

Social Return on Investment of Public Sector University Buildings in Low-income Countries: A Case Study in Afghanistan

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Abstract

Investments in public higher education infrastructure in low-income countries have declined, driven by concerns regarding financial returns and a failure to properly consider social outcomes in project appraisals. This study presents a practical assessment of the Social Return on Investment (SROI) of public-sector academic buildings in low-income countries, addressing a gap in previous research examining the impact of such investments. Specifically, an SROI methodology was applied to analyse three public university buildings in Afghanistan. Based on primary data gathered from 49 stakeholders via in-person interviews, the study monetised the main elements of the SROI formation process, using a change model analysed across six stages, including one sensitivity scenario. The findings indicate that Building II, with an SROI of 1.13, is the most resilient investment, whereas Building I is not viable, and Building III is highly volatile. The analysis suggests that maximising the value of public academic infrastructure in low-income countries requires flexible, demand-driven usage, operational stability, and the capacity for service maintenance under varying conditions. Furthermore, the findings demonstrate that such investments can generate measurable social and academic value that justifies continued funding. Finally, this study, despite specific limitations requiring future research, offers theoretical, methodological, and practical contributions to reframing public higher education infrastructure as a value-generating asset rather than a cost centre.

Keywords: impact assessment, public sector universities, physical infrastructure, social values, SROI

1 Introduction

The adequate operation of public higher education institutions depends on the availability of educational facilities (Muhammad et al., 2014), including physical infrastructure, which is a key requirement for excellence and a fundamental support for high-quality outcomes, staff productivity, and student motivation. While an acute shortage of academic buildings prevents large numbers of students in most low-income countries from acquiring necessary skills (Mitchell et al., 2017; Kang et al., 2020), and government budgets are too limited to compensate for the cost of such infrastructure (McNerney, 2009; Lapovsky, 2014; Aithal & Aithal, 2019), overall investment in public-sector higher education, including relevant physical infrastructure has, been declining (Figures 1, 2). This decline is driven by concerns regarding economic returns and value for money (Blank & Tarquin, 2008; Leaman et al., 2010), with such investments often viewed as consumption or a waste of resources

(Skorup, 2013). Figures 1 and 2, based on World Bank and UNESCO data (UNESCO, 2025), demonstrate the trends in education sector spending (including the higher education sub-sector and its physical infrastructure) in selected low-income countries. The spending percentages in most countries are exceptionally low, even at their peak, and for most, they show a declining trend.

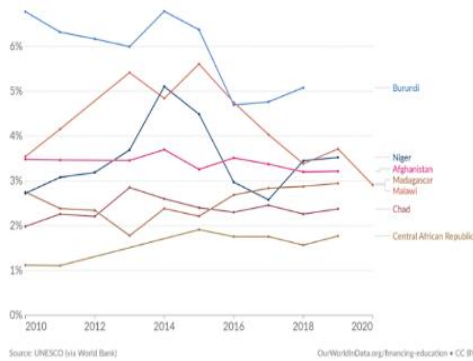


Figure 1. Public spending on education as a GDP share in low-income countries, (UNESCO, 2025)

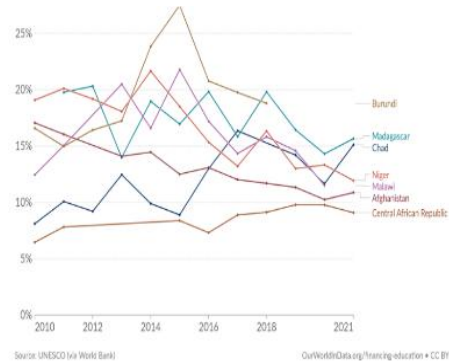


Figure 2. Education spending as a share of total government expenditure in low-income countries, (UNESCO, 2025)

While traditional measures focus on direct financial outcomes, Siegfried et al. (2007) and Alghamdi et al. (2022) argue that public infrastructure impacts cannot be fully captured without accounting for indirect social benefits. Acharya (2010) further supports this by highlighting social returns as a better measure of investment performance in non-profit settings, while Bromilow and Pawsey (2013) stress the importance of incorporating long-term social value in evaluations. Consequently, Shirazai (2018), Casalini (2018), and Muravska et al. (2020) advocate for normalising higher education investment levels by controlling for the social return on investment.

Nevertheless, most Social Return on Investment (SROI) studies in the built environment are conducted in developed nations, leaving a research gap in the practical application of this method in low-income countries, particularly concerning physical infrastructure in public-sector universities. While Watson et al. (2016) applied the SROI method to investigate the influence of social values on the physical design of healthcare buildings, the work of Patrinos and Psacharopoulos (2020) on social and private returns to higher education does not address physical infrastructure. Kordi et al. (2021) introduced seven social sustainability attributes into the construction project life cycle, focusing on the operation phase to assess impacts and involving end-users as key stakeholders for long-term assessment. However, they recommended further empirical studies to analyse the effective implementation of the social dimension. Furthermore, subsequent work by Kordi et al. (2022) merely mapped these attributes to sustainability assessment tools in construction, serving as an indication of the limitations in the existing literature.

This study is distinct in its focus on the practical assessment of the social return on investment (SROI) of academic buildings, conceptualising them as part of broader resource outcomes within faculties. It applies standard SROI methodology to three faculties at a public university in a low-income country. This section defines key concepts used throughout the study to ensure clarity.

Descriptions of the key concepts

Economic efficiency refer to the requirement to make economic sense (Leaman et al., 2010), providing the required value at the lowest cost, lowering the income tax through depreciation (Blank & Tarquin, 2008), reducing the costs (Okolie, 2011), and generating direct or indirect, social or economic returns.

Impact assessment refers to evaluating the profitability or economic sustainability of a public academic building by considering its social benefits (Keppell & Mathew, 2012). It is not an easy process (Casalini, 2018) because of the complicated relationships between buildings and students' achievements (Ramli & Zain, 2018), building and graduates (Watson, 2016), and building and users. The suggested ways to simplify the process include using social indicators containing qualitative standards instead of challenging social elements (Finkbeiner et al., 2010); assessment at the pre-, during, and post-investment stages (Casalini, 2018); using a six-stage procedure (Maldonado & Corbey, 2016); and the SROI method (Watson, 2016).

Low-income countries are nations with a Gross National Income (GNI) per capita of \$1,135 or less (as of 2024, for the 2026 fiscal year) calculated by the World Bank Data Help Desk. These nations often suffer from high poverty, low human capital, and heavy reliance on primary agricultural sectors, often with unstable economies poor infrastructure, limited budgets, and a high need for efficient, high-impact investments (World Bank, 2026).

Outcome monetisation means giving monetary units to non-monetary or non-market returns to enable the assessments of most public programmes, (Nicholls, 2020). It is performed using either by the outcome indicators (Cabinet Office, 2009), and financial proxies (Stadtman et al., 2017; Perrini et al., 2021), or alternative approaches such as stated preference, the contingent valuation (Kousky et al., 2019), district choice, and the housing market method.

Public sector university buildings are physical expressions of the complex social and economic factors that give structure and life to the public higher education community (Ampofo & Peprah, 2020), within which happen most university activities and core functions occur (Okechukwu et al., 2020).

Social Return on Investment (SROI) is an outcome-based measurement tool for planning, monitoring, and evaluating projects, quantifying impacts, attracting investments, and measuring an investment's success in a non-profit organisation (Lombardo et al., 2019). It measures the value of benefits relative to the costs of achieving those benefits, resulting in a ratio of the net present value of benefits to the invested resources; for example, 3:1 indicates that an investment of \$1 delivers \$3 in social value (Singh & Kumar, 2017).

$$\text{SROI} = \text{Net Present Value of Outcomes} / \text{Net Present Value of Investment} \quad (1)$$

Patrinos and Psacharopoulos (2020) report the social returns to higher education in low-income countries as 13.2%, which may be an equivalent value of 0.132 or 0.132:1. The stages of the SROI method are: i) establishing scope and identifying key stakeholders; ii) mapping outcomes; iii) evidencing outcomes and giving value; iv) establishing impact; v) calculating the SROI; and vi) reporting (NEF, 2008; Watson, 2016).

The change process in formation of the SROI is a concept of the hypothesized links among *inputs* (investments), *process* (project), *outputs* (tangible products), *outcomes* (changes to people), and *impacts* (the differences made by the project) (Moron & Klimowicz, 2021; Lombardo et al., 2019). Impacts are assessed by considering *deadweight*, or the proportion of the outcome that happens anyway; *attribution*, or the proportion of the outcome caused by other contributors; *displacement* of other negative outcomes elsewhere; and *drop-off*, or a measure of how long outcomes last (NEF, 2008; Cabinet Office, 2009). These counterfactuals are calculated using the survey data or as the percentages removed from the financial proxies (Watson et al., 2016). In the absence of accurate information, it is acceptable to round estimates to the nearest 10% (NEF, 2008).

2 Research Method

2.1 Research Design

This study employed a qualitative case study design to examine whether investments in physical infrastructure at a public higher education institution generate positive returns. Utilising an evaluative Social Return on Investment (SROI) framework, the study follows a six-stage method to quantify the retrospective social, economic, and environmental value generated by three academic buildings at Balkh University, Afghanistan. Moving beyond narrow cost-benefit analyses, this approach engages key stakeholders, including students, faculty, and the surrounding community, to capture, quantify, and monetise the broader educational and socio-economic outcomes five years post-construction, drawing on structured interviews and data summarised in Figure 3 and Table A.2. By comparing these outcomes to annual building-related costs, the study calculates a practical SROI ratio, providing robust empirical evidence to justify public spending on higher education infrastructure and demonstrating its role as a catalyst for human capital development and long-term socio-economic growth in low-income regions.

Figure 3 visualises the research design based on the SROI method developed by Sharif et al. (2025). It outlines the sequence of stages, starting with the research question and ending at the investment evaluation point. The third stage is detailed through sub-steps and outcome monetisation options based on the types of outcomes.

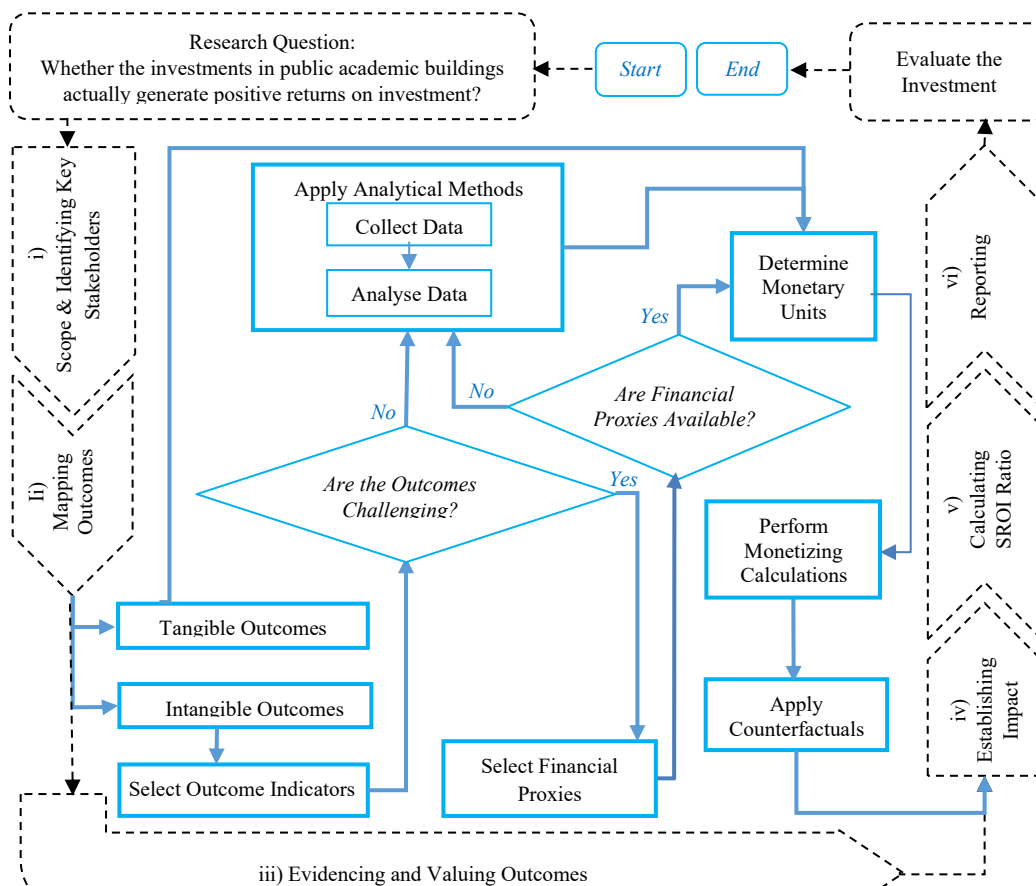


Figure 1. Research design based on the SROI method (Sharif et al., 2025)

2.2 Theoretical Framework

Grounded in the intersection of educational economics and public management, this study utilises three primary theories to reframe physical infrastructure as a value-generating asset rather than a sunk cost. First, public value theory posits that public-sector universities exist to create societal value, shifting the perception of academic buildings from 'consumption or waste' to essential drivers of social outcomes. Second, human capital theory suggests that investments in educational infrastructure are critical tools for cultivating skilled labour. Finally, infrastructure productivity theory asserts that adequate infrastructure functions as a fundamental productive input, enhancing organisational output and increasing the efficiency of academic staff and student learning. By synthesising these theories, this study argues that robust physical infrastructure provides an enhanced learning and working environment that facilitates high Social Return on Investment (SROI) value creation. By integrating these theories, the framework employs the SROI methodology as a measurement bridge to quantify the tangible and intangible outcomes of building investments. This translates results into a holistic "value for money" metric, justifying continued funding amidst limited government budgets. Figure 7 visualises the alignment of the theoretical context with the standard change process stages. Furthermore, it illustrates the relationships between the main elements within each stage (left-to-right arrows) and the feedback path for investment decisions (dashed right-to-left arrows).

2.3 Participants

Since the SROI method is based on the theory of change and is stakeholder-driven, the selection of research participants must be consistent with these requirements. According to Kordi et al. (2021), the most significant impact of any project occurs during its operational phase, when building end-users are directly affected. In this study, all stages of the SROI process are aligned with the operational phase of the academic buildings' life cycle, with the primary stakeholders being end-users, such as students, alumni, department heads, faculty deans, professors, and administrative staff. Therefore, 49 end-user stakeholders from three case buildings relevant to the study time frame (2018–2022) were selected through convenience sampling. The categorisation of participating stakeholders, their numbers, and their association with the case buildings are detailed in Table A.1.

2.4 Materials/Measures

A structured questionnaire was employed to improve the effectiveness of the interviews, with the format demonstrated in Table A.2. The questionnaire was divided into four sections: quantitative values, qualitative values measured by Likert scales (e.g., Very Low = 0%, Below Average = 25%, Average = 50%, Above Average = 75%, Very High = 100%), comments on overall experiences regarding the SROI elements, and case-building information. To avoid respondent fatigue, the number of elements to be evaluated was limited to 25. This limitation was necessary because each element required a five-year evaluation, involving the review of multiple document packages and careful recollection of past situations. Finally, the questionnaire was translated into the Dari language to facilitate communication with different stakeholders.

2.5 Procedure

The research procedure was carried out by following 6 steps of the SROI method.

2.5.1 Establishing Scope and Identifying Key Stakeholders

Selected three academic buildings operating in Balkh University, Afghanistan that is a public university. The time frame for the historical data was from 2018 to 2022, (**Table 1, Figures 4, 5, 6**). The main targeted stakeholders included 49 persons (**Table A.1**).

Table 1. Case buildings information

Case building	Building Title	Base Area (m ²)	Number of floors	Capacity for students*	Donor agency	Handover year	Total Project Cost (\$)	# of Faculties*
I	Academic Building of Engineering Faculty	4428	5	5008	Government of Pakistan	2013	11000000	6
II	Academic Building of Economics Faculty	2324	4	2246	Government of Afghanistan	2016	3100000	2
III	Academic Building of Public Administration Faculty	2324	4	2024	GIZ-Germany	2015	4500000	2

* Estimated considering both morning and afternoon classes; ** Different faculties (schools) operating in the academic building



Figure 4. Engineering Faculty Building



Figure 5. Public Administration Faculty Building



Figure 6. Economics Faculty Building

2.5.2 Mapping the Outcomes

The main contributing and detracting elements to the outcome were identified through a literature review and experts' opinions, then summarized in **Table 2**.

Table 2. Main contributing and detracting elements to the outcome

No.	System Elements	Units	Sources
1	Students in Day-Shift (Bachelor)	#	(Barrett et al., 2015)
2	Students in Night Faculty (Bachelor)	#	(Barrett et al., 2015)
3	Graduation from Day Shift	#	(Kelly & Mcnicoll, 2011), (Hodges et al., 2021)
4	Graduates from Night Faculty	\$	(Barrett et al., 2015)
5	Income from Tuition Fees	\$	(Conlon et al., 2018)
6	Savings in Building Rents	\$	(Garrido-yserte & Gallo-rivera, 2010)
7	Income from Auditorium Rents	\$	(Hodges et al., 2021)
8	Stated Preference on Degree Values	\$	(O'Halloran et al., 2022)
9	Qualifications Value	\$	(O'Halloran et al., 2022)
10	Value of Created Knowledge	\$	(Durazzi et al., 2013), (Garrido & Gallo-rivera, 2010)
11	Prestige Value of the Building	\$	(Bae & Kim, 2008)
12	Increased Price of Green Area Inside the Campus	\$	(Durazzi et al., 2013), (Siegfried et al., 2007),
13	Increases in Price of Surrounding Municipal Lands Outside	\$	(Watson, 2016)
14	Total Benefits	\$	(Watson, 2016)
15	Annual Budget (Operating Cost)	\$	(Grzeschik, 2010), (Pastor et al., 2013)
16	Maintenance & Repair Expenditures	\$	(Zuluaga et al., 2021)
17	Other Costs	\$	(Watson, 2016)
18	Annual Depreciation of the Building	\$	(Zuluaga et al., 2021)
19	Total Costs	\$	(NEF, 2008)
20	Attribution Factor 2	Dmnl	(NEF, 2008)
21	Deadweight Factor 2	Dmnl	(NEF, 2008)
23	Displacement Factor 2	Dmnl	(NEF, 2008)
24	Drop Off Factor 2	Dmnl	(NEF, 2008)
25	Common Outcomes of the Program	\$	(NEF, 2008)
26	Impact (Net Outcomes)	\$	(NEF, 2008)
27	SROI of the Program	Dmnl	(Watson, 2016)

Figure 7 conceptualizes the formation of outcomes in public sector university operations. The outcome stage follows the input, process, and output stages, acting as a precursor to the impact stage. The input stage includes funding, students, and human and physical resources, such as academic buildings. The process stage encompasses depreciation of these buildings and related maintenance costs, while the outputs consist of the graduates themselves, along with associated financial and non-financial benefits. Common outcomes include the value of qualifications and other externalities. While this may include the private returns on investment, defined as the net benefits to individual students after graduation, this item was not considered in this study (Patrinos and Psacharopoulos, 2020).

The counterfactuals considered include deadweight, attribution, displacement, and drop-off. However, specific conditions in this study mitigate their impact. These conditions include: the absence of perfect alternatives for higher education services; the performance of all activities by the institution itself; the absence of qualification-based displacement; the ability to manage technological changes through high acceptance rates of pre-qualified human resources; and the compensation of government and student opportunity costs via life-cycle benefits and lifetime earnings. Consequently, the counterfactuals are used exclusively to assess the building's net impact based on the proportions of costs associated with each production factor.

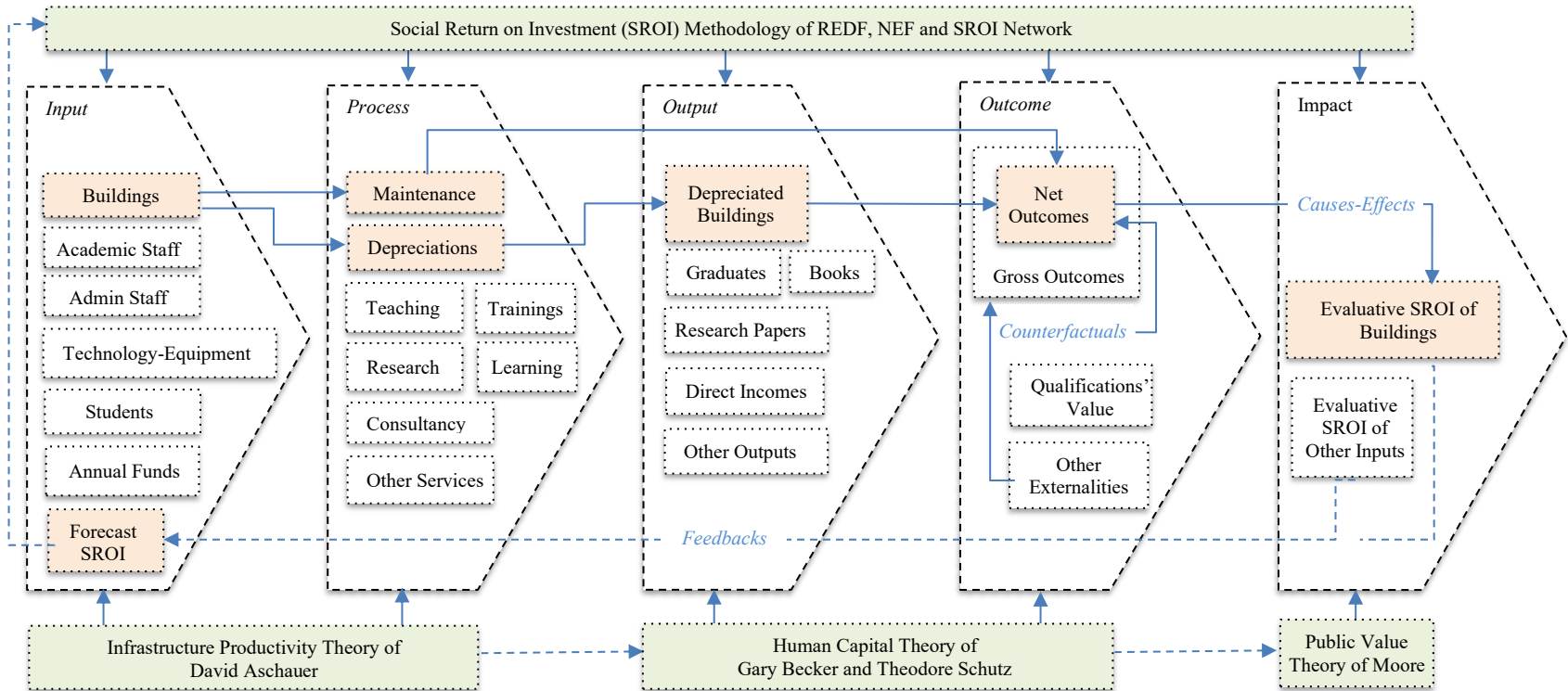


Figure 7. The theoretical framework and outcome map of SROI of public sector university buildings

2.6 Data Analysis

The data were analysed according to the stages 3,4 and 5 of the SROI method as the following sub-sections.

2.6.1 Valuing the Outcomes

Outcomes were assigned financial values directly, through financial proxies, or via a stated preference approach. Summaries of the monetization of outcome elements, based on primary data collected through the questionnaire in Table A-2, are presented in Table A.3. Table A.3 provides the valuation summary of the SROI elements, demonstrating 27 elements, units of measurement, formulas, and the monetary values for each case over a five-year period. Values for quantitative elements are sourced from the relevant questionnaires. Similarly, values for qualitative elements were derived from these questionnaires using the 'conservative first' principle to avoid over-claiming.

The outcomes with tangible contributors were monetized directly as the following:

- i. Income from tuition fees = # of night students * tuition rate
- ii. Income from auditorium rents = # of events taken place * received money

The outcomes with intangible contributors were monetized by financial proxies as the followings:

- i. Value of savings from rent of the faculties = financial proxy 1
- ii. Value added by the associated green areas = financial proxy 2
- iii. Value added to the surrounding municipal lands = # of land lots * financial proxy 3
- iv. Value of created knowledge = # of published research papers and books * financial proxy 4 + # of academic promotions * financial proxy 5

Descriptions of financial proxies (FP) are as the followings:

- i. FP1 = an equivalent cost in case of a rented building for the faculty
- ii. FP2 = (2.8 - 3.1) % * Book value of the building
- iii. FP3 = (current price of a land lot – previous price of the land lot)
- iv. FP4 = the allowance paid for each published paper, or for each published book
- v. FP5 = difference of the salaries for each different academic grade

The outcomes with challenging elements were monetized by the stated preference approach as the followings:

- i. Value of potential benefits from prestige value = the average of stated preferences
- ii. Value of the qualifications or degree value = the average of stated preferences * (# of graduates 1 + # of graduates 2)

The above outcome valuations are valid because the applied financial proxies are reliable as they were developed from the organization's sources (Zappalà & Lyons, 2009), and they are credible as they were used previously and the values are agreed upon (Wilkinson & Kirkup, 2009).

2.6.2 Establishing Impact

According to NEF (2008) and Watson (2016) the impact of an investment is:

$$[\text{Impact}] = [\text{outcomes}] - [\text{deadweight, attribution, displacement, drop-off}] \quad (2)$$

- i. Attribution factor = other costs/funding, other costs = funding – maintenance cost,
- ii. Deadweight = $\text{NPV}_1/\text{NPV}_2 = (\text{Total Benefits}-\text{Total Costs})/ (\text{Total Benefits}-\text{Total Costs}- \text{Savings in Rent}-\text{Rental Costs} + \text{Depreciation})$,
- iii. NPV_1 - Net present value during operation of the building
- iv. NPV_2 – Net present value before operation of the building
- v. Displacement = Drop off = 0.1 (**Table A.3**)

3 Results

3.1 Findings

The SROI of a public-sector university building is defined as its contribution to the production of higher education services, calculated using an attribution factor proportional to building-related costs. As the analysis relies on empirical quantities from the past five years, a discount rate was not applied to the calculations. The findings present the actual social return on investment ratios for three public-sector academic buildings in a low-income country from 2018 to 2022. As shown in Table A.3 (row 27) and Figure 8, the SROI of Case Building II was 1.81 and 1.95 in 2018 and 2019, dropped to -0.08 in 2020, rose to 0.63 in 2021, and reached 1.98 in 2022. Similarly, the SROI of Case Building III was 0.78 and 0.74 in 2018–19, dropped to -0.17 in 2020, rose to 0.23 in 2021, and reached 1.16 in 2022. Conversely, the SROI of Case Building I declined from 0.23 in 2018 to -0.44, -0.17, -0.08, and -0.28, respectively, from 2019 to 2022.

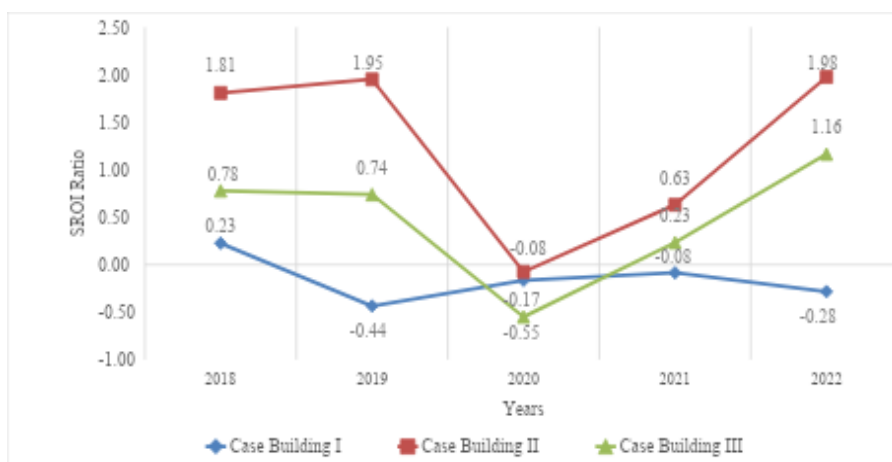


Figure 8. SROI ratios of three case buildings in 2018 to 2022

3.2 Sensitivity Analysis

Conducting a sensitivity analysis for Social Return on Investment (SROI) involves testing how changes in key assumptions (like outcome value or costs) affect the final ratio. Since the findings show significant volatility particularly a sharp decline in 2020 a sensitivity analysis may help to determine if the project's value is robust or highly fragile. The table below demonstrates a 10% decrease in outcome valuation, a standard test to see if the SROI remains positive under less optimistic conditions. This analysis compares the Actual SROI (Baseline) against a Sensitivity Scenario where total social benefits are reduced by 10%.

Table 3. Results of analysis of the SROI sensitivity to a -10% change in total benefits

Years	Values of the SROI ratio					
	Building I		Building II		Building III	
	(Base)	(-10%)	(Base)	(-10%)	(Base)	(-10%)
2018	0.23	0.21	1.81	1.63	0.78	0.70
2019	-0.44	-0.40	1.95	1.76	0.74	0.67
2020	-0.17	-0.15	-0.08	-0.07	-0.17	-0.15
2021	-0.08	-0.07	0.63	0.57	0.23	0.21
2022	-0.28	-0.25	1.98	1.78	1.16	1.04
Average	-0.15	-0.13	1.26	1.13	0.55	0.49

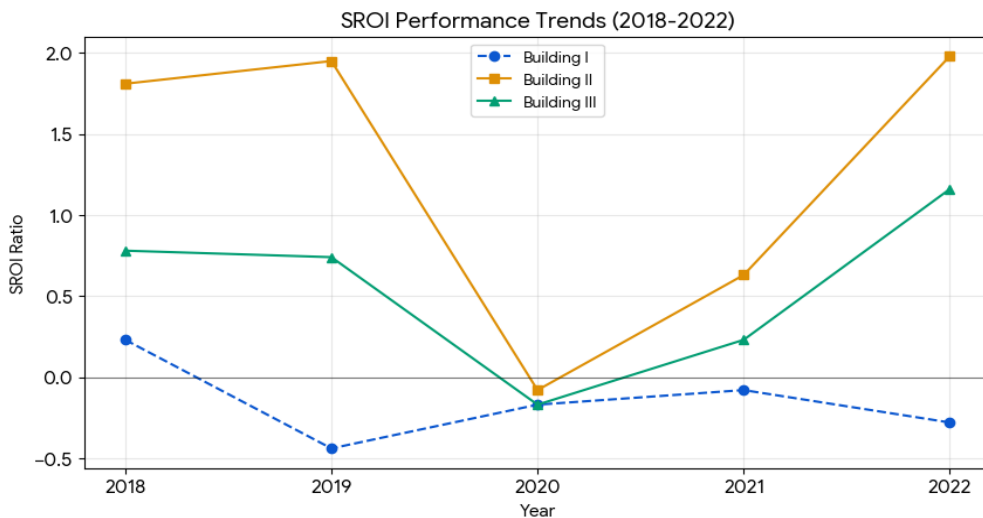


Figure 9. SROI performance trends of three case buildings in 2018 to 2022 for the reduced total benefits

The following analysis may be consistent with the given results of calculations on Table 3 and Figure 9:

- i. *Identify the Break-Even Point:* For Building II, even with a 10% drop in benefits, the average SROI (1.13) stays above 1.0, suggesting it is a robust investment.
- ii. *Evaluate Volatility:* The year 2020 shows a "black swan" event where all buildings had negative SROI. Sensitivity analysis here suggests that the model is extremely sensitive to external shocks (likely COVID-19 related), as even a 10% change in assumptions does not fix the negative return.
- iii. *Assess Risk:* Building I is consistently negative after 2018. Sensitivity analysis confirms that even with slight adjustments to outcome values, the building fails to generate a positive social return, indicating a fundamental issue with its operational model.

- iv. *Determine "Critical Assumptions"*: For Building III, the 2022 SROI of 1.16 is close to the margin. A 10% decrease brings it down to 1.04. This tells stakeholders that the project is "sensitive"; if outcomes are slightly lower than predicted, the project might not break even socially.

Sensitivity analysis reveals that Building II is the most resilient, maintaining an average SROI above 1.0 even with a 10% reduction in outcome value, while Building I remains non-viable across all tested scenarios.

4 Discussion

The paradox of negative SROI over four years suggests that Case Building I operates at a loss, failing to generate social or economic value exceeding its investment, as the building-related costs outweigh the generated value. This scenario highlights "under-utilisation," where massive, expensive, or high-maintenance structures used by a limited number of students function as a cost centre rather than a service-oriented hub, demonstrating that infrastructure alone is insufficient for creating social value. In contrast, the cases of Buildings II and III demonstrate contextual sensitivity in resilience and service differentiation, resulting from negative SROIs in 2020, followed by positive SROIs exceeding the 13.2% average in the other four years. This serves as a striking example of external shocks overriding intrinsic value, confirming the extreme vulnerability of higher education institutions in low-income countries to security issues and pandemics, which act as a multiplier of depreciation and maintenance costs while causing drops in access to education, direct income, and employment opportunities. The positive SROI in Buildings II and III contrasts sharply with Case I, emphasising the importance of asset intensification and service maximisation through time-sharing or the night-college model. This model enables academic buildings to be utilised during "off-hours" for double shifts (day and night), doubling the output (graduates) and enhancing outcomes (value of degrees) without doubling the fixed cost of construction, thus providing relatively immediate economic benefits.

The sensitivity analysis clarifies that Building II is the most resilient investment, with a robust SROI of 1.13 under stress, whereas Building I is fundamentally non-viable and Building III remains highly sensitive to minor outcome fluctuations. This highlights that not all public infrastructure investment delivers value, suggesting that building-related costs in a declining or unstable context can act as a sink rather than a source of value. Furthermore, Cases II and III prove that SROI in volatile environments is not a linear function of time, but is highly dependent on operational continuity. This approach addresses the demand for flexible, accessible, and high-quality practical higher education that can maximise the economic and social value of degrees while producing high value-to-cost ratios for universities in low-income countries, compared to those that only offer traditional, rigid daytime programmes.

This study adopts the recommendations of previous scholars regarding the consideration of indirect benefits, net impacts, social returns, and the normalisation of investment levels in public-sector higher education infrastructure, as well as the assessment of investment impacts in non-profit organisations and public infrastructure (Siegfried et al., 2007; Acharya, 2010; Bromilow & Pawsey, 2013; Shirazai, 2018; Casalini, 2018; Muravska et al., 2020; Alghamdi et al., 2022). It further incorporates the empirical analysis of social dimensions recommended by Kordi et al. (2021). The study extends the work of Watson et al. (2016), Patrinos and Psacharopoulos (2020), and Kordi et al. (2021, 2022) by investigating the influence of social values on physical design, practically examining social returns to higher education in low-income countries, and analysing social attributes such as satisfaction, impact, employment, procurement, and training and end-user stakeholders using primary interview data. Additionally, it applies the SROI method as a sustainability assessment tool for building construction projects.

The study contributes in several dimensions. Theoretically, it establishes a value-for-money paradigm where physical investments are justified through an SROI framework that bridges intangible educational outputs with tangible financial metrics, providing a theoretical justification for continued funding. Methodologically, it shifts the evaluation from purely financial cost-accounting to a blended value approach, necessitating the adaptation of SROI to translate qualitative improvements into monetary proxies by capturing intangible social outcomes, rather than relying solely on traditional depreciation-based asset valuation. Practically, it assists researchers in

translating qualitative benefits into monetary terms while analysing building stakeholders; helps investors achieve positive returns by moving beyond merely providing space to focus on offering relevant and accessible services; and enables policymakers to prioritise more sustainable investments through the design of high-density and multi-temporal, public-sector university infrastructure. Finally, it contributes to the literature on social innovation projects and public policies on university infrastructure development.

This study offers several novel contributions, such as bridging the gap between theory and the practical application of the SROI method in public academic buildings, considering these buildings as change facilitators and essential components of the faculty's broader resource outcomes. Furthermore, it translates hidden qualitative social values into monetary terms, provides a comparative analysis of distinct academic buildings and stakeholders, and applies the SROI method within a low-income country characterised by distinct dynamics and limited data. These aspects provide a fresh perspective and a practical, pioneering application of the methodology in such an environment.

The study may be constrained in terms of robustness checks. However, this limitation is justified by the sensitivity analysis for a key scenario, the use of a "conservative first" approach with lower-bound estimates, the application of a high attribution factor (81%–91%), and stakeholder verification of the outcomes' longevity. Other limitations to be addressed by future research include the absence of "health and safety" and "human rights" attributes, the exclusion of earlier-stage stakeholders (Kordi et al., 2021), limited consideration of wider benefits, and a focus on a single geography and organisation type.

Future studies should focus on conducting comprehensive sensitivity analyses and assumption tests, expanding the scope of social sustainability attributes and stakeholders, and applying the model across a wider range of low-income countries and public sector universities to improve generalisability.

5 Conclusion

An analysis of three public university buildings in a low-income country from 2018 to 2022 shows volatile SROI ratios proportional to building costs, calculated without discount rates. Case Buildings II and III demonstrated a "V-shaped" recovery, with SROI falling to negative values in 2020 (-0.08 and -0.17, respectively) before rebounding to 1.98 and 1.16 by 2022. Conversely, case Building I consistently underperformed, with SROI declining from 0.23 in 2018 to -0.28 in 2022.

The findings suggest that the value of academic buildings in low-income countries depends heavily on management. Flexible, demand-driven usage can create higher social returns than underutilised physical assets; however, consistent value generation requires operational stability and the ability to maintain services during varying conditions. Consequently, relevant authorities are recommended to:

- i. Focus capital and resources on the most resilient investments (e.g., Building II);
- ii. Halt further investment in non-viable buildings (e.g., Building I);
- iii. Implement strict monitoring for SROIs that are highly sensitive to minor fluctuations (e.g., Building III);
- iv. Maintain consistent operations and perform context analysis prior to infrastructure design;
- v. Implement flexible and accessible models that align with market demands in low-income contexts.

Despite some limitations, this study reframes higher education physical infrastructure as a value-generating asset a capital-for-change perspective rather than a sunk cost or a cost-centre mentality, by providing a holistic, evidence-based impact evaluation metric integrated into a Social Return on Investment (SROI) methodology.

It moves evaluation paradigms from cost-minimisation towards maximising social value, justifying continued investment despite budgetary constraints. It proves that investing in physical spaces in resource-constrained environments can provide measurable social and academic value. These values provide a standardised language that justifies funding to international donors and sceptical governments who usually only look at graduation rates or GDP.

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Declaration of Conflicting Interests

All authors declare that they have no conflicts of interest.

Author Contribution

Conceptualisation, Mohammad Sharif Sharif; Methodology, Mohammad Sharif Sharif; Validation, Grit Ngowtanasuwan; Analysis, Mohammad Sharif Sharif and Grit Ngowtanasuwan; Investigation, Mohammad Sharif Sharif; Resources, Mohammad Sharif Sharif; Data Curation, Mohammad Sharif Sharif and Grit Ngowtanasuwan; Writing-Draft Preparation, Mohammad Sharif Sharif; Writing-Review & Editing, Grit Ngowtanasuwan, Shoeb Ahmed Momen and Mazlina Zaira Mohammad; Visualisation, Mohammad Sharif Sharif and Grit Ngowtanasuwan; Supervision, Grit Ngowtanasuwan, Shoeb Ahmed Momen and Mazlina Zaira Mohammad; Project Administration, Mazlina Zaira Mohammad; Funding Acquisition, Mohammad Sharif Sharif.

All authors have reviewed and approved the final version of the manuscript for publication.

Declaration of Generative Ai in The Writing Process

During the preparation of this work, the authors used **OpenAI ChatGPT** solely to **improve the readability, grammar, clarity, and overall language quality of the manuscript**. The tool was not used to generate original research findings, data, analyses, interpretations, or conclusions. After using this tool, the authors carefully reviewed, verified, and edited the content as necessary and take full responsibility for the accuracy, originality, integrity, and final content of the publication.

Data Availability/Supplementary Materials

Available upon request:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics Statement

This study was reviewed and approved by the Institutional Ethics Committee of Universiti Teknologi MARA (UiTM) (Approval No: REC/02/2022 (PG/MR/17)). All procedures involving human participants subjects were in fulfilment of the ethical standards of the 1964 Helsinki Declaration. Informed consent was obtained from all participants, and data anonymity was strictly maintained throughout the study.

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Appendixes

Table A.1. The stakeholders

No.	Stakeholder Category	Case Building I	Case Building II	Case Building III	University	Total
1	Dean of Faculty	6	2	2	0	10
2	Head of Department	3	1	1	0	5
3	Directorate of Students Affairs	6	2	2	0	10
4	Directorate of Scientific Journals	0	0	0	2	2
5	Directorate of Professors Affairs	0	0	0	1	1
6	Directorate of Finance	0	0	0	1	1
7	Graduate 2018	1	0	1	0	2
8	Graduate 2019	1	0	0	0	1
9	Graduate 2020	5	1	0	0	6

10	Graduate 2021	2	4	2	0	8
11	Graduate 2022	1	0	1	0	2
12	Municipality Engineer	0	0	0	1	1
Total		25	10	9	5	49

Table A.2. Data collection form for values of public university buildings' SROI elements
فورم جمع آوری معلومات برای قیمت های عناصر سیستم SROI پروژه های تعمیرات تدریسی دولتی *

No شماره	Element Name (نام عنصر (شاخص ها	Unit واحد اندازه	Indicators	Years سال ها				
				2018	2019	2020	2021	2022
1	"# of Sets" تعداد سیت ها	person	ظرفیت تعمیر					
2	Tuition Fee Rate	\$(Year*person)	فیس سالانه					
3	udget per Student محصل فی	\$(Year*person)	بودجه سالانه پوهنتون تقسیم محصلان فاکولته					
4	Students محصلان روزانه	person	محصلان مجموعی موجود در فاکولته					
5	Initial Demand for Infrastructure	dollars	ارزش تخمینی زیربنا های مورد ضرورت					
6	Increased Price of Lands	dollars	افزایش قیمت اراضی ماحول					
7	Night Students محصلان شبانه	person/Year	محصلان شبانه					
8	Initial Value of Building	dollars	ارزش اولیه تعمیر مورد نظر					
9	Maintenance & Repairs	dollars/Year	مصارف حفظ و مراقبت و ترمیم					
10	Admission of New Students	#	The number of annual new students					
11	Graduates فارغان بخش روزانه	#	بر اساس نتایج کانکو دیپارتمنت های مربوطه					
			بر اساس جداول فارغان دیپارتمنت های مربوطه					
			1. Very Low (0%) بسیار پائین					
			2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					
12	Stated Preference about Degree Value		1. < 1000 \$					
	نظریات در مورد ارزش مادی درجه		2. (1000-2000) \$					
	تحصیل یا سند تحصیلی	مادی	3. (2000-3000) \$					
		\$	4. (3000-4000) \$					
			5. > 4000\$					
			6. Exact amount? مبلغ مشخص					
			1. Very Low (0%) بسیار پائین					
			2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					
13	Quality Assurance Score	%	1. Very Low (0%) بسیار پائین					
	سهم تعمیر تدریسی در کیفیت فاکولته		2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					
14	Building Users' Satisfaction (Indicators: Availability of main academic functions & basic facilities)	%	1. Very Low (0%) بسیار پائین					
	رضایت از قابلیت خدمت رسانی		2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					
15	Prestige Value of the Building	\$	(Bestowing naming rights to the academic building in recognition of the financial support) (تعمیر به سایر نهاد ها در مقابل حمایت مالی)					
	ارزش اعتباری تعمیر		Values of published articles + academic promotions					
16	Value of Created Knowledge	dollars/Year	ارزش مقالات علمی + ترفیعات علمی					
	ارزش دانش تولید شده		Total Value of Incomes (\$) ارزش مجموعی درآمد ها					
17	Rents	\$	کرایه سالانه تخمینی معادل یک فاکولته					
	کرایه تسهیلات تعمیر تدریسی		مجموعه ارزش معادل کرایه فاکولته ها به (\$) (تعمیر به سایر نهاد ها در مقابل حمایت مالی)					
18	Potential Rents	\$	مجموعه ارزش معادل کرایه فاکولته ها به (\$) (تعمیر به سایر نهاد ها در مقابل حمایت مالی)					
	امکانات کرایه بطور بالقوه	#	تعداد اداراتی که در تعمیر فعالیت دارند					
		\$	کرایه سالانه معادل برای یک واحد اداری					

No شماره	Element Name (نام عنصر (شاخص ها	Unit واحد اندازه	Indicators	Years سال ها				
				2018	2019	2020	2021	2022
		\$	مجموعه ارزش معادل سالانه کرایه ادارات (\$)					
		\$	مجموعه ارزش معادل سالانه کرایه ها (\$)					
19	Effectiveness of Economic Policies موثریت پالیسی های اقتصادی (Indicators: SROI, Obligation, Application)	%	1. Not at all influential بکلی غیر موثر					
			2. Slightly influential غیر موثر					
			3. Somewhat influential کمی موثر					
			4. Very influential بسیار موثر					
			5. Extremely influential نهایت موثر					
20	Value of Surrounding Green Area ارزش ساحه سبز تعمیر	\$	-					
21	Level of partnership with service sectors in the community سطح مشارکت با سکتور های خدماتی در جامعه	%	1. Never هرگز					
			2. Seldom ندرتا					
			3. Sometimes گاهی					
			4. Often اکثرا					
			5. Almost always تقریبا همیشه					
22	Level of (curriculum) focus to social and economic progress of community سطح تمرکز (نصاب تحصیلی) به پیشرفت اجتماعی-اقتصادی جامعه	%	1. Not a priority در اولویت قرار ندارد					
			2. Low priority در اولویت ضعیف					
			3. Medium priority متوسط					
			4. High priority در اولویت بلند					
			5. Essential ضروری					
23	Level of consciousness about social values درجه آگاهی درباره ارزش های اجتماعی	%	1. Not at all aware قطعاً آگاهی ندارند					
			2. Slightly aware کمی آگاه					
			3. Somewhat aware تا حدی آگاه					
			4. Moderately aware با آگاهی متوسط					
			5. Extremely aware بکلی آگاه					
24	flexibility to target the socioeconomic needs انعطاف نصاب تحصیلی در نیاز های اجتماعی-اقتصادی جامعه	%	1. Very Low (0%) بسیار پائین					
			2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					
25	Gender equity (Level of convenience of female students) تساوی جنسیتی (سطح تسهیلات لازم برای محصلان اناث)	%	1. Very Low (0%) بسیار پائین					
			2. Below Average (25%) پائین					
			3. Average (50%) متوسط					
			4. Above Average (75%) بلند					
			5. Very High (100%) بسیار بلند					

Comments:

Academic Building Information:

Building Title	Base Area (m ²)	Number of floors	Capacity for students	Donor agency	Handover year	Total Cost (\$)	# of Faculties
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* The Persian language is used for ease of communication during Interviews

Table A.3. Valuation of outcome elements

No	Element Name	Unit	Sources/Formulas	Case Building I					Case Building II					Case Building III				
				2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
1	Students in Day-Shift	Person	# of Students at the End of Each Year in the Case Buildings	3858	3615	3795	4041	3671	2088	2180	2673	2835	2393	1618	1533	1440	1414	1184
2	Students in Night Faculty (Bachelor)	Person	At the end of each year in the Case Buildings	0	0	0	0	0	432	394	403	282	189	76	60	40	36	20
3	Graduation from Day Shift	Person	From the Faculties Operating in the Case Buildings	669	799	767	685	836	327	327	466	28	367	327	374	0	246	478
4	Graduates from Night Faculty	#	From the Faculties Operating in the Case Buildings	0	0	0	0	0	252	305	28	282	266	49	0	49	0	0
5	Tuition Fees	\$	(Students in Night Faculty * Rate) Rate = 200\$/person	0	0	0	0	0	86400	78800	80600	56400	37800	15200	12000	8000	7200	4000
6	Savings in Building Rents	\$	Based on the Equivalent Rent Costs(# of Faculties * Equivalent Rent)	106551	109466	85917.6	94107.2	120610	34335.9	35925	34612.8	27881.6	29034.6	8135.64	8135.64	8135.64	8135.64	8135.64
7	Auditorium Rents	\$	Based on the Equivalent Rent Costs(# of Events * Equivalent Rent)	6845	2673	756	3443	8606	0	0	0	0	2025	0	0	2880	1080	1575
8	Stated Preference on Degree Values	\$	-	3000	650	2000	2000	1000	3000	3000	1000	3000	3000	3000	3000	3000	3000	3000
9	Qualifications Value	\$	Based on Stated Preference Valuing (# of Graduates * Degree Value)	2007000	519350	1534000	1370000	836000	1737000	1896000	494000	930000	1899000	1128000	1122000	147000	738000	1434000
10	Value of Created Knowledge	\$	(# of Published Journals * Publishing Allowance + # of Academic Promotions * Increased Salary)	2836	6294	7756	1531	2040	4380	3799	2512	1139	60	1712	4796	6411	562	28

No	Element Name	Unit	Sources/Formulas	Case Building I					Case Building II					Case Building III				
				2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
11	Prestige Value	\$	Based on the Stated Preference by the Heads of Faculties	28000	31000	29000	28000	29000	26000	24000	23000	26000	35000	1000	2000	2500	1000	1000
12	Value added by Surrounding Green Area	\$	(2% of the Building Initial Value * Area of Green Surroundings)	102911	101039	99168.3	97297.2	95426.1	30584	30056.7	29529.4	29002.1	28474.7	43630.7	42865.2	42099.8	41334.3	40568.9
13	Increases in Price of Municipal Lands	\$	(Differences of Municipal Land Prices)	8237	4805	3089	2746	2746	3089	2231	514.8	171.6	171.6	3089	2231	514.8	171.6	171.6
14	Total Benefits	\$	Sum of Direct and Indirect Benefits (5+6+7+8+9+10+11+12)	2262378.4	774627.5	1759686.7	1597123.5	1094427.9	1921788.7	2070811.5	664768.96	1070594.3	2031565.9	1200767.1	1194027.6	217541.19	797483.54	1489479.1
15	Annual Budget	\$	(University Budget/16) * # of Faculties	1565887	1601815	2056974	1610583	1552459	521962.5	533938.2	685657.8	536860.9	517486.4	521962.5	533938.2	685657.8	536860.9	517486.4
16	Maintenance & Repair Expenditures	\$	Fixed Amounts of Annual Budget	3699.6	4032.22	9072.58	7736.69	40322.6	1233.2	1344.07	3024.19	2578.9	13440.9	1233.2	1344.07	3024.19	2578.9	13440.9
17	Other Costs	\$	(Annual Budget – Maintenance Cost)	1562187.8	1597782.3	2047901	1602845.9	1512136.6	520729.28	532594.09	682633.65	534281.97	504045.55	520729.28	532594.09	682633.65	534281.97	504045.55
18	Depreciation	\$	Based on the Straight Line Method (Initial Value/Useful Life) Useful Life = 60 years Salvage Value = 0	183333	183333	183333	183333	183333	51666.7	51666.7	51666.7	51666.7	51666.7	75000	75000	75000	75000	75000

No	Element Name	Unit	Sources/Formulas	Case Building I					Case Building II					Case Building III				
				2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
19	Total Costs	\$	Annual Budget + Depreciation	1749220.74	1785147.78	2240306.84	1793915.91	1735792.52	573629.18	585604.86	737324.54	588527.57	569153.11	596962.48	608938.16	760657.84	611860.87	592486.41
20	Attribution Factor 2	Dmnl	Other Costs/Total Costs	0.89	0.90	0.91	0.89	0.87	0.91	0.91	0.93	0.91	0.89	0.87	0.87	0.90	0.87	0.85
21	Deadweight Factor 2	Dmnl	(Total Benefits-Total Costs)/(Total Benefits-Total Costs-Savings in Rent- Rental Costs + Depreciation)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22	Displacement Factor 2	Dmnl	A lossed 10% return on investment in other options	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23	Drop Off Factor 2	Dmnl	Loss of the Building's outcome may be by E-learning or other factors	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
24	Common Outcomes of the Program	\$	Net Present Value * (1- Attribution) *(1-Deadwight) *(1-Displacement) *(1-Drop Off) (Discount Rate = 0)	513157.66	-1010520.28	-480620.14	-196792.41	-641364.62	1348159.5	1485206.61	-72555.58	482066.68	1462412.83	603804.61	585089.48	-543116.65	185622.67	896992.68
25	Impact (Net Outcomes)	\$	Common Outcome * (1- Attribution)*(1-Deadwight)*(1-Displacement)*(1-Drop Off)	42221.42	-81614.84	-31762.99	-16129.00	-63591.07	95669.50	103455.82	-4141.29	34191.13	128730.34	59333.80	56445.98	-42868.83	18110.51	103031.99
26	SROI of the Program	Dmnl	Common Outcomes / (Depreciation + Annual Budget)	0.29	-0.57	-0.21	-0.11	-0.37	2.35	2.54	-0.10	0.82	2.57	1.01	0.96	-0.71	0.30	1.51
27	SROI of the Building	Dmnl	Net Outcomes / (Depreciation + Maintenance)	0.23	-0.44	-0.17	-0.08	-0.28	1.81	1.95	-0.08	0.63	1.98	0.78	0.74	-0.55	0.23	1.16