

Analysis of Academic Facilities and Their Influence on the Academic Performance of Students

Rimsha Khalid¹ and Neelam Farid²

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Abstract

This study investigates the influence of academic facilities on the performance of university students in Islamabad, with data collected from 385 social sciences students across four institutions: International Islamic University Islamabad, Quaid-i-Azam University, Bahria University, and Air University. Using a quantitative approach, the research examined classroom infrastructure, ICT resources, co-curricular activities, and technology-based tools. Findings reveal strong positive correlations between academic performance and classroom infrastructure ($r = 0.730$, $p < 0.01$), co-curricular participation ($r = 0.713$, $p < 0.01$), and ICT resources ($r = 0.685$, $p < 0.01$). These results confirm that well-equipped classrooms, functional digital libraries, e-learning platforms, and extracurricular opportunities significantly enhance motivation, engagement, and achievement. The analysis also highlights disparities between public and private universities: while public institutions show stronger library provisions, private universities offer more advanced ICT and recreational facilities. Such imbalances point to inequities in learning opportunities, underscoring the need for balanced resource allocation. Overall, the study demonstrates that student-centred and technologically advanced facilities not only improve academic outcomes but also contribute to equity and inclusion in higher education. These findings provide practical implications for policymakers, administrators, and educators, emphasizing investment in infrastructure, balanced resource distribution, and sustainable facility management to foster student success.

Keywords: Academic Facilities, Student Performance, Classroom Infrastructure, ICT Resources, Co-curricular Activities, Social Capital Theory.

Introduction

There are permanent and semi-permanent structures constituting the academic facilities. Such structures are labs, classrooms, libraries, and equipment. Besides creating a conducive learning environment, such facilities promote student involvement. In line with the research findings, well-maintained and equipped facilities are positively influencing the results of students; on the contrary, undersupplied facilities may have an adverse effect on academic achievement. Student success also depends on these factors in addition to classroom design, air quality, and building conditions. Moreover, the maintenance and management of academic facilities is of the essence so that they are able to support the fulfilment of learning goals effectively. Hanaysha et al. (2023) believe that educational facilities can make informed decisions to enhance the quality of the learning environment and promote academic excellence when they have a good understanding of the relationship between academic facilities and student performance.

There is an obvious direct relationship between academic facilities that constitute the infrastructure of the educational system and teaching and learning quality. The buildings

¹Visiting Faculty Member, International Islamic University Islamabad. Email: raja.rimsha311@gmail.com

²Assistant Professor, International Islamic University Islamabad. Email: neelam.farid@iiu.edu.pk



consist of classrooms, laboratories, libraries, relaxing and studying sites, and contribute to playing a pivotal role in shaping the academic career that students choose for themselves. When students are given a chance to participate in contemporary labs that are well-equipped, they have chances to engage in practical and hands-on experiences, which helps them understand the theoretical subjects better. Meanwhile, modern libraries offer their clients access to an enormous number of materials needed in order to do research and obtain information. The introduction of the latest technical facilities in classrooms, like interactive learning technology, smart boards, and stability of internet connectivity, further enhances the extent of student engagement and accommodates novel methods of instruction. Students get a chance to collaborate better, experiment with digital tools, and interact with instructional resources in a manner that is not available with traditional ones (Hanaysha et al., 2023). It is in such facilities that students can do all these.

Environmental factors within academic buildings, including illumination, air quality, and temperature, are other factors that will affect comfort levels and concentration of students. These are on top of the physical buildings that are present. It has been identified through study that bad indoor air or inadequate light can affect cognitive performance negatively, and lead to diminishing concentration and not being able to get information in. On the one hand, classrooms that are designed well and have sufficient ventilation, lighting, and acoustics create an environment that is friendlier to studying, which consequently helps improve concentration and reduce fatigue. There exists a relationship between the overall condition of a building (e.g., clean, well-kept, visually pleasing) and the mentalities that children have concerning school attendance. Students can also acquire a sense of pride and responsibility when they are exposed to a clean, well-organized, and well-maintained facility. This could motivate students to be serious about their studies. Conversely, failing or obsolete facilities can convey to students the idea that education is not a priority, further affecting their motivation and performance in general (Hanaysha et al., 2023).

The routine maintenance and the overall strategic management of academic facilities are a very crucial element towards the smooth running of educational objectives. This is besides the physical and environmental qualities of the facilities. Facility management is more than maintenance of the physical condition of the buildings; it also includes the regular modernization of the technical equipment, the replacement of the worn-out equipment, and the assurance that all parts of the institution are accessible to students with various needs. This is done by providing facilities with respect to the accessibility requirements of students with impairments, hence fostering inclusion and equality in the learning environment. Proper facilities management practices also ensure that the available resources are utilized to the maximum, and as such, avoid hiccups in learning created by poorly running machinery or outdated resources. Consequently, because these institutions establish environments where students feel motivated and inclined to achieve high performance, universities that invest in the continuous reconstruction and maintenance of their buildings will have a better chance of experiencing increased levels of student happiness, engagement, and academic outcomes (Hanaysha et al., 2023).

Problem Statement

The connection between academic facilities and student academic performance is known, but in the area of educational research, many gaps still exist in the aspect of what and how specific components of these facilities, especially, contribute to student academic performance. The majority of available research has focused on general issues (such as what facilities are adequate, how they should be maintained, and generally what conditions they are in), neglecting more detailed dimensions (the design of classrooms, how effective learning spaces are, access to technological infrastructure, and academic resources). These components, though

critical to the development of the learning environment, have not been given much consideration in their individual and collective effects on student learning outcomes. This study aims to fill this research gap by examining the effects of specific attributes of the academic facilities and the performance of academic students. It dwells upon the interaction between the classroom design, technological infrastructure, and the resources, and the influences they exert on student activities, behaviors, and academic success. The study of this nature will allow it to develop practical recommendations that educational organizations, facility administrators, and policymakers can use to better develop infrastructure in ways that facilitate learning and academic achievement (Hanaysha et al., 2023).

Significance of the Study

The importance of this work to the study of academic facilities and how they affect the academic performance of the students is that its results and findings can present evidence that can be used to help direct educational institutions in a more innovative way of allocating their resources, planning new infrastructures, and managing the facilities they have that will help them improve on how well their students perform. By finding certain traits of academic structures- classroom design, technology support, and the availability of learning resources that have the most significant influence on student outcomes, universities can make strategic choices that will create the conditions that are favorable towards effective teaching and learning. This is not only an improvement in academic performance but also a greater issue of student engagement, retention, and the excellence of the institution. Moreover, the research speaks to the matter of educational equity as it examines the situation of inequality in learning conditions by highlighting the impact of the conditions of facilities, their maintenance, and accessibility on the results of learning, and directs the work on eliminating the gaps in the quality of the institutions. In the era of changing paradigms of education and technological progress, the findings can be used to bring academic settings closer to the demands of contemporary learners. Outside the academic context, the study has broader policy-making implications on workforce development and national competitiveness since these enhanced facilities in academic institutions will help in producing graduates who have the skills and competencies that are needed in the current labor market. These results validate the development of realistic, scalable policies to guide policymakers, administrators, and educational leaders who would like to consider equitable, innovative, and effective learning environments.

Objectives of the Study

1. To investigate the nature and availability of facilities provided by public and private universities.
2. To analyze the association between Academic facilities and the students' academic performance.

Research Hypotheses

1. There is an association between classroom infrastructure and students' academic performance.
2. There is an association between library resources and students' academic performance.
3. There is an association between co-curricular activities and a student's academic performance.
4. There is an association between e-learning ICT and students' academic performance.

Literature Review

The facilities available to the university students greatly determine their academic success. As it can be stated according to the research provided by Alwagait et al. (2015), there exists a

positive correlation between the accessibility and adequateness of physical amenities, e.g., classrooms, libraries, and dorms, and the academic achievement of a student. In a similar manner, Earthman (2002) discovered that properly maintained facilities have positive effects on the capability of students to concentrate and learn. Besides, the classroom environment also affects the academic performance of pupils, which includes factors like comfort and contentment (Uline & Tschannen-Moran, 2008).

Also, through information and communication technology (ICT) resources (Montiel-Overall & Hernandez, 2012), teacher competence, academic performance, and student engagement are enhanced. Also, as the study conducted by Ali et al. (2016) found out, the use of electronic devices during lectures as well as during study time may have an adverse effect on academic performance, with laptops showing a significantly adverse effect compared to tablets or smartphones. The management of schools and the improvement of their infrastructure are significant in terms of supporting the academic performance of learners (Gopal et al., 2021; Schneider, 2016).

The performance of students is greatly influenced by the facilities they have in their learning rooms. A study undertaken by Aquilina (2016) has revealed that academic achievement is significantly impacted by the adequacy and the sufficiency of physical/material facilities, including, but not limited to, the number of classrooms, information and communication technology resources, and libraries. On the same note, Barrett et al. (2019) have stressed that up-to-date classrooms that are adequately lighted, adequately ventilated, and properly-seated imply the best learning conditions. The learning environment, consisting of the conditions of the classroom and the comfort level, may equally influence the degree of happiness and academic performance of students (Filardo et al., 2019).

Moreover, the organisation of classrooms, libraries, and e-learning tools can have a direct impact on the academic achievements of the students (Bates, 2015). This forms an indication of the importance of properly designed and maintained facilities in educational institutions. As Iqbal et al. (2015) observe, universities need to ensure that well-maintained and well-equipped facilities are provided to make sure that student success can be promoted and academic achievement can be enhanced (Wilkinson & Kemmis, 2015).

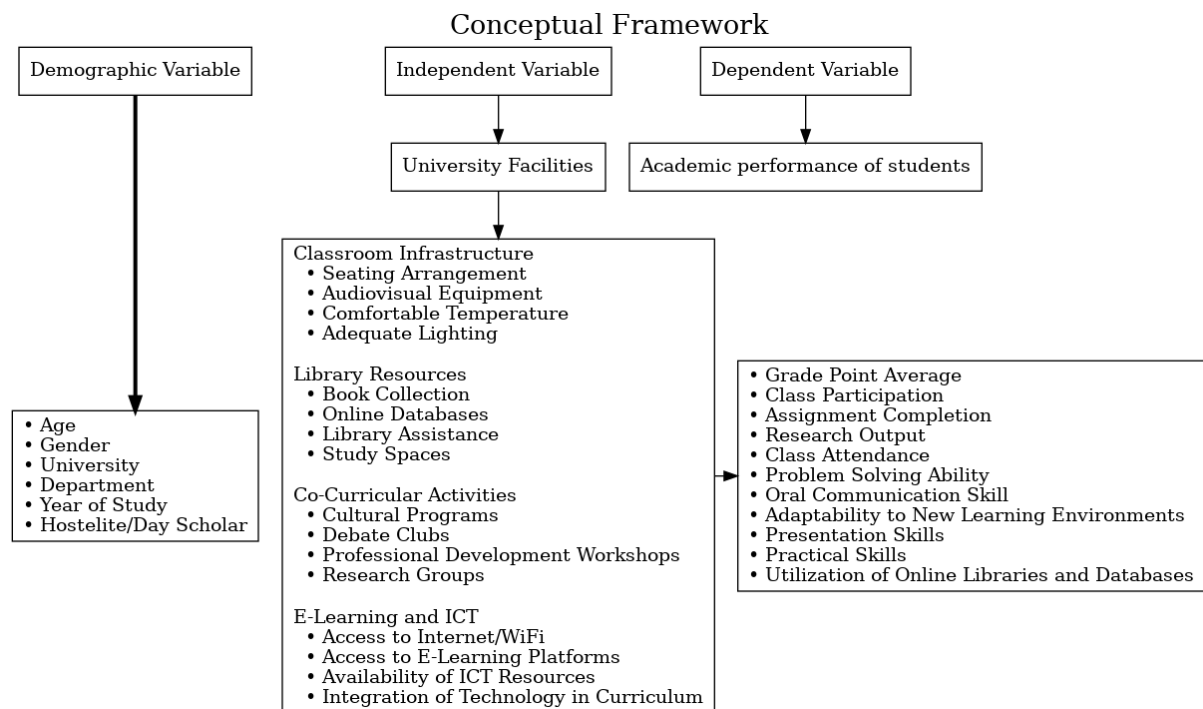
Theoretical Framework

In this research, the concept of Social Capital Theory is used to study how academic facilities can be seen as a vital institutional resource that could positively serve the academic achievement of students. Social capital, in the manner in which it is defined by Coleman (1988) and Putnam (2000), is the networks, norms, and resources within any given social structure that people can access and use to their personal and communal advantage. At the educational-institute level, good libraries, study rooms, and laboratories are forms of social capital that support the cultural accumulation of knowledge by making knowledge, collaboration, and learning facilitating systems available to students, and students can accumulate cultural capital (Bourdieu, 1986; Lin, 1999). These materials not only make the individual efforts of students more successful but also become the shared resources that stimulate their academic engagement and motivation. Spaces that facilitate communication and knowledge sharing, like group work environments and technology-aided environments, have the potential to foster the formation of peer support networks that enhance the learning process outcomes and, overall, academic performance (Broadbent & Poon, 2015; Stewart et al., 2015).

Moreover, Social Capital Theory can serve as an instrumental tool in the discussion of educational inequality, as it defines how access to academic facilities may generate inequality in academic performance. Learners in schools with fewer resources or those that are not well maintained may struggle to access the resources and support systems needed to ensure they succeed in academics, entrenching structural disadvantage (Coleman, 1990). The theory gives

a platform to evaluate how changes in social capital affect educational performance by comparing the academic environments with different levels of developed facilities. Such a comparative approach is essential to help make equitable infrastructure investments and address the concern that not all students, regardless of institutional affiliation or socioeconomic status, are served by facilities that promote learning. In summary, the use of Social Capital Theory in this case highlights the fact that academic facilities should not be looked at as mere property; instead, they should be an addition to the setting that fosters academic success and fairness in the institution (Waheed et al., 2020).

Figure 1: Conceptual framework



Research Methodology

This paper has utilized the quantitative cross-sectional research design in order to study the effects of academic facilities on academic performance of the students. Positivist research philosophy was chosen, which focused on the objective, measurable evidence and statistical analyses aimed at determining the correlation between the physical academic resources and student outcomes. The participants included undergraduate and postgraduate students of Social Sciences in four universities in Islamabad- two public (Quaid-e-Azam University and International Islamic University Islamabad) and two private (Bahria University Islamabad and Air University). After stratifying the population in terms of university type, a stratified random sampling method was used to draw a representative sample of 385 students out of a total population of 10,700 as were determined using the Taro Yamane formula with a margin of error of 5 percent. A standard questionnaire was used as the main source of data collection, which includes closed-ended and Likert scale questions in three parts: demographic, academic facilities, and student performance.

Data was gathered within two weeks by using in-person survey, as well as an online self-administered survey. Key constructs achieved operationalization as academic facilities were defined as institutional resources including classrooms, libraries, laboratories, ICT resources, hostels, and transportation, as well as e-learning platforms, and co-curricular activities, and academic performance as indicators that could be quantified, whether grades, test scores, and

self-reported academic engagement. The data were summarised using univariate analysis-based on frequencies, means and standard deviations-and bivariate analysis-which incorporates Pearson correlation and linear regression of the types of academic facilities and the academic performance outcomes. Such statistical methods enabled the research to find important associations and adjust for confounding factors so that the results are robust and generalizable such that they clearly represent the academic environment in various higher education institutions in Islamabad.

Data Analysis and Interpretation

Table 1: Correlations Between Classroom Infrastructure and Student Academic Performance

Variable	Classroom Infrastructure	Student Academic Performance
Classroom Infrastructure	1.000	0.730**
Sig. (2-tailed)		0.000
N	385	385
Student Academic Performance	0.730**	1.000
Sig. (2-tailed)	0.000	
N	385	385

Note: Correlation is significant at the 0.01 level (2-tailed).

Pearson correlation reveals a very strong and significant relationship between classroom infrastructure and student academic performance ($r = 0.730$, $p < 0.01$) and hence improved classroom conditions correlate closely with better academic performance (Pallant, 2020; Field, 2018). This indicates that improved seating, light, technology and environment increase the performance of students (Bryman & Cramer, 2012; Tabachnick & Fidell, 2019). The level of significance ($p = 0.000$) demonstrates that the finding can be considered reliable, and sample size (385) helps prove that the result is valid and can be generalized (Hair et al., 2019). These results reveal how much classroom infrastructure is important in achieving academic success and how essential it is that the institutions should pay attention to improving their facilities.

Table 2: Correlations Between Co-Curricular Activities and Student Academic Performance

Variable	Co-Curricular Activities	Student Academic Performance
Co-Curricular Activities	1.000	0.713**
Sig. (2-tailed)		0.000
N	385	385
Student Academic Performance	0.713**	1.000
Sig. (2-tailed)	0.000	
N	385	385

Note: Correlation is significant at the 0.01 level (2-tailed).

According to Pearson correlation analysis, there exists a high and statistically significant positive relationship between co-curricular activities and student academic performance ($r = 0.713$, $p < 0.01$), which suggests that, the higher the degree of participation in co-curricular activities, the higher the level of academic performance (Pallant, 2020; Field, 2018). This implies that involvement in extracurricular activities like debates, cultural activities, sports,

and workshops helps refine some important skills, among them, communication, critical thinking, and time management, all of which are essential to academic achievement (Bryman & Cramer, 2012; Tabachnick & Fidell, 2019). The level of significance ($p = 0.000$) proves the soundness of this correlation, and the number of respondents (385) ensures that the findings are general competent (Hair et al., 2019). These findings reinforce the notion of incorporating co-curriculum into academic settings as it supplements formal education and leads to a more well-rounded student, and such a student is more academically successful.

Table 3: Correlations Between E-Learning and ICT and Student Academic Performance

Variable	E-Learning and ICT	Student Academic Performance
E-Learning and ICT	1.000	0.685**
Sig. (2-tailed)		0.000
N	385	385
Student Academic Performance	0.685**	1.000
Sig. (2-tailed)	0.000	
N	385	385

Note: Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation test results reveal that there exists a positive and statistically significant relationship between the use of E-Learning and ICT resources and student academic performance ($r = 0.685$, $p < 0.01$), and, therefore, when there is more access to digital tools and platforms, the academic performance of students will be more significant (Pallant, 2020; Field, 2018). This implies that working internet, efficient e-learning environments, and sufficient technical assistance have a significant influence on the active learning process and the success of students (Bryman & Cramer, 2012; Tabachnick & Fidell, 2019). The value of significance ($p = 0.000$) indicates that this correlation is solid, and a sample size of 385 supports the reliability and generalizability of the results (Hair et al., 2019). These findings emphasize the great importance of E-Learning and ICT infrastructure in establishing an effective and convenient learning environment, and reiterate the necessity of educational institutions in investing in technological advancement to foster effective performance by students.

Discussion

The findings of this study affirm the central role of academic facilities in shaping student performance and engagement in higher education. Correlation analyses revealed strong positive associations between classroom infrastructure, ICT resources, co-curricular activities, and academic outcomes. These results emphasize that physical and digital learning environments are not passive backdrops but active contributors to student achievement. For instance, the strong link between classroom infrastructure and performance ($r = 0.730$, $p < 0.01$) underscores the importance of ergonomic design, lighting, and technological integration in facilitating concentration and learning efficiency. This aligns with Barrett et al. (2019), who argue that well-designed classrooms foster student motivation and reduce cognitive fatigue. From the perspective of Social Capital Theory, academic facilities act as institutional resources that foster networks, norms, and shared learning opportunities (Coleman, 1988; Putnam, 2000). Access to libraries, ICT labs, and co-curricular spaces enhances collaboration, peer support, and collective knowledge-building, which in turn elevates academic performance. Conversely, disparities in facilities across public and private universities point to structural inequalities that limit students' access to these forms of social capital. As Bourdieu (1986) suggests, inequitable

distribution of cultural and institutional capital entrenches differences in student success, a pattern visible in the observed institutional variations in ICT and library resources.

The positive association between co-curricular activities and academic performance ($r = 0.713$, $p < 0.01$) reinforces theories of holistic education, where skill development in communication, leadership, and critical thinking extends beyond classroom learning. This supports the view of Broadbent and Poon (2015) that extracurricular engagement cultivates self-regulated learning strategies, enhancing both academic and personal development. Similarly, the strong link between ICT and e-learning resources with academic achievement ($r = 0.685$, $p < 0.01$) aligns with theories of digital learning environments, where technological access reduces barriers to knowledge. It fosters equitable participation (Waheed et al., 2020).

The results also reveal an imbalance in facilities between public and private universities. Public institutions performed better in library facilities, while private institutions excelled in ICT and recreational resources. This divergence highlights the differing priorities of institutional governance and reflects Earthman's (2002) assertion that unequal resource allocation perpetuates disparities in educational outcomes. From a theoretical standpoint, these findings indicate that while academic facilities expand opportunities for building social and cultural capital, unequal access can perpetuate systemic inequities in higher education.

In sum, the study validates the theoretical claim that academic facilities are not merely infrastructural assets but essential components of the social and cultural ecosystem of higher education. Their influence extends beyond immediate academic performance to broader goals of equity, motivation, and long-term educational success. Therefore, policymakers and administrators must view investment in academic infrastructure as both an educational and a social justice imperative.

Conclusion

The findings of this study carry heavy implications for the university administrators, politicians, and educators who would like to enhance the quality of academic settings in order to improve the outcomes of students. The study would present an incentive to administrators of the universities to invest in the management, maintenance, and updating of the academic facilities. Moreover, equal access to digital resources, i.e., information and communication technology (ICT) tools and online learning platforms, is also instrumental, especially considering that technology is becoming an increasingly important aspect in the sphere of education. Educational institutions should close the digital gap by providing all students, regardless of their socioeconomic backgrounds, with access to these resources in a reliable way.

To the interest of policymakers, the study illuminates the structural inequality between the public and the private institutions in terms of resource allocations. These disparities must be eradicated as much as possible to develop a higher educational system that is inclusive and egalitarian. To empower under-resourced schools to match the universities receiving sufficient funds and compete on equal terms, policymakers are supposed to initiate the development of funding models that would give priority to such schools. Also, the findings demonstrate the importance of conducting long-term planning and designing maintenance approaches that are sustainable to ensure that the existing facilities will remain functional and relevant in the course of time.

The impacts on the educators were in coming up with better teaching practices through the Utilization of the capabilities that are now available. The involvement of students and their critical thinking can be facilitated through the introduction of active learning in a classroom, as well as through the stimulation of using digital resources. Not only should recreational and common areas be considered as an important part of holistic education, but they should also be defined as the places providing students with a chance to rest and develop their interpersonal

abilities. Taken individually, all these effects require an intensive effort on the part of multiple stakeholders in collaboration to create academic environments that give students the support and inspiration to achieve their full potential.

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