



Sustainable working capital management in education: Concept, policy, efficiency, and measurement from an Islamic perspective

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ABSTRACT

Background: Sustainable working capital management is crucial for ensuring the operational sustainability, financial stability, and long-term resource resilience of educational institutions, which in turn underpins their contribution to inclusive and sustainable human capital development. In Islamic education, management must also reflect principles of accountability, justice, and *maqāṣid al-sharī'ah*, reinforcing responsible, sustainable resource stewardship at the institutional level. **Methods:** This study used a qualitative approach based on library research. Data were drawn from relevant scientific literature, government regulations, and previous studies concerning educational working capital management, institutional financial sustainability, and Islamic financial principles. **Findings:** The findings indicate that educational working capital consists primarily of short-term operational funds that must be managed effectively, efficiently, transparently, and accountably to sustain institutional operations over time. Effective and sustainable management contributes to institutional financial stability, improved learning quality, and greater institutional independence, supporting the long-term viability of educational service delivery. From an Islamic perspective, working capital is an *amanah* that should be managed in accordance with *maqāṣid al-sharī'ah* while avoiding *riba*, waste, and injustice — principles that align closely with sustainable and responsible resource management. Its efficiency can be assessed through quantitative and qualitative indicators, including working capital ratios, cost per learner, financial reporting transparency, and its contribution to sustainable educational service quality. **Conclusion:** Professional and Islamic-oriented working capital management provides a strong foundation for educational institutions' financial sustainability, resource efficiency, and long-term competitiveness. **Novelty/Originality of this article:** This article integrates conventional working capital management principles with Islamic education and *maqāṣid al-sharī'ah* and proposes a multidimensional framework to assess sustainable working capital efficiency in educational institutions.

KEYWORDS: efficiency finance; financing education; management Islamic education; working capital costs.

1. Introduction

Funding is a fundamental component of the education system and plays a major role in achieving educational goals. According to Siddik, as cited in Munir et al. (2023), educational funding is the financial support provided by a party to support planned educational

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investments, both at the individual and institutional levels. Although funding is not the sole determinant of educational quality, the availability of adequate funding is a key prerequisite for ensuring that the educational process can proceed effectively, sustainably, and with high quality.

One form of funding that requires careful management is educational working capital. Educational working capital refers to funds used to finance the routine operational needs of educational institutions, such as paying the salaries of educators and educational staff, procuring teaching materials, maintaining facilities and infrastructure, and funding other academic and non-academic services—all of which must be continuously available to ensure that educational activities run smoothly (Alhamda & Karim, 2025). Therefore, the management of working capital requires an effective, efficient, transparent, and accountable financial management system, given that educational funds are not merely administrative in nature but also entail moral and social responsibilities (Zahirah & Suhaedi, 2025; Rizka et al., 2025).

In practice, the management of working capital for education encompasses not only financial recording and reporting but also involves strategic planning, budgetary decision-making, the allocation of funds based on priorities, as well as monitoring and evaluation of budget implementation (Siska et al., 2026; Sa'diyah et al., 2026; Presiden et al., 2026). Educational institutions are required to develop budgets based on actual needs (needs-based budgeting), optimize the use of available resources, and conduct periodic evaluations to ensure the efficient and effective use of education funds.

As global attention to sustainable development issues grows, the management of education financing also faces demands to integrate principles of environmental sustainability (Sugartini & Jannah, 2025; Babaola & Olawuyi, 2021; Lyu et al., 2025). The green budgeting approach has emerged as a budgeting model that incorporates considerations of environmental impact and sustainable development goals into every stage of budget planning and management. In the context of education, the implementation of green budgeting has the potential to promote efficient resource use, reduce energy waste and operational costs, and strengthen the role of educational institutions in supporting Education for Sustainable Development (ESD) and green economic development.

From an Islamic educational perspective, the management of educational working capital has strong normative and spiritual dimensions. Educational funds are viewed as a trust that must be managed in accordance with Sharia principles, such as justice (*'adl*), public interest (*maslahah*), efficiency, transparency, and the prohibition against usury (*riba*) and wastefulness (*israf*) (Samsuri, 2022). These principles are substantially aligned with the values of sustainability and social responsibility that underpin green budgeting and sustainable development. However, academic studies that comprehensively integrate the concepts of educational working capital costs, environmentally friendly financing policies, efficient budget management, and the Islamic educational perspective remain relatively limited.

Based on the above discussion, this study aims to analyze the concepts, management, policies, efficiency, and measurement of working capital costs in education from the perspective of Islamic education, as well as to examine their relevance to the principles of green budgeting, Education for Sustainable Development (ESD), and the contribution of educational institutions to green economic development. Thus, this study is expected to provide a theoretical contribution to the development of research on Islamic education financing, as well as practical insights for educational institution administrators in designing financing systems that are efficient, sustainable, and grounded in Islamic values.

Beyond the institutional level, the topic carries a development economics dimension. Working capital is the recurrent part of an education budget, and recurrent spending decisions—on energy, water, materials, and maintenance—shape both the efficiency with which public and community resources are used and the human capital that education produces. This study therefore makes three contributions: (i) a conceptual framework that links educational working capital, green budgeting, and green economic development through Islamic ethical principles; (ii) a set of measurable indicators that extends

conventional working capital indicators to financial, environmental, social, and governance dimensions; and (iii) a mapping of policy mechanisms and their implications for sustainable and equitable education financing.

1.1 Education working capital cost (education working capital cost)

Educational working capital refers to all short-term financial resources owned and utilized by educational institutions to support daily operational activities. These resources include funds allocated for the payment of salaries to educators and educational staff, the procurement of teaching materials, the provision of services to students, the maintenance of facilities and infrastructure, as well as various other operational needs. The availability of adequate working capital is a determining factor in an educational institution's liquidity, as it directly affects the institution's ability to meet short-term financial obligations and maintain the continuity of academic activities. Therefore, working capital serves not only as a tool to support financial administration but also as the primary foundation for the sustainability and stability of educational operations (Yolanda & Karim, 2025).

In the context of education, working capital management emphasizes the systematic planning and control of cash flow. This includes scheduling and recording the receipt of funds—such as tuition fees, government subsidies, and public donations—as well as managing expenditures directly related to the learning process and educational services. Effective working capital management enables educational institutions to anticipate imbalances between revenue and expenditures, minimize the risk of operational funding shortfalls, and ensure that all academic activities proceed as planned. The conceptual literature indicates that sound working capital management contributes to strengthening the financial position of educational institutions and enhances their capacity to sustainably meet the needs of academic activities (Singh & Kumar, 2014; Nsiah et al., 2025; Arbo & Benneworth, 2007).

Furthermore, the measurement of working capital in education is conducted through several key components, including the cash conversion cycle, management of educational receivables, inventory of teaching materials, and short-term liabilities. The efficiency of working capital management can be analyzed using financial indicators such as liquidity ratios, accounts receivable turnover ratios, and the effectiveness of budget preparation and implementation (Abuzayed, 2012). These indicators provide insight into an educational institution's ability to manage its financial resources optimally. A high level of working capital efficiency will have a positive impact on the operational sustainability of educational institutions, the improvement of academic service quality, and the sustainable achievement of educational goals (Yolanda & Karim, 2025).

1.2 Education financing policies and management

Various education financing models have been studied and identified in the international education literature as efforts to ensure the operational sustainability of educational institutions while improving the quality of educational services. These funding models include full public funding, pay-for-performance schemes that link budget allocations to educational performance outcomes, and needs-based subsidies aimed at expanding access to education more equitably. The implementation of these funding models is aimed at improving accountability in fund management, ensuring equitable access to education, and enhancing the quality of educational outcomes. In a global context, the diversity of these funding models is crucial for aligning funding policies with the characteristics of each country's education system and its socio-economic challenges, thereby ensuring that the operational funding of education can be managed effectively and sustainably (Rukmana et al., 2025).

In line with these developments, policies aimed at improving the efficiency of education budgets have become a central issue in the management of modern education financing. Budget efficiency is not interpreted merely as a reduction in costs, but rather as an effort to

optimize the use of financial resources without sacrificing the quality of services and educational outcomes. Strategies commonly implemented in budget efficiency policies include performance-based budgeting, increased budget transparency and accountability, and the use of information technology in the education finance system to reduce waste and improve the accuracy of fund allocation. This approach enables educational institutions to manage their budgets in a more rational, measurable, and results-oriented manner (Aulia et al., 2025).

From an Islamic educational perspective, the management of educational funding is not only oriented toward economic efficiency but also toward upholding Sharia principles that emphasize the values of trust, justice, transparency, and sustainability. Specialized literature on Islamic education financing indicates that the management of education costs must be carried out in an accountable and responsible manner, avoiding wasteful practices (*israf*) and ensuring that the use of funds is truly directed toward the welfare of students and the community. These values are conceptually aligned with modern financial objectives and Islamic ethical principles, and they reinforce the orientation toward sustainability in education financing policies (Fauzan et al., 2025).

1.3 Education for sustainable development (ESD) and sustainable education

Education for Sustainable Development (ESD) is an educational approach designed to equip students with the knowledge, skills, values, and attitudes necessary to address the challenges of sustainable development. Through this approach, education focuses not only on academic achievement but also on fostering critical awareness and social responsibility toward environmental, social, and economic issues in an integrated manner. ESD-based education encourages students to understand the interconnections between human activities, the sustainability of natural resources, social justice, and economic growth, enabling them to make responsible decisions in both their personal and professional lives (Arora, 2025).

One concrete way ESD is implemented in educational practice is through the development of green schools. The green schools concept integrates sustainability principles into all aspects of school management, ranging from resource planning and management, efficient use of energy and water, to waste reduction and carbon emissions reduction. In addition, green schools also implement an environment-based curriculum that instills sustainability values in the learning process and encourages the active involvement of the school community and the surrounding community in supporting environmentally friendly educational practices. Through this approach, educational institutions serve not only as centers for knowledge transfer but also as agents of social change that contribute to sustainable economic development and the formation of a green culture within the educational environment (Arora, 2025).

1.4 Green budgeting & environmentally friendly education financing policies

Green budgeting is a budgeting approach that explicitly integrates considerations of environmental impact and sustainable development goals into all stages of the budgeting process, from planning and allocation to budget execution and evaluation. The primary objective of this approach is to ensure that fiscal policies adopted by the government and public institutions consistently support environmental protection, climate change mitigation and adaptation, and the achievement of sustainable development goals. Thus, green budgeting serves not only as a technical instrument for budget management but also as a strategic policy framework for aligning fiscal decisions with the global sustainability agenda (Aktaş, 2023).

Various global studies show that green budgeting has been adopted in a number of countries as a policy tool to achieve fiscal sustainability while meeting the targets of the Sustainable Development Goals (SDGs). The implementation of green budgeting is generally characterized by the development of environment-based budget indicators, increased fiscal

transparency and accountability, and the integration of environmental considerations into public budgets. This approach enables governments and public institutions to assess the extent to which their budgetary policies contribute to environmental goals, while also identifying potential fiscal risks associated with environmental degradation and climate change (D’Orazio, 2025).

Although the implementation of green budgeting is still relatively rarely discussed in specific terms in the literature on education financing, its basic principles are highly relevant for application to education budgets. In the context of education, green budgeting can be directed toward prioritizing environmentally friendly programs and activities, such as investments in green educational infrastructure, reducing campus carbon footprints, improving energy and water efficiency, and strengthening curricula based on Education for Sustainable Development (ESD). In addition to contributing to environmental conservation, the implementation of green budgeting in education budgets also has the potential to improve long-term cost efficiency through energy savings and the optimization of resource use, thereby supporting the financial sustainability of educational institutions.

1.5 The contribution of educational institutions to green economic development

Various studies show that education plays a strategic role in promoting green economic development by increasing public awareness, knowledge, and skills to support sustainable innovation. Education serves as a key instrument in shaping mindsets and behaviors that are environmentally conscious, while also preparing human resources capable of responding to both economic and environmental challenges simultaneously. Through an educational process integrated with sustainability issues, students are encouraged to develop competencies relevant to the transition toward a green economy, such as the use of environmentally friendly technologies, resource efficiency, and sustainability-based innovation (Huda et al., 2024).

At a more specific level, higher education plays a very significant role in accelerating the transition to a low-carbon economy. Universities serve as centers for the development of science and technology, where research and innovation in green technology, renewable energy, and sustainable business practices take place. Furthermore, higher education facilitates strategic collaboration among academia, industry, and government—a key factor in the development and implementation of green economy solutions. This collaboration enables academic research findings to be more widely adopted in the industrial sector and public policy, thereby strengthening education’s contribution to sustainable economic development (Huda et al., 2024).

In line with this, empirical studies in China show that high-quality education not only raises individual awareness of green finance issues—including green digital finance—but also builds the workforce’s capacity and competencies needed to support a sustainable financial sector. Quality education plays a role in creating human resources who possess green financial literacy, analytical skills, and an understanding of sustainability principles, thereby enabling them to actively contribute to the development of green economy initiatives. These findings underscore that investment in education is a key factor in accelerating green economic development by strengthening human capacity and building a sustainability-oriented financial system (Lee et al., 2025).

2. Methods

2.1 Research design and data collection

This study employs a qualitative approach using library research to develop an in-depth understanding of the concepts, policies, and practices related to the management of working capital costs in education. Research data were obtained from relevant sources, including academic books, articles published in reputable national and international journals, laws and regulations, and policy documents concerning education financing and

management. Sources were selected based on their relevance to the research topic, credibility, and publication recency.

2.2 Data analysis and synthesis

Data were analyzed using content analysis. The process began with identifying and classifying key concepts related to educational working capital costs, financial management, budget efficiency, green budgeting, and Islamic education. The findings and conceptual frameworks identified in the literature were then compared and synthesized to develop an integrated understanding of educational working capital cost management.

To make the synthesis explicit, the selected sources were mapped against four analytical dimensions: (1) the concept and operation of educational working capital; (2) education financing policy and budget efficiency; (3) green budgeting and education for sustainable development (ESD); and (4) the contribution of education to green economic development. Islamic ethical principles were incorporated as a cross-cutting normative lens rather than treated as a separate analytical dimension. The proposed indicators and mechanisms are analytical constructs derived from the reviewed literature, not empirical findings. Their validity and practical applicability therefore require further assessment through future empirical research.

3. Results and Discussion

3.1 Basic concepts of educational working capital

Educational working capital refers to all funds required by educational institutions to finance daily operational activities in order to ensure the smooth running of the learning process (Alhamda & Karim, 2025). The availability of working capital serves as a crucial foundation for ensuring that all educational activities can proceed in a sustainable and well-planned manner. These costs include routine expenditures such as salaries for teachers and educational staff, electricity and water bills, the procurement of teaching materials, and the maintenance of educational facilities and infrastructure, all of which directly impact the quality of educational services provided to students. According to Mulyadi in Alhamda & Karim (2025), working capital also includes reserve funds set aside to address financial instability resulting from delays in fund disbursement or a decline in student enrollment, thereby ensuring that educational institutions can continue their operations without significant disruption.

The components of working capital in education include cash and cash equivalents, accounts receivable, inventory, prepaid expenses, short-term liabilities, and operating reserves (Dewi, 2021). Each of these components plays an interrelated role in supporting the financial stability of educational institutions. Based on its nature, working capital is classified into permanent working capital and variable working capital (Dewi, 2021). Permanent working capital is required on an ongoing basis to support the institution's core operations, while variable working capital is flexible and adapts to changing needs, such as an increase in the number of students or specific academic activities. Working capital plays a strategic role in ensuring the continuity of the educational process, improving service quality, and promoting the autonomy of educational institutions (Sasmita & Samsinar, 2024).

From an Islamic perspective, the management of educational funds must be based on the principles of trust (*amanah*), transparency, efficiency, and accountability, while avoiding usury (*riba*), uncertainty (*gharar*), and gambling (*maysir*) (Samsuri, 2022). These principles emphasize that the management of working capital must not only be effective from a managerial standpoint but must also adhere to Islamic ethical and moral values so that educational funds can provide sustainable benefits for all stakeholders. Furthermore, integrating these principles into financial planning and resource allocation can strengthen institutional integrity and ensure that funds are utilized in accordance with educational

priorities. Consequently, Islamic financial ethics can serve as a foundation for promoting the long-term sustainability of educational financing while fostering public trust and equitable access to educational resources.

3.2 Management and objectives of educational working capital

The management of educational working capital is the process of planning, allocating, controlling, and evaluating the use of an educational institution's operational funds (Alhamda & Karim, 2025). This process requires a structured financial management system to ensure that all available funds are utilized optimally and targeted effectively. The main principles of working capital management include thorough budget planning, effective fund allocation, strict oversight, and diversification of funding sources, so that educational institutions have financial resilience in facing the dynamics of operational needs and changes in the external environment.

Sources of educational working capital include the government, parents or guardians of students, the community, and other forms of assistance as stipulated in Law No. 20 of 2003 on the National Education System (Maharani et al., 2024). The diversity of these funding sources requires educational institutions to manage funds professionally and responsibly. The use of educational working capital covers operational costs, investment costs, and personnel costs Munir et al. (2023). These three types of costs must be managed proportionally to prevent an imbalance between meeting short-term needs and the long-term development of the institution.

The objectives of educational working capital management are to improve the quality of education, expand access to educational services, increase the efficiency of resource use, and ensure transparency and public accountability (Debataraja, 2024). With effective working capital management, educational institutions are expected to be able to provide high-quality, sustainable, and equitable educational services to all students.

3.3 Methods and approaches to working capital management policy

Methods for planning and allocating funds in educational working capital management include needs analysis, annual budgeting, setting priorities, and a participatory approach involving stakeholders (Safitri & Ramadan, 2022). Needs analysis is conducted to identify the most urgent and strategic operational aspects, while the preparation of an annual budget serves as a guideline for the systematic and measurable use of funds. Setting priorities helps educational institutions optimize limited resources, while a participatory approach encourages the active involvement of both internal and external parties, such as school principals, teachers, school committees, and the community. This approach aligns with the theory of participatory budgeting, which emphasizes transparency, collaboration, and decision-making based on shared needs (Andonoska & Alda, 2025).

The government's policy approach to managing education working capital is implemented through fiscal decentralization, public accountability, and the principles of equity and inclusivity (Mulyasa & Dyah, 2022; World Bank, 2018). Fiscal decentralization grants broader authority to local governments and educational institutions to manage financial resources in accordance with local characteristics and needs. Public accountability demands transparency and accountability in the use of education funds, while the principles of equity and inclusivity ensure that the management of educational working capital reaches all segments of society without discrimination. This policy reflects the practice of good governance in education, which emphasizes efficiency, participation, and public accountability in the delivery of education (Denhardt & Denhardt, 2015).

3.4 Efficiency and measurement of working capital in education

Efficiency in education financing is defined as the optimal use of financial resources to produce maximum educational output without compromising the quality of service

(Mulyono, 2019). This concept of efficiency emphasizes a balance between the amount of funds spent and educational outcomes, both in academic and non-academic aspects. Working capital efficiency can be measured through quantitative indicators such as the working capital ratio, cash turnover, cost per student, and the proportion of personnel costs (Halim, 2017). These indicators provide an objective picture of an educational institution's ability to manage liquidity, control operating costs, and maintain a sound financing structure.

Table 1. Indicators of educational financing and working capital efficiency

Type of indicator	Indicators	Measurement description	Sources
Quantitative	Working capital ratio	Measures an educational institution's ability to meet its short-term obligations using its current assets	(Halim, 2017; Masum, 2023)
	Cash turnover	Indicates the effectiveness of cash usage in supporting educational operations	(Halim, 2017; Rasyid, 2020)
	Cost per student	Illustrates the amount of expenses incurred by an educational institution per student	(Masum, 2023; Mulyono, 2019)
	Proportion of personnel costs	Shows the percentage of teaching and non-teaching staff costs relative to total operating expenses	(Rasyid, 2020)
Qualitative	Transparency in fund management accountability	Transparency in financial information for stakeholders Accountability for fund management in accordance with applicable regulations and standards	(Rohiat, 2019; Slamet, 2021) (Tilaar, 2020)
	Stakeholder engagement	Participation of internal and external parties in budget planning and oversight	(Rohiat, 2019; Slamet, 2021)

In addition, qualitative indicators include transparency and accountability in fund management, stakeholder engagement, and the impact of fund usage on the quality of educational services (Rohiat, 2019; Slamet, 2021; Tilaar, 2020). These qualitative aspects are crucial for assessing the extent to which working capital management is not only numerically efficient but also fair, transparent, and focused on improving the quality of education. Case studies by Rohmah (2022), Suryadi & Handayani (2021), and Rahmawati (2023) show that the implementation of program-based budgeting, digital reporting systems, and diversification of funding sources can improve the efficiency and stability of educational institutions' working capital, while also strengthening public trust in educational financial management.

Table 2. Practices for improving the efficiency of educational working capital

Researcher	Year	Management strategies	Key findings
Rohmah	2022	Program-based budgeting	Improving the efficiency and accuracy of fund allocation
Suryadi & Handayani	2021	Digital financial reporting system	Enhancing transparency and working capital stability
Rahmawati	2023	Diversification of funding sources	Strengthening the financial resilience of educational institutions

Tables 1 and 2 show that the established measurement tradition in education financing is concerned with liquidity, cost control, and transparency. None of these indicators registers the environmental consequences of operational spending. This gap motivates the next section, which extends the measurement logic to environmental, social, and governance dimensions. In particular, evaluating educational working capital efficiency

requires consideration of how financial resources are allocated alongside their implications for energy consumption, material use, and waste generation. Integrating these considerations can provide a broader basis for assessing institutional efficiency while maintaining educational service quality and supporting long-term environmental sustainability.

3.5 Integration of green budgeting, sustainable education, and educational working capital costs

The preceding sections show that educational working capital, budget efficiency, green budgeting, and ESD have largely been discussed in separate strands of literature. This section links them analytically through three connections. First, working capital is the part of an institution's budget through which recurrent resources such as energy, water, teaching materials, and maintenance are actually consumed (Alhamda & Karim, 2025; Yolanda & Karim, 2025); it is therefore the most direct entry point for green budgeting at the institutional level. Second, green budgeting supplies the environmental information and indicators that allow operational spending to be judged for ecological impact as well as financial efficiency (Wilkinson et al., 2008; Veancy & Bency, 2024). Third, the efficiency gains and sustainability-oriented practices that result are linked to green economic development through the human capital and green competencies that education develops (Huda et al., 2024; Lee et al., 2025). The Islamic values of *amanah*, *iqtishad*, and *maslahah*, together with the stewardship role of *khalifah fil ardh*, provide the normative foundation that holds these connections together (Samsuri, 2022). Figure 1 summarizes this logic, and Table 3 shows how the literature reviewed in this study supports each connection.

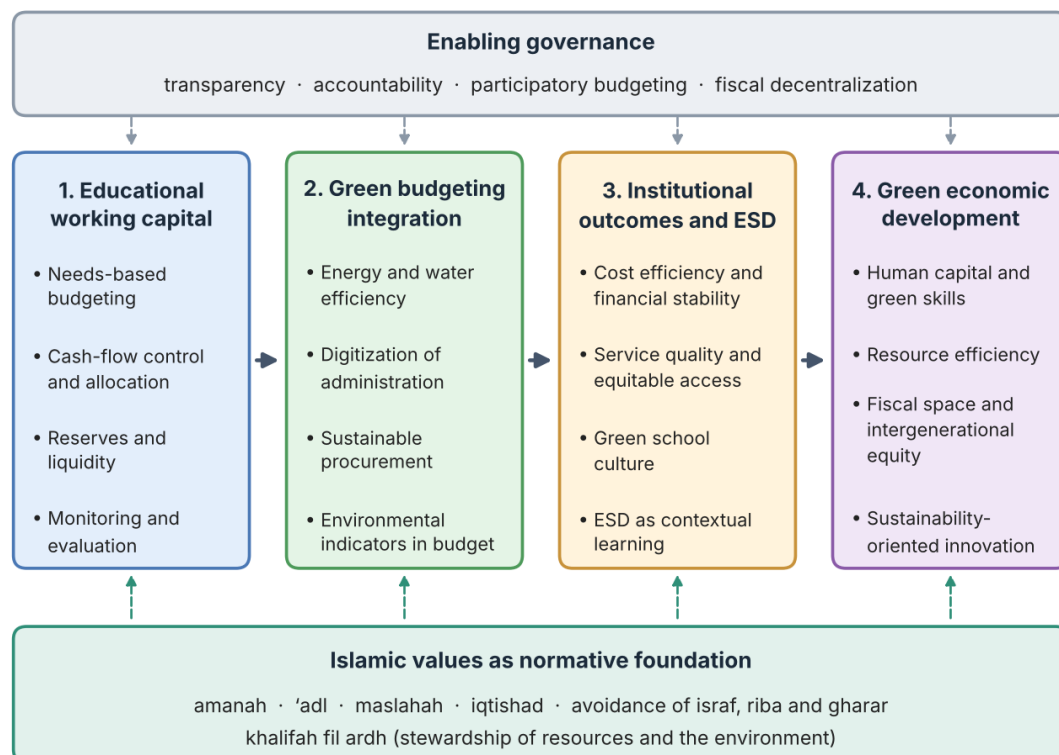


Fig. 1. Conceptual framework linking educational working capital, green budgeting, and green economic development from an Islamic education perspective

Figure 1 should be read as a chain of conditional links rather than as a tested causal model. Working capital management (1) provides the budgetary channel; green budgeting (2) directs that channel toward resource efficiency and environmental indicators; the resulting institutional outcomes (3) include cost efficiency, equitable access, and a green school culture that supports ESD; and these outcomes feed green economic development

(4) through resource efficiency and green human capital. Governance conditions—transparency, accountability, participatory budgeting, and fiscal decentralization—determine whether each link functions in practice, while Islamic values frame the purpose of the whole chain as stewardship of a trust (*amanah*) for the public good.

Table 3. Synthesis of the reviewed literature and its relevance to sustainable education financing

Analytical dimension	Sources	Main contribution as used in this study	Relevance to working capital and green budgeting
Working capital concept	Yolanda & Karim (2025); Alhamda & Karim (2025)	Define working capital as short-term funds for daily operations; stress cash-flow planning and control, liquidity, and reserves	Identify recurrent operational spending as the budget area where green budgeting can be applied
Financing models	Rukmana et al. (2025)	Discuss full public funding, pay-for-performance schemes, and needs-based subsidies	Show how funding design shapes equity and accountability in operational funding
Budget efficiency	Aulia et al. (2025)	Identify performance-based budgeting, transparency, and information technology as efficiency strategies	Provide instruments that can also carry environmental indicators
Islamic financing	Samsuri (2022); Fauzan et al. (2025)	Ground fund management in amanah, justice, transparency, and the avoidance of israf	Supply the normative basis that links efficiency with stewardship of resources
ESD and green schools	Arora (2025)	Describe green schools that integrate sustainability into energy, water, and waste management and curriculum	Indicate operational areas of working capital where sustainability can be practiced
Green budgeting	Aktaş (2023); D'Orazio (2025); Wilkinson et al. (2008); Bency (2020)	Describe green budgeting as integrating environmental objectives and indicators across the budget cycle, with transparency and accountability	Offer the framework for applying environmental indicators to education budgets
Education and green economy	Huda et al. (2024); Lee et al. (2025)	Show that education builds awareness, skills, and green financial literacy, and that universities support the low-carbon transition	Connect institutional outcomes to green economic development through human capital

Table 3 shows that each link in Figure 1 is supported by at least one strand of literature, but also that the strands rarely overlap. Green budgeting is documented mainly in fiscal and public finance studies, whereas working capital is treated mainly in educational financial management. The literature reviewed here does not report studies that apply green budgeting specifically to educational working capital. This confirms the research gap stated in the Introduction and indicates that the framework in Figure 1 is a contribution of synthesis rather than a restatement of established findings.

In the dynamic landscape of modern education financing management, educational working capital costs are no longer merely required to be managed efficiently from an economic perspective, but must also be responsive to environmental sustainability challenges. This demand has emerged alongside growing global awareness of the environmental impacts of organizational activities, including those of educational institutions. Green budgeting serves as a strategic approach that integrates environmental and climate change objectives into the entire budgeting cycle—from planning, implementation, and monitoring to budget evaluation (Wilkinson et al., 2008). This approach emphasizes the use of environmental information and indicators in budget management, ensuring that every allocation of educational funds is oriented not only

toward operational effectiveness but also toward minimizing the resulting ecological impacts (Veancy & Bency, 2024).

In the context of educational working capital costs, the implementation of green budgeting encourages educational institutions to manage their operational funds more wisely and sustainably. These practices are realized, among other things, through efficient use of energy and water, reduced paper consumption through the digitization of administrative and learning processes, and the maintenance of environmentally friendly facilities and infrastructure. Thus, working capital serves not only as a tool to support educational operations but also as a strategic means to internalize sustainability values in the governance of educational institutions.

Furthermore, green budgeting is closely linked to the concept of Education for Sustainable Development (ESD), an educational approach that equips students with the knowledge, values, and skills to support sustainable development. The implementation of green budgeting in education funding not only impacts financial efficiency and resource management but also serves as a contextual learning tool for students regarding sustainability practices. Through environmentally friendly funding policies, educational institutions can foster an institutional culture that is environmentally conscious and long-term oriented. This aligns with the view that green budgeting is not merely about allocating budgets for environmental programs, but rather an integrative effort to ensure that all economic and institutional activities do not lead to the waste of natural resources and to guarantee the sustainability of future generations (Veancy & Bency, 2024; Suwarli, 2015).

At the public policy level, environment-based budgeting is the responsibility of the government and public institutions to ensure the availability of adequate funding for environmental protection and management (Suwarli, 2015). Practices in various countries show that the implementation of green budgeting can improve the quality of fiscal policy while supporting the achievement of sustainable development goals. France, for example, implements green budgeting through environmental cost-benefit assessments, environment-based tax reforms, and integrated sustainable fiscal policies (Organisation for Economic Co-operation and Development, 2022). Meanwhile, China has developed a similar approach through green finance policies aimed at greening the financial system and directing investment toward environmentally friendly sectors. These international practices demonstrate that educational institutions also play a strategic role as part of the green economic development ecosystem through sustainable and environmentally oriented financing policies.

From an Islamic educational perspective, the integration of green budgeting into the management of educational operating expenses has a strong normative foundation. Educational funds are viewed as a trust that must be managed responsibly, efficiently (*iqtishad*), and directed toward the long-term public good (*maslahah*) for both humanity and the environment (Samsuri, 2022). Furthermore, the concept of *khalifah fil ardh* emphasizes that humans—including educational institutions—have a moral responsibility to maintain a balance between the use of resources and their conservation. Therefore, the implementation of green budgeting in the management of educational working capital not only improves financial efficiency and accountability but also strengthens educational institutions' contribution to sustainable development and the development of a just green economy.

To make this integration measurable and move the discussion beyond normative recommendations, Table 4 extends the conventional indicators presented in Table 1 across four dimensions: financial, environmental, social, and governance. The financial and governance indicators build on measures established in the literature reviewed above, while the environmental indicators capture the physical resource use associated with working capital expenditure, particularly energy, water, and materials. The social dimension complements these measures by accounting for implications for educational service quality and access.

Two cautions apply to the proposed indicators. First, environmental indicators should be assessed alongside financial indicators to ensure that reductions in utility expenditure

are not misinterpreted as efficiency gains when they result from inadequate service provision or compromise educational quality, consistent with the definition of efficiency adopted in this study (Mulyono, 2019). Second, the indicators are analytical proposals derived from the literature rather than empirically validated measures. Their thresholds, data availability, and validity must therefore be established through empirical research in specific institutional contexts. Future studies should also examine the feasibility of implementing these indicators across educational institutions with different financial capacities, infrastructure conditions, and governance arrangements. Such investigations would help refine the proposed framework and establish a more robust basis for assessing the contribution of sustainable education financing to environmental performance and long-term institutional sustainability.

Table 4. Proposed indicators for sustainable education financing

Dimension	Proposed indicator	Measurement	Basis in the reviewed literature
Financial	Working capital ratio	Current assets divided by short-term liabilities	Established indicator (Halim, 2017; Masum, 2023); see Table 1
	Cost per student	Total operating expenditure divided by number of students	Established indicator (Masum, 2023; Mulyono, 2019); see Table 1
	Utility cost share	Energy and water expenditure as a percentage of total operating expenditure	Authors' proposal; operationalizes the energy and water efficiency discussed by Arora (2025)
Environmental	Resource consumption per student	Electricity (kWh) and water (m ³) consumed per student per period	Authors' proposal; physical counterpart of utility spending
	Administrative digitization	Share of administrative processes digitized; change in paper procurement	Authors' proposal; follows the digitization practices discussed in Section 3.5
	Green allocation share	Percentage of operating and maintenance budget allocated to energy- and water-efficiency measures and environmentally friendly maintenance	Authors' proposal; applies environmental budget indicators (Wilkinson et al., 2008; Veancy & Bency, 2024)
Social	Equitable access support	Share of budget directed to needs-based support for students	Authors' proposal; follows needs-based subsidy models (Rukmana et al., 2025)
	Stakeholder participation	Involvement of principals, teachers, school committees, and the community in budget planning and oversight	Established indicator (Rohiat, 2019; Slamet, 2021); see Table 1
	Budget transparency and digital reporting	Availability of budget and realization reports to stakeholders through a digital reporting system	Established indicator (Rohiat, 2019; Slamet, 2021); see also Suryadi & Handayani (2021) in Table 2
Governance	Amanah and Sharia compliance review	Periodic internal review that ensures fund use avoids israf, riba, and gharar and benefits students and the community	Authors' proposal; operationalizes Samsuri (2022) and Fauzan et al. (2025)

Table 4 presents a set of proposed indicators for assessing the sustainability of education financing across four dimensions: financial, environmental, social, and governance. These indicators combine established measures identified in the reviewed literature with additional indicators proposed by the authors to address the specific

requirements of sustainable education financing. The financial dimension assesses the efficiency of fund utilization, while the environmental dimension focuses on resource efficiency and environmentally responsible budgeting. The social dimension emphasizes equitable access to educational support and stakeholder participation, whereas the governance dimension highlights transparency, digital reporting, and compliance with Islamic ethical principles. Collectively, these indicators provide a multidimensional framework for evaluating how educational institutions manage financial resources in ways that are efficient, equitable, transparent, and environmentally responsible. However, the proposed indicators require further empirical validation to establish their applicability across different educational contexts and institutional settings.

3.6 Policy mechanisms and implications for green economic development

From a development economics perspective, the relevance of educational working capital to green economic development can be understood through three conceptual channels. The first is resource efficiency and fiscal space: if energy, water, and material use in educational operations is reduced without lowering service quality, the funds saved can be redirected to other educational priorities, which is the long-term cost efficiency that green budgeting is expected to deliver in education budgets. The second is human capital: education that integrates sustainability develops the awareness, skills, and green financial literacy that support the transition to a green economy (Huda et al., 2024; Lee et al., 2025). The third is equity across generations and across social groups: needs-based financing and the stewardship principle of *khalifah fil ardh* both direct resources toward broad access today while preserving the resource base for future generations (Rukmana et al., 2025; Samsuri, 2022). The literature reviewed here does not quantify the size of these effects; the channels should therefore be treated as hypotheses to be tested, not as established results.

Table 5 translates the identified channels into concrete policy mechanisms by linking operational working-capital practices to policy implications and their expected contributions to green economic development. Three major policy implications emerge from this analysis. First, governments and regulators can integrate environmental performance indicators into existing operational funding and reporting instruments, including school operational assistance/*Bantuan Operasional Sekolah* (BOS) funds, as discussed by Sasmita & Samsinar (2024). Rather than establishing separate financing channels, policymakers can refine existing budgeting guidelines to encourage educational institutions to monitor energy and water consumption, identify opportunities for reducing operational costs, and report expenditures related to resource efficiency. Second, educational institutions can incorporate environmentally oriented allocations into needs-based budgeting and participatory planning, ensuring that environmental priorities are considered alongside academic needs and equitable access to educational resources. This approach can help institutions identify cost-effective sustainability measures while preventing environmental investments from displacing essential educational expenditures.

Third, Islamic educational institutions can draw on the principles of *amanah* (trust and responsibility), *iqtishad* (moderation and avoidance of excess), and *maslahah* (collective welfare) as an ethical foundation for implementing these measures and evaluating their outcomes through periodic accountability reviews. These principles reinforce responsible resource management, discourage excessive consumption, and encourage financial decisions that consider long-term institutional and community benefits. Collectively, the proposed mechanisms illustrate how sustainable working-capital management can support green economic development through improved financial efficiency, reduced resource consumption, and stronger institutional accountability. Potential economic benefits may arise when operational savings are redirected toward educational priorities, while resource-efficient practices can reduce environmental pressures. However, these contributions depend on effective implementation, institutional capacity, and the extent to which anticipated financial and environmental improvements can be demonstrated through measurable indicators.

Table 5. Policy mechanisms and implications of green budgeting in educational working capital

Mechanism	Operational practice in working capital	Policy implication	Contribution to green economic development
Energy and water efficiency	Monitor utility consumption and prioritize efficiency measures within routine operating and maintenance budgets	Include utility and resource-consumption indicators in operational budget guidelines and reporting	Resource efficiency and long-term cost savings that expand fiscal space
Administrative digitization	Replace paper-based administration and reporting with digital systems	Support digital financial reporting as part of education financing policy	Lower material use and greater transparency
Sustainable procurement and maintenance	Prefer environmentally friendly teaching materials, facilities, and maintenance practices when allocating routine funds	Include environmental criteria in procurement and maintenance standards for educational institutions	Demand for environmentally friendly goods and services; lower ecological impact
Budget transparency with environmental indicators	Report environmental indicators alongside financial realization	Adopt environment-based budget indicators within education budget cycles	Fiscal accountability that supports sustainable development goals
Equitable and needs-based financing	Allocate routine funds with attention to access and needs, not only to cost reduction	Combine efficiency targets with needs-based subsidies and inclusivity principles	Broader access to education and the human capital that supports a green economy
Participation and Islamic value-based oversight	Involve stakeholders in budget planning; apply periodic amanah and Sharia compliance reviews	Embed participatory budgeting and value-based accountability in the governance of Islamic educational institutions	Public trust and stewardship that sustain green initiatives over time

This study has limitations. As a conceptual literature review, it presents Figure 1 and Tables 4 and 5 as analytical proposals rather than empirically validated findings. Future research should examine the proposed relationships using institutional data on utility costs, working capital ratios, and educational outcomes; compare Islamic and non-Islamic educational institutions; and assess the feasibility and validity of the proposed indicators across different regions and educational levels. Further empirical assessment should also examine whether environmental improvements can be achieved without compromising educational quality, service provision, and equitable access. Such evidence is necessary to determine how the proposed framework can be translated into context-appropriate budgeting and accountability practices.

4. Conclusions

This study conceptualizes educational working capital management as a strategic process that connects financial efficiency, operational sustainability, educational service quality, and environmental responsibility. Effective management requires needs-based budgeting, transparent financial administration, and systematic monitoring to ensure that resources support institutional continuity and equitable access. Integrating green budgeting principles can extend conventional financial management by incorporating energy, water, and material use into resource-allocation decisions. From an Islamic educational perspective, the principles of *amanah*, *iqtishad*, justice, and *maslahah* provide a normative foundation for responsible, efficient, and accountable resource management.

The study contributes a conceptual framework, a set of financial, environmental, social, and governance indicators, and a mapping of policy mechanisms linking educational working capital management with resource efficiency and the potential contribution of education to green economic development. However, these contributions remain conceptual and require empirical validation. Future research should test the proposed relationships using institutional data and assess whether the framework can support financial sustainability, environmental responsibility, educational quality, and equitable access across different institutional contexts.

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Author Contribution

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References

Abuzayed, B. (2012). Working capital management and firms' performance in emerging markets: The case of Jordan. *International Journal of Managerial Finance*, 8, 155-179. <https://doi.org/10.1108/17439131211216620>

- Aktaş, E. E. (2023). Green budgeting and long-term fiscal sustainability. *IJOPEC Publishing*, 12. https://www.researchgate.net/publication/378805328_Green_Budgeting_and_Long-Term_Fiscal_Sustainability
- Andonoska, L., & Alda, E. (2025). Exploring budget surpluses: Budget absorption problems in recently decentralized macedonian municipalities. *International Journal of Public Administration*, 48. <https://doi.org/10.1080/01900692.2024.2421204>
- Arbo, P. & P. Benneworth. (2007). Understanding the regional contribution of higher education institutions: A literature review. *OECD Education Working Papers*, No. 9, OECD Publishing, Paris, <https://doi.org/10.1787/161208155312>.
- Arora, M. (2025). Making green schools a reality through economically sustainable strategies. *Journal of Education for Sustainable Development Studies*, 2(2), 146–155. <https://doi.org/10.70232/jesds.v2i2.51>
- Aulia, R. P., Suhardi, M., Sulistiawati, N., Angrani, J., Aprilian, I. D., & Solihin, M. (2025). Strategi perencanaan dan penganggaran pendidikan berbasis kinerja: Kajian literatur tentang efektivitas dan efisiensi penggunaan dana pendidikan. *Manajerial Jurnal Inovasi Manajemen Dan Supervisi Pendidikan*, 5(2), 497–507. <https://doi.org/10.51878/manajerial.v5i2.6394>
- Babalola, A., & Olawuyi, D. S. (2021). Advancing environmental education for sustainable development in higher education in Nigeria: Current challenges and future directions. *Sustainability*, 13(19), 10808. <https://doi.org/10.3390/su131910808>
- D’Orazio, P. (2025). Addressing climate risks through fiscal policy in emerging and developing economies : What do we know and what lies ahead ? *Energy Research & Social Science*, 119(July), 103852. <https://doi.org/10.1016/j.erss.2024.103852>
- Debataraja, B. L. (2024). Manajemen keuangan sekolah dalam meningkatkan mutu pendidikan. *Jurilma: Jurnal Ilmu Manajemen Indonesia*, 1(1), 57–62. <https://ejournal.rizaniamedia.com/index.php/jurilma/article/view/13/11>
- Denhardt, J. V., & Denhardt, R. B. (2015). *The new public service: Serving, not steering*.
- Fauzan, A., Utami, D. R., Noviarita, H., & Romlah. (2025). Rekonstruksi konsep manajemen biaya dalam pendidikan islam: Analisis efisiensi, transparansi, dan nilai syariah. *Kartika: Jurnal Studi Keislaman*, 5(2), 845–860. <https://doi.org/10.59240/kjsk.v5i2.173>
- Huda, N., Imron, M., & Maryoni, H. S. (2024). Increasing green economic growth through education and income levels. *Bisman (Bisnis Dan Manajemen) The Journal of Business and Management*, 7, 213–222. <https://doi.org/10.36815/bisman.v7i1.3188>
- Lee, C. C., Wang, F., & Lee, C. C. (2025). How does education promote green digital finance ? Evidence from China. *Financial Innovation*. <https://doi.org/10.1186/s40854-024-00688-2>
- Lyu, J.-Y., Lin, W.-B., & Wang, P.-S. (2025). Integrating green finance into vocational education: Curriculum design and implementation strategies for sustainable development. *American Journal of STEM Education*, 15, 23–44. <https://doi.org/10.32674/42dfnt47>
- Maharani, N. A., Hidayah, F., Darmawan, D., & Trihantoyo, S. (2024). Analisis sumber dan jenis pembiayaan pendidikan di Indonesia. *Jurnal Bintang Pendidikan Indonesia (JUBPI)*, 2(3). <https://doi.org/10.55606/jubpi.v2i3.3004>
- Mulyasa, E., & Dyah, W. (2022). Implementasi sistem penjaminan mutu internal di era merdeka belajar. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 08(May), 933–944. <http://dx.doi.org/10.37905/aksara.8.2.933-944.2022>
- Munir, M., & Kun Sholikhah, I. (2023). Jenis-jenis pembiayaan pendidikan. *CERMIN: Jurnal Manajemen dan Pendidikan Berbasis Islam Nusantara*, 2(2), 65–71. Retrieved from <https://ejournal.staidapondokkrempyang.ac.id/index.php/cjmp/article/view/331>
- Nsiah, J., Agyemang, A. O., & Bawuah, B. (2025). Advancing environmental performance in emerging economies: The roles of working capital management and capital expenditure. *Cogent Business & Management*, 12(1). <https://doi.org/10.1080/23311975.2025.2566902>

- Organisation for Economic Co-operation and Development. (2022). *Value for money in school education*.
- Saleh Presiden, A. V., Fitriani, N. I., Arianti, E., Wahyudi, M. A., & Nurkolis. (2026). Analysis of educational financing management based on management functions: Planning, budgeting, accounting, auditing, and reporting in primary schools. *Jurnal Ragam Pengabdian*, 3(2), 3717-3733. <https://doi.org/10.62710/ba7p6e60>
- Rizka, A. F., Ahmad, M., & Rochimah, H. (2025). Accountability and transparency of boss funds: An overview of financial management in public schools. *Journal of English Language and Education*, 10(4), 377-382. <https://doi.org/10.31004/jele.v10i4.1051>
- Rukmana, A., Amirullah., Hasan, I., & Aprilliantoni. (2025). Biaya-biaya dan pendanaan pendidikan: Kecenderungan dan dampak kebijakan. *Didaktik : Jurnal Ilmiah PGSD FKIP Universitas Mandiri*, 11, 217-227. <https://journal.stkipsubang.ac.id/index.php/didaktik/article/view/9436/5666>
- Sa'diyah, K., Pulungan, T. N., Siswanto, D. H., & Pisriwati, S. A. (2026). Strategic school financial management and its impact on educational quality: A participatory, transparent, and accountable approach. *Jurnal Ilmiah Manajemen dan Akuntansi*, 3(3), 01-09. <https://doi.org/10.69714/y4bsnf24>
- Safitri, S., & Ramadan, Z. H. (2022). Implementasi literasi budaya dan kewarganegaraan di sekolah dasar. *Jurnal Mimbar Ilmu*, 27(1), 109-116. <https://doi.org/10.23887/mi.v27i1.45034>
- Samsuri, S. (2022). Relasi manajemen keuangan dan kualitas lembaga pendidikan Islam. *Amorti: Jurnal Studi Islam Interdisipliner*, 1(2), 111-121. <https://doi.org/10.59944/amorti.v1i2.17>
- Rahayu, H. S., Amri, F., Maneges, G. A., & Nurdina, S. (2025). Literature review: Peran dana BOS dalam meningkatkan kualitas dan akses pendidikan. *CARONG: Jurnal Pendidikan, Sosial dan Humaniora*, 2(2), 790-798. <https://doi.org/10.62710/v1p4yc97>
- Singh, P. H., & Kumar, S. (2014). Working capital management: a literature review and research agenda. *Qualitative Research in Financial Markets*, 6(2), 173-197. <https://doi.org/10.1108/QRFM-04-2013-0010>
- Suwarni, Siska, J., Perdima, F.E., & Aurelio, S.G. (2026). Educational financing management strategy in improving the quality of school services. *International Journal of Learning Reformation in Elementary Education*. <https://doi.org/10.56741/iistr.ijlree.001507>
- Sugartini, P., & Jannah, K. I. B. (2025). Implementing sustainable practices in educational management: Challenges and opportunities. *Journal of Institutional Educational Management*, 1(1), 11-20. <https://jiemjournal.com/index.php/jiemjournal/article/view/2>
- Neha, P. G., Ihtiram, R. K., Gülsün, K. (2024). Virtual lifelong learning: Educating society with modern communication technologies. *Bentham Science Publishers*. <https://doi.org/10.2174/97898151965661240101>
- Wilkinson, S. B., Phillips, S. M., Atherton, P. J., Patel, R., Yarasheski, K. E., Tarnopolsky, M. A., & Rennie, M. J. (2008). Differential effects of resistance and endurance exercise in the fed state on signalling molecule phosphorylation and protein synthesis in human muscle. *The Journal of Physiology*, 586(15), 3701-3717. <https://doi.org/10.1113/jphysiol.2008.153916>
- Yolanda, M., & Karim, H. A. (2025). *Conceptual analysis of working capital management in education: An educational financial management perspective*. ICMIE Proceedings, July, 264-270. <https://doi.org/10.30983/icmie.v2i1.57>
- Zahirah, S. Y., & Suhaedi, W. (2025). Optimizing financial management and reporting to increase accountability and transparency in Islamic boarding schools. *Journal of Islamic Economics Lariba*, 11(1), 25-44. <https://doi.org/10.20885/jielariba.vol11.iss1.art2>

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