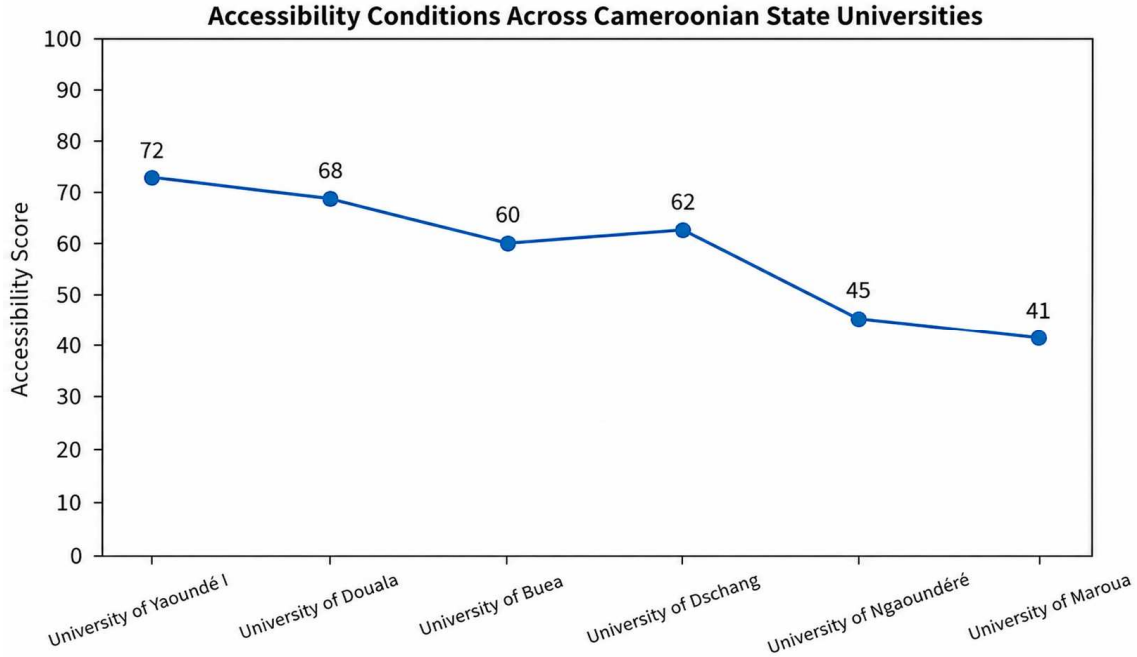
There is a clear positive correlation between institutional inclusion and academic success. Universities that have more accessibility, better digital infrastructure, good support for teachers and more social inclusion also exhibit better academic success in terms of visually impaired students. Therefore, the results obtained prove the main thesis of the research that inclusive environment contributes to better learning and academic performance of visually impaired university students.

The results also provide valuable insights into the existing regional and institutional disparities among Cameroon universities regarding the issue. Even though some institutions are progressively moving towards inclusive education, many are still struggling with various obstacles.

5.2. Findings and Interpretation

Accessibility Conditions

Figure 1. Accessibility conditions across Cameroonian State Universities



The graph above represents the accessibility levels experienced by visually impaired students in six state universities in Cameroon. Accessibility scores are ranked between 0 and 100. In this case, the larger the score, the greater the institution's level of accessibility for visually impaired students.

The graph demonstrates that there are significant discrepancies in the accessibility conditions among Cameroonian state universities due to inequalities in institutional inclusion of visually impaired students. The University of Yaoundé I has scored 72 on the index, which is the highest score among the universities surveyed. Such high scores show that this institution possesses better physical infrastructure and disability support services and better accessibility to classrooms and libraries. In addition, such institutions are aware of issues related to disability inclusion. As one of the oldest and most prestigious universities in Cameroon, this institution receives more funding, collaboration opportunities, and better infrastructure. Thus, students with visual impairments studying in this institution enjoy better academic involvement, independence in moving around the campus, and have better access to study resources. However, the score of 72 on the 100-point index still shows that there is room for improvement in terms of disability inclusion even in the most accessible university in Cameroon.

The University of Douala is next on the list, earning an accessibility grade of 68, which means that while there are quite favorable conditions of inclusion in the institution, there are still constraints to be seen in the university. It should be noted that the somewhat higher grade might be a consequence of such factors as the institution's presence in the city and availability of ICT infrastructure, as well as modernization and student support structures. Students suffering from visual impairment, studying at the University of Douala, may have partial access to assistive technology, partially adapted physical and learning spaces, and developing digital inclusion. At the same time, the slight gap between Yaoundé I (72) and Douala (68) illustrates that there are still accessibility issues among urban universities.

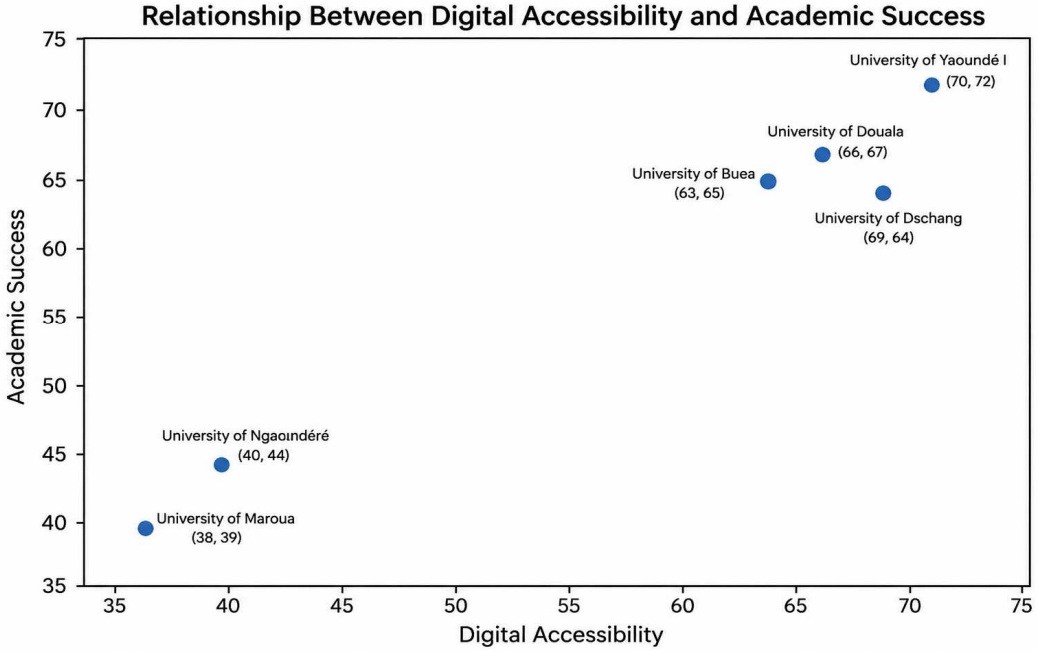
The graph also indicates that the level of accessibility for University of Buea and University of Dschang is an intermediate level, whereby both of them have received 60 points and 62 points respectively. While these findings show the presence of some moderate levels of accessibility, they reveal significant weaknesses in the institutions involved. The similar score points indicate the existence of comparable infrastructures, measures put in place to ensure that the needs of the disabled are met, as well as the level of inclusiveness of the respective institution. The slightly higher score point in Dschang might be as a result of its organized structure, greater institutional readiness, and stability in its administration. Nonetheless, both of these institutions fall far below the desired standards of inclusive education.

In terms of lowest accessibility scores, University of Ngaoundéré and University of Maroua have scored 45 and 41 respectively. From their low accessibility scores, there is a great level of institutional problems when it comes to disability inclusion and accessibility. Poor physical infrastructures, lack of proper assistive technology, poor disability governance, as well as lack of education support system are some of the issues which appear from the data provided. This can be seen from the sharp drop in accessibility scores from Dschang's 62 to University of Ngaoundéré's 45. This can be due to regional disparities in public funding, poor infrastructural development, poor technological ability, as well as poor institutional capacity.

In summary, the graph portrays the high disparity among the various levels of accessibility in Cameroonian state universities with inadequate accessibility conditions for full inclusion into university learning. Better accessibility conditions can be observed in universities that possess well-developed infrastructures and other institutional capabilities while other poorly resourced universities lack accessibilities conditions. These findings have confirmed the claim that institutional accessibility is key in influencing educational opportunities and experience for visually impaired students. It is important that more disability policies be formulated as well as investments in assistive technology and infrastructural upgrading in order to address the disparities within Cameroon.

5.3. Correlation analysis

Figure 2. Relation between digital accessibility and academic success



The graph above is a scatter plot analysis showing the association between Digital Accessibility and Academic Achievement among visually impaired students in six state universities in Cameroon.

The X-axis shows the scores for Digital Accessibility while the Y-axis shows the scores for Academic Achievement. Each of the points represented in blue shows one particular university and its scores.

University of Yaoundé I (70, 72). The Records of University of Yaoundé I are Digital Accessibility = 70, Academic Success = 72. This university is situated at the topmost point of the chart, demonstrating best results in both variables.

Based on these data, one can state that the use of technology is better for blind students; technology makes education more inclusive and digital accessibility helps students be more successful academically.

University of Douala (66, 67). The Records of University of Douala: Digital Accessibility = 66 and Academic Success = 67. From these statistics, it is clear that the university has relatively good levels of digital inclusion and academic success.

University of Buea (63, 65). The University of Buea records are Digital Accessibility = 63 and Academic Success = 65. The university exhibits moderate levels of performance in all the variables. This implies that there is relatively good digital learning system academic environment is favorable; institutional inclusion level is moderate.

From the university's score, it is evident that though the level of digital accessibility is not excellent, it promotes good academic performance among visually impaired students.

University of Dschang (69, 64). Digital Accessibility = 69; Academic Success = 64

Though there is relatively good digital accessibility

University of Ngaoundéré (40, 44). Digital Accessibility = 40; Academic Success = 44

The university demonstrates low performance in both variables. This means that assistance technologies are unavailable, ICT infrastructure is poor, policy on digital accessibility is inadequate and learning possibilities for visually impaired students are limited.

University of Maroua (38, 39). Digital Accessibility = 38; Academic Success = 39

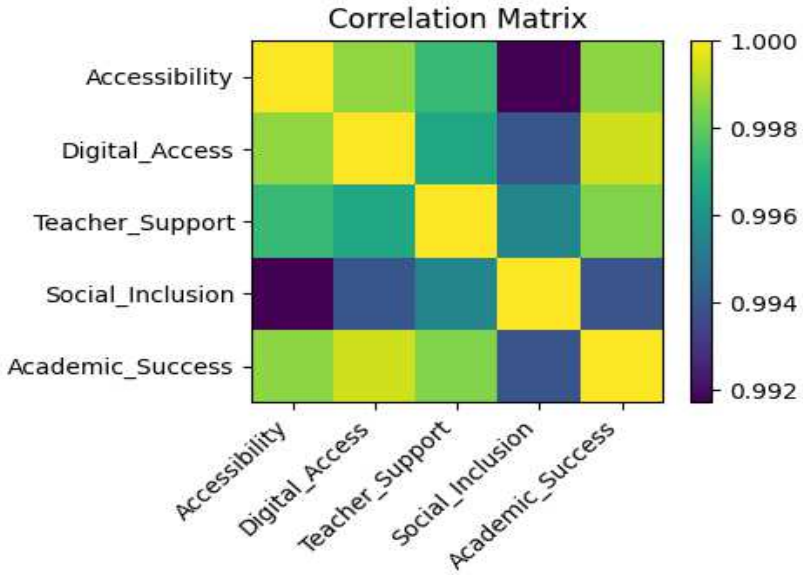
It can be seen from the graph that this university has the lowest scores recorded. It shows severe technological constraints lack of adequate digital assistance, poor availability of technologies for assistance and deprived educational opportunities for blind students. The graph shows that the students enrolled at this university will face serious problems in accessing digital study materials.

The graph reveals a clear positive relationship between digital accessibility and academic success. As digital accessibility increases, academic success also tends to increase. This means that universities with stronger ICT infrastructure, accessible digital platforms, assistive technologies and better internet access are generally record higher educational outcomes for visually impaired students.

The upward trend of the points visually confirms this positive association.

5.4. Correlation matrix

Figure 3. Correlation Matrix



Correlation matrix provides another evidence that teacher support, social integration, and access are interrelated factors in the educational experience of visually impaired learners in Cameroon state universities. In other words, a favorable change in any of the factors results in positive changes in the other factors, thus leading to mutual reinforcement. The findings indicate, therefore, that academic achievement of visually impaired learners cannot be attributed to a single factor but to the relationship between the three factors.

From the correlation matrix, it appears there is a strong positive relationship between accessibility and lecturer support. Those universities with robust accessibility structures have been seen to show better lecturer support and inclusive pedagogy. Universities that allocate money and resources to develop inclusive structures show greater institutional commitment towards people with disabilities; They are more inclined to train their lecturers in the principles of inclusive education; and such accessible settings make the lecturers apply adaptive approaches.

Moreover, there is an observable link between teacher support and social inclusion. It implies that when lecturers use inclusive teaching strategies; when teachers display positive attitudes towards disabilities; when participation in the classroom is promoted, there is a higher chance for blind students to feel socially included.

The factors associated with teacher support include student self-esteem, classroom participation, peer interaction and positive emotional states.

Often, lecturers affect how non-disabled students see their blind peers. The lecturer's positive attitude helps decrease any prejudice and creates a collaborative atmosphere in the class. On the other hand, ignoring the needs of visually impaired students by lecturers increases stigma.

This study shows that in universities, besides being instructors, teachers serve as social facilitators. Consequently, this strong link between teacher support and social inclusion proves the need for disability-inclusive pedagogy.

It is also evident from the correlation matrix that accessibility and social inclusion go hand in hand. An accessible campus and learning environment promotes mobility, participation in extracurricular activities, social interaction and independent learning. If visually impaired students are able to move around university campuses and access learning resources independently, they will feel motivated to take part in social activities, build peer relations, interact in academic discussions; and be socially inclusive. However, an inaccessible infrastructure tends to socially marginalize such students due to their inability to participate in academic and social activities. This proves that accessibility has psychological and social implications beyond mere mobility.

The findings from the correlation analysis reveal that academic achievement may be affected by the cumulative effects of accessibility, digital inclusion, teachers' support and social inclusion. Academic success in institutions where there are more supportive systems tends to be relatively higher among the visually impaired.

6. Discussion

The research reveals the existence of multiple factors that combine to form complex structures of structural, institutional, technological, and societal obstacles that impact visually impaired students' involvement in higher education programs and their academic achievements. It must be noted that these obstacles are not individual but interconnected and reinforce each other leading to compound discrimination, limitation of freedom and options, and poor education outcomes for visually impaired students.

One of the most significant findings made during the research process involves the ongoing existence of structural obstacles. Such obstacles are associated with environmental and institutional conditions that prevent students from participating equally. The findings show that many institutions lack adequate investment in developing inclusive environment and appropriate systems for supporting students with disabilities. Even though access to higher education in Cameroon increased, proper institutional measures ensuring inclusiveness are lacking.

In terms of structural factors, an important problem is the insufficiency of available assistive technology. Contemporary educational institution operates under the condition of increasing reliance on modern technology. Students need to use computer technology, electronic databases, communication platforms, and virtual learning environments. To engage effectively in this environment, visually impaired students require: screen readers; braille displays; audio learning systems; magnification software; and accessible electronic documents

Nevertheless, this research shows that many universities do not provide such technologies because of their budget restrictions, poor institutional planning, and low investment from the government sector. In some institutions, visually impaired students have to count on their peers or personal

strategies to obtain access to educational information. Technological disparities reduce educational independence and foster academic dependency.

Moreover, the results show that there are still significant deficiencies in terms of accessible infrastructure in several universities. The fact is that most universities were developed without taking into account the needs of disabled people. Therefore, many visually impaired students face obstacles in moving around lecture halls, libraries, administrative departments, and dormitories of the universities. Lack of tactile guidance systems, braille signboards, and orientation mechanisms restricts movement and makes participation in campus life difficult.

Thus, these restrictions in infrastructure create particular impacts on the educational process. Students are late for lectures, avoid using some facilities provided by universities, or undergo stress connected with difficulties in movement.

The other important structural problem highlighted by the study is the weakness in digital inclusion policies. While the trend towards digital learning systems continues to grow, not enough measures are taken to ensure that such systems are available to visually impaired students. Learning systems cannot support their functioning through assistive technology and academic resources cannot be easily accessed due to lack of accessibility of the material.

Such a "digital exclusion gap" became even more relevant as online learning systems became increasingly popular in today's education system. Without digital accessibility, a student will have limited opportunities to access lectures, research data bases, academic communication and learning possibilities provided by virtual environments.

In such a way, digital exclusion is an additional element contributing to inequalities in higher education for visually impaired students.

However, besides structural problems faced by visually impaired students in university contexts, there are also social barriers which make studying more difficult for them. Social barriers include all sorts of discrimination and stigmatization of disabled people which makes students' socialization process difficult.

7. Validation of the Research Hypotheses

The results of the research validate the research hypothesis, as they prove that institutional access support systems have a significant impact on educational performance. The research hypotheses can be validated in the following ways:

Hypothesis 1:
Access support in universities positively impacts the level of academic performance.

The results of correlation analysis prove that there is a connection between access systems and high levels of academic performance.

Hypothesis 2:
Digital access positively impacts educational inclusion and performance.

The connection between digital access systems and academic performance proves the positive effect of assistive and accessible technologies on learning.

Hypothesis 3:
Teacher assistance increases academic success as well as social inclusion.

Strong connection between teacher assistance and social inclusion proves the significant role of teachers in education.

Hypothesis 4:
Social inclusion positively impacts academic performance.

Peer social inclusion promotes better involvement in educational process.

8. Implications for Policies and Institutions

The correlation matrix has profound implications for educational policies and higher education institutions in Cameroon. It becomes evident that enhancing just one aspect of inclusive practices might not be enough. Inclusive education needs an institutional approach based on accessible infrastructures, assistive technology, inclusive teaching pedagogies, psychosocial support systems and non-discriminatory policies.

Thus, universities need to implement a holistic disability inclusion approach rather than fragmented interventions.

It also emerges that the educational inclusion is a multi-dimensional process; support structures are interactive in nature; inclusive education calls for a transformation on different levels.

9. Theoretical Interpretation

The findings strongly support the theoretical framework used for this research.

Social Model of Disability
It is proven by the findings that the disparities in education among students with visual impairments are mainly the product of institutional and environmental factors, but not disability per se.

Inaccessibility, poor teachers' training, and low social inclusion lead to an exclusionary environment for education.

Capabilities Approach

The results also support Capabilities Approach through the evidence showing that institutional support systems enhance students' opportunities, freedom, and capabilities. As universities offer:

Accessible teaching space;

Supportive lecturers;

Digital technology;

Inclusive social system;

students with visual impairment get more chances to succeed academically and socially at universities.

10. Conclusion

Overall, the study has shown that visually impaired university students in Cameroon face significant academic, institutional, and societal obstacles despite increasing global attention on education for all. While some universities have taken strides towards ensuring that there is improved access and educational inclusiveness, there are stark disparities among other universities in terms of their level of infrastructure, technology adoption, and commitment to including persons with disabilities in education.

The research has established that accessibility, digital inclusiveness, lecturers' support, and social integration are important factors in determining the academic performance of visually impaired students. Universities with better access infrastructure, use of assistive technologies, inclusive lecturing techniques, and good social environment are able to have more participation and academic success from students with vision impairments. Otherwise, universities with poor accessibility systems, insufficient digital resources, lack of lecturers' preparedness, and social exclusion create a learning environment that limits the potential of visually impaired students.

Further, it is important to point out that issues experienced by visually impaired students cannot be attributed directly to their visual impairment but can be largely blamed on institutional and social barriers. Such results provide evidence for the validity of the Social Model of Disability that states that discrimination and exclusion come from inaccessible environments and discriminatory structures of institutions. In turn, according to the Capability Approach, poor access to education and limited institutional support restrict students' freedom and opportunities for meaningful learning.

In addition, comparative analysis proves that institutions that show stronger commitment to providing accessible technologies have better inclusiveness and results from studying. It means that there is no doubt that the role of institutional governance in ensuring equal opportunities for students of different nationalities cannot be underestimated, since it plays a decisive part in creating conditions for equal learning opportunities.

11. Recommendations

From this research, there is a need for major reforms geared towards improving inclusive education for visually impaired learners within the universities in Cameroon. In this regard, the government needs to invest in adequate resources such as technology and infrastructure that will improve the lives of visually impaired learners within the institutions of higher learning. Screen readers, audio reading devices, Braille readers, tactile paths, accessible libraries, and other infrastructure are critical to enhancing the mobility and independence of visually impaired learners.

Furthermore, there is an urgent need for developing and enforcing national policies on inclusive education that address specific aspects of higher education institutions. It is apparent that although Cameroon has incorporated inclusive education practices within its education system, there are no policies regulating the inclusion of learners with disabilities within the universities.

The study also suggests the need to train lecturers and academic staff in the area of inclusive pedagogy and disability-specific teaching. The majority of lecturers today are not well equipped to educate visually impaired learners. It is recommended that universities regularly hold professional development programs focused on inclusive teaching strategies, accessible learning materials, inclusive testing, and student-focused pedagogies. Improved teacher preparedness will contribute to increased educational participation and achievement of visually impaired students.

Also, it is important for universities to improve digital accessibility through enhanced access to assistive devices and technology-enabled learning solutions. Modern institutions must ensure that their e-learning facilities, websites, library, documents, and resources are accessible to disabled students using a variety of devices, including Braille and screen readers. In recent years, accessible digital environments have become increasingly important in higher education and have emerged as significant determinants of educational equity.

Last but not least, it is crucial to establish a dedicated disability support center within each of the state universities. Such institutions would offer academic and psychological counseling, technical assistance, advocacy services, and coordination of disability-related initiatives.

Statements and Declarations

In preparing this thesis, the author used Deepseek to obtain assistance with linguistic revision and proofreading. After using Deepseek AI, the author reviewed and revised the content as necessary and assumed full responsibility for the content of the publication.

Conflict of Interest

The author declares that there are no competing interests or conflicts of interest that could have influenced the work reported in this paper.

Ethical Approval

All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of academic research in the social sciences. The research respected the principles of confidentiality, anonymity, and voluntary participation.

Informed Consent

Informed consent was obtained from all individual participants included in the study. Participants were informed about the purpose of the research, the use of the data collected, and their right to withdraw from the study at any stage without any negative consequences.

Data Availability

The datasets generated and analyzed during the current study are not publicly available due to confidentiality considerations but are available from the author upon reasonable request.

Author Contributions

The author was responsible for the conception and design of the study, data collection, data analysis and interpretation, as well as the drafting and revision of the manuscript. The author has read and agreed to the published version of the manuscript

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