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Formulating Social Security Policy Models for Higher Education: A Funding Transformation for Inclusive and Sustainable Higher Education Access

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ABSTRACT

This study aims to formulate social security policy models for higher education financing to transform access into a more inclusive and sustainable system. Employing an integrative literature review method, this research critically analyzes policies and synthesizes findings from scholarly articles, government documents, and international reports. Inclusion criteria focused on studies addressing higher education funding mechanisms, social security integration, and comparative international financing models. The results indicate that while Indonesia has established an Education Endowment Fund valued at IDR 156 trillion, its current utilization is limited to 7–8%, covering only about 1 million students per year, leaving a significant accessibility gap for approximately 3 million potential students. The study reveals persistent challenges in equity, governance transparency, and fiscal sustainability. To address these gaps, the research proposes a comprehensive framework comprising three models: 1) an equitable revolving fund model using income-contingent student loans to ensure sustainable funding and minimize fiscal dependency; 2) a high-talented person scholarship model to strategically invest in exceptional individuals and prevent brain drain; and 3) an Educational Savings Model integrated with social security contributions (BPJS), empowering families to systematically prepare for higher education costs. Quantitatively, these models are projected to increase Indonesia's Gross Participation Rate (GPR) in higher education by at least 4% annually, surpassing the current growth rate of only 2% per year. The findings emphasize that transitioning to a social security-based higher education financing ecosystem enhances intergenerational equity, reduces long-term fiscal risk, and fosters national competitiveness.

1. INTRODUCTION

Education is a very crucial pillars in the succesfull development of a country. In fact, quality education has become a consensus in the 4th Sustainable Development Goals [1, 2]. One important aspect in realizing quality education is financing. At various levels of education, the financing aspect plays a very important role in supporting the expansion of accessibility and inclusivity of the community to receive education, including at the higher education level. Therefore, various countries in the world are trying to formulate and implement their respective policy strategies so that financing of higher education does not become a problem in realizing accessibility of higher education [3] which inclusive [4] and sustainable.

The pursuit of inclusive and sustainable higher education must extend beyond mere considerations of accessibility; it should equally prioritize the assurance of educational quality. Among Indonesia's younger generation, the issue of equitable access to quality education emerges as a significant concern. According to recent survey data, only 30% of Indonesian youth believe that quality education is accessible to all segments of society. This perception reflects a broader apprehension regarding systemic inequalities within the educational landscape. Moreover, 64% of respondents emphasized the critical importance of financial assistance—such as scholarships or other support mechanisms—in enabling access to quality education. This statistic underscores the extent to which economic barriers continue to inhibit educational opportunities. In contrast, a mere 6% of young individuals express confidence in their ability to independently obtain a high-quality education, highlighting the limited feasibility of self-financing pathways for the majority. These findings suggest a pressing need for policy

interventions aimed at enhancing both the affordability and quality of higher education in Indonesia [5].

In Japan, since 2004, public and private campuses have been given more freedom and autonomy to increase their own revenues by diversifying the channels they use to generate sufficient financial resources to increase the educational financing capabilities [6]. In the UK, over the past four decades, higher education has shifted from a primarily publicly funded system to a mixed publicly/privately funded system organised as a consumer market based on tuition fee loans [7]. In the United States, there is a "Federal Stafford Loan", part of which is provided directly by the government, and the rest is provided through banks or other lenders backed by a federal guarantee. The annual loan limit for dependent undergraduate students is $2,625 for first-year students, $3,500 for second-year students, and $5,500 for students who have completed two years of study [8].

Research on the theme of education financing policy is not something completely new. Several studies on similar topics have been conducted. For example, there are studies that examine underrepresented groups in higher education, who can be considered “equity target groups” [9]. There are also studies that analyze how government policies manage educational development from a top-down approach [10]. Meanwhile, there are studies that examine the prospects and tasks of innovative development of the national economy in the context of current globalization, as well as the main directions of improving the financing system of innovative activities. On the other hand, there are studies which examine the role of education financing in fulfilling and improving the internal quality of education effectively in accordance with educational quality assurance and conditions in the educational environment [11]. The various studies above have never examined how to formulate social security policy models for higher education in realizing a funding transformation for inclusive and sustainable higher education access. That is the difference, as well as the novelty of this research.

In Indonesia, a financing of higher education is still a major challenge. This is reflected in the low accessibility of people who receive higher education. Data from the Central Bureau of Statistics shows that the Gross Participation Rate (GPR) of higher education in Indonesia only reaches 31%. This means that out of every 100 people aged 19-23, only 31 are enrolled in college. Meanwhile, neighboring countries such as Malaysia (45%), Thailand (49%), and Singapore (91%) have achieved much higher participation rates [12, 13]. The data shows a significant gap and requires serious attention from various policy makers. The problem of the low Gross Participation Rate (GPR) does not stand alone.

Another obstacle related to financing higher education in Indonesia is the limited family economy. The cost of higher education, which includes tuition fees, living expenses, and other needs, is often beyond the means of low-middle income people [14] On the other hand, while the health and employment sectors already have social security through the Social Security Administering Body (BPJS) Health and Employment, higher education still does not have a similar system, even though Indonesia's education budget is much larger than the health budget [15]. As a result, access to higher education still depends on the family's economic capacity or limited government scholarship schemes [12, 16, 17].

This inequality is paradoxical, considering that the existence of BPJS for the health sector and for workforce protection has provided solutions in their respective fields. However, in Indonesia, there is no social security mechanism that can ensure that all levels of society have fair and sustainable access to higher education. On the other hand, existing education financing schemes, such as scholarships, have fundamental weaknesses. Most of the current scholarship schemes are “sinking funds” [18, 19]. This means that the funds given to scholarship recipients never return to the state treasury. In conditions where the number of scholarship recipients continues to increase, this condition poses a major risk to the sustainability of budget capacity. Funds that are used up without a return mechanism will increase the country's fiscal burden in the long term.

Meanwhile, the government has a responsibility to ensure equal access to higher education through the principle of “Intergenerational Equity” [20-22]. This principle emphasizes that the current generation has an obligation to provide equal opportunities for future generations to obtain higher education. Also, to ensure that challenges related to inclusive and sustainable access to higher education can be overcome. The persistent financing gap and limited higher education participation underscore the urgency of rethinking the current approach to educational equity in Indonesia. Addressing this issue requires not merely expanding budgetary allocations or increasing the number of scholarships but fundamentally redesigning the financial architecture to ensure systemic inclusivity and sustainability. By conceptualizing higher education access as an integral component of social security similar to health and employment protection, the state can shift from a reactive, subsidy-dependent model to a proactive, rights-based framework that guarantees equitable opportunities regardless of socioeconomic background.

Moreover, embedding higher education within a social security framework aligns with international best practices and theoretical principles of social justice and intergenerational equity. It reflects a commitment to protecting educational access as a shared societal investment rather than an individual burden. This strategic realignment offers a pathway to reduce fiscal vulnerability, promote intergenerational solidarity, and foster a more competitive and resilient national human capital base. In facing these challenges, a more innovative and sustainable policy approach is needed. Therefore, this research was conducted to formulate a social security policy model for higher education. The models produced from this research are expected to be an alternative strategic solution for funding transformation for inclusive and sustainable higher education access.

2. LITERATURE REVIEW

2.1 Social security

World Bank defines that social security refers to a set of policies and programs that aim to reduce poverty and vulnerability by promoting efficient labor markets, reducing people's exposure to risks, and improving their ability to manage economic and social risks such as unemployment, exclusion, sickness, disability, and old age [23]. Meanwhile, Organisation for Economic Co-operation and Development (OECD) defines social security systems as mechanisms that give assistance during a variety of life events, such as education, unemployment, illness, disability, and old age. These systems are critical for maintaining financial stability

and providing access to education and healthcare services [24]. On the other hand, social security can described as a society's ability to maintain its core identity under changing conditions and potential or acute dangers. More precisely, it is concerned with the long-term viability, under acceptable evolutionary conditions, of traditional patterns of language, culture, affiliation, religious and national identity and custom. There is also another definition that explains that social security is the provision of a secure social environment in educational institutions, which offers sociopsychological security and psychosocial well-being to both teachers and learners [25].

Throughout history, people have consistently sought social security and relief from hardship and want. The needs of people, their degree of social consciousness, the development of technology, and the rate of economic growth have all influenced this drive in different ways [26]. Social security can be used to support personal growth. Social security is sometimes viewed as a response to individual rights, but this encompasses more than just shielding people from unfavorable outcomes; it can also involve expanding a variety of opportunities or, at the very least, providing some protection against chances being reduced. There have been advantages to providing educational opportunities, for instance. The Educational Maintenance Allowance was designed to help members of low-income households continue attending school or college.

Social security, as defined by global institutions such as the World Bank and OECD, aims to reduce poverty and vulnerability by managing social and economic risks, and it also supports access to services such as education. Historically, social security has developed to ensure equal opportunity and personal development, with education seen as both a personal investment and a public good. Various financing models worldwide from income contingent loans to mixed or fully public systems attempt to balance access, equity, and sustainability, although they differ in integrating social security principles. The theoretical framework emphasizes education financing as a social contract rooted in intergenerational equity and social justice. In Indonesia, despite strong social security systems for health and labor, higher education lacks a comparable mechanism. Scholarship schemes remain primarily non-repayable “sinking funds” which risks long-term fiscal sustainability as demand grows.

2.2 Policy formulation

Policy formulation is definitely an important stage of the policy-making process. Certainly, designing the options that decision makers will evaluate has a direct impact on the final policy decision. This process also expresses and distributes power across social, political, and economic interests [27]. To create effective policies, it's important to integrate frameworks that align planning tools with risk reduction management [28]. Policy formulation is a vital stage of the policy-making process in which solutions are developed to solve identified social issues. It entails the interaction of knowledge-based analysis and power-based politics, which results in the formulation of viable policy solutions to achieve social goals [29].

Meanwhile, according to Zittoun et al. [30], policy formation involves finding and constructing policy alternatives to address an issue, then limiting them down to solutions before making a decision. This process often entails exploring questions about goals, priorities, available solutions, and the associated costs and benefits. On the other hand, according to Mukherjee et al. [31], effective policy formulation requires resolving internal inconsistencies within the policy substance as well as ensuring that the requisite capacities and capabilities are in place to carry out the design procedures.

Achieving both robustness and resilience implies the ability to create and implement policies using agile and flexible components and procedures. However, the degree to which such changes can be identified and correctly anticipated at the commencement of policy adoption is directly proportional to the level of 'turbulence' in the policy environment, therefore, it is not always evident a priori how much agility or redundancy is necessary. In such circumstances, policies must be flexible. In practice, this means that policies and policymaking necessitate not only greater and redundant resources, but also the flexibility to shift course as conditions change, such as built-in feedback mechanisms and procedures for automated or semi-automatic adjustment [32].

From a theoretical standpoint, integrating social security principles into education financing reflects a shift from viewing education merely as a commodity or a privilege to framing it as a social right. Frameworks such as welfare economics, social risk management, and intergenerational equity theory support this integrative approach. Welfare economics underscores the role of state intervention to correct market failures in education access and to promote social welfare. However, it has been criticized for sometimes neglecting long-term fiscal sustainability.

Social risk management theory emphasizes proactive measures (such as savings and insurance mechanisms) to mitigate future educational access risks. While conceptually sound, practical implementation (e.g., income-contingent loans) requires robust administrative capacity and strong legal enforcement. Intergenerational equity theory calls for current generations to ensure that resources (including education opportunities) are preserved for future generations.

While morally compelling, translating this into concrete policies (e.g., education endowments or revolving funds) demands institutional commitment and public buy-in. In this article, the discussion of social security in education financing reveals that while conceptual alignment with these theories is strong, operationalization in Indonesia remains limited. There is an evident need to shift from grant-based approaches toward models integrating repayment (revolving funds) and savings-based schemes to align better with social security principles and long-term sustainability.

3. METHODOLOGY

This study uses an integrative literature review. Integrative literature reviews are among the most effective vehicles for increasing knowledge and doing research in a certain domain. Integrative literature reviews are firmly rooted in a representative description of a topic, but also provide new insights through critical analysis and synthesis of the field's literature [33]. What characterizes an integrative literature review is the concentrated focus on a topical area [34]. Furthermore, the integrative literature review is a type of research that reviews, critiques, and synthesizes representative literature on a topic in an integrated manner, resulting in the generation of new viewpoints or frameworks [35].

This research was conducted from October 2024 to May

2025. The keywords in this research are policy formulation, public policy, social security, and higher education. Meanwhile, the data used in this study are secondary data from the Organisation for Economic Co-operation and Development, relevant journals, the Central Bureau of Statistics, and policy products (especially) the Law was then operationalized into Presidential Regulation Number 111 of 2021 concerning the Endowment Fund in the Education Sector. This study encourages inclusiveness in access to higher education, which is characterized by the expansion/increase of progressive participation in higher education for the Indonesian people. Conversely, the exclusivity of access to higher education occurs when there is stagnation (even degradation) in community participation in higher education.

On the other hand, the results and discussions in this study are divided into 3 main aspects: *First*, review results of the implementation of funding policies for access to higher education. In this aspect, various findings of data from literature that review/discuss the implementation of funding policies for access to higher education will be described. *Second*, critical analysis of the implementation of funding policies for access to higher education. In this aspect, the critical results of this research analysis will be reviewed based on the findings of data from literature that examines/discusses the implementation of funding policies for access to higher education. *Third*, frameworks of formulation social security policy models for higher education. In this aspect, social security policy models for higher education will be formulated. The formulation of these models is expected to be a trigger for realizing funding transformation for inclusive and sustainable higher education access.

4. RESULTS AND DISCUSSION

4.1 Review results of the implementation of funding policies for access to higher education

The government has established the National Education Development Fund (DPPN) since 2010, as described in Law Number 2 of 2010 on the APBN-P 2010. This statute establishes the DPPN as an educational budget with the explicit goal of creating an educational endowment fund. The major goal of this fund is to assure the continuity of educational programs for future generations, demonstrating a commitment to intergenerational equity [12]. The policy in the form of the Law was then operationalized into Presidential Regulation Number 111 of 2021 concerning the Endowment Fund in the Education Sector [36]. In terms of implementation, the following are the details of the policy settings: Definitively, the Endowment Fund in the Education Sector is a fund that is permanent in nature to ensure the continuity of education programs for the next generation that cannot be used for spending.

In terms of scope, the Endowment Fund in the Education Sector consists of: 1) Education Endowment Fund. This is a fund accumulated in the form of an endowment fund, including a national education development fund originating from the allocation of the education budget in previous years, the results of which are used to ensure the sustainability of education programs for the next generation, including Islamic boarding school education and religious education; 2) Research Endowment Fund. This is a fund accumulated in the form of an endowment fund, the results of which are used for research, development, assessment, and application to produce inventions and innovations; 3) Culture Endowment Fund. This is a fund accumulated in the form of an endowment fund, the results of which are used to support activities related to the advancement of culture; 4) Higher Education Endowment Fund. This is a fund accumulated in the form of an endowment fund, the results of which are used to support the development of world-class higher education in selected higher education institutions.

Meanwhile, in terms of funding sources, the Endowment Fund in the Education Sector can come from: 1) State revenue and expenditure budget. This is the annual financial plan of the Indonesian Government approved by the House of Representative; 2) Investment income. This is the result of the development of the Endowment Fund in the Education Sector; 3) Other legitimate and non-binding sources in accordance with the provisions of laws and regulations. This is a fund sourced from grants, results of cooperation with other parties, income from technology transfer from research results, royalties on patent rights, third party funds, trust funds, both from within and outside the country, and/or other sources. The Endowment Fund in the Education Sector is used to implement service programs, operations, and/or to increase the Endowment Fund in the Education Sector.

Furthermore, the Endowment Fund for Education (including the Endowment Fund for Islamic Boarding Schools) is used for service programs that include: 1) Degree and non-degree scholarships; 2) Increasing degree and non-degree competencies; 3) Research funding; 4) Religious education and Islamic boarding school education. On the other hand, there is an institution called the Education Fund Management Institute (Lembaga Pengelola Dana Pendidikan/LPDP) as an institution responsible for the development, distribution of development results, as well as the preparation of financial reports and performance reports for the development of the Endowment Fund in the Education Sector and the distribution of the development results of the Endowment Fund in the Education Sector in accordance with the provisions of laws and regulations.

4.2 Critical analysis of the implementation of funding policies for access to higher education

In terms of its conceptual structure, the policy related implementation of funding for access to higher education addresses several critical needs such as: ensuring long-term funding stability, promoting world-class universities, and expanding access for underrepresented groups. However, the critical analysis reveals several gaps and tensions:

First, **Equity vs. Excellence**. The policy heavily emphasizes supporting "world-class" universities through the Dana Abadi Perguruan Tinggi. While striving for international excellence is valuable, there is a risk that resources could become overly concentrated in elite institutions, potentially widening disparities between urban and rural or underprivileged groups. The promise of broader access risks being undermined by an implicit focus on elite performance. There are potential risk impacts on this aspect, including: 1) Widening Inequality. Concentrating resources on a few “top” universities can cause a growing divide between urban/rich universities and rural/smaller institutions. Students from remote areas may have fewer opportunities to access high-quality education; 2) Talent Drain. Students from disadvantaged backgrounds may feel pressured to move to

major cities, leading to brain drain from regional areas and regional development imbalances; 3) Public Perception Issues: Perceived favoritism towards elite institutions could erode public trust in the fairness and inclusivity of the national education system.

Second, **Access for Marginalized Groups**. Although the regulation mandates an affirmative policy framework (Article 5), there are limited clear mechanisms ensuring that the most marginalized (e.g., rural students, lower-income groups, indigenous communities) will benefit. Without robust monitoring and specific quotas or incentives, affirmative policies could remain symbolic rather than transformative. There are potential risk impacts in this aspect, including: 1) Tokenistic Inclusion: Without detailed guidelines, affirmative action efforts may become symbolic rather than effective, leading to continued underrepresentation of marginalized groups in higher education; 2) Unrealized Potential. Talented individuals from disadvantaged backgrounds could remain excluded from opportunities that could otherwise uplift their communities and contribute to national progress; 3) Social Frustration and Tensions. Lack of real inclusion may fuel resentment and distrust among underrepresented populations toward educational institutions and the government.

Third, **Governance and Accountability**. The reliance on the LPDP (Lembaga Pengelola Dana Pendidikan) for fund management ensures professional administration, but the layers of governance (Dewan Penyantun, Dewan Pengawas) add bureaucratic complexity. Transparency mechanisms are stipulated (Article 18), yet actual public visibility of fund allocations and program outcomes remains a potential weak point unless rigorously enforced. There are potential risk impacts on this aspect, including: 1) Inefficiency. Excessive bureaucratic procedures could delay fund distribution, hamper timely implementation of scholarships, research grants, and development programs; 2) Mismanagement. Without strong checks and public oversight, fund misallocation or fraud could occur, especially given the large financial size of the endowment; 3) Reduced Impact Visibility. Lack of transparency about how funds are allocated and used could weaken public confidence and reduce stakeholder engagement.

Fourth, **Integration with Broader Policy Goals**. While the regulation outlines areas for investment (research, culture, higher education), it is less clear how it integrates with national targets for educational access and equity under broader strategic plans like RPJMN (National Mid-Term Development Plan). There's a risk of fragmentation if endowment-funded programs operate in isolation from mainstream educational development initiatives. There are potential risk impacts on this aspect, including: 1) Policy Fragmentation: If the endowment programs operate separately from other national initiatives, there's a risk of duplication of efforts, wastage of resources, or contradictory programs; 2) Ineffective Outcomes. Without alignment, funding could support projects that do not meaningfully contribute to national targets for equitable education, reducing the strategic value of investments; 3) Strategic Drift. Over time, the focus of funded programs might drift away from national priorities, resulting in disjointed progress and lack of cohesive education development.

The endowment fund in the education sector since its formation in 2012 until now (2025) is worth around 156 trillion, but its utilization is only around 7-8% that can be used (around 12 trillion). If all of it (12 trillion) is a sinking fund, then it can only finance 1 million students/year assuming each student gets a tuition fee of 12 million/year. In fact, there are around 3 million more people in Indonesia who need to go to college. Therefore, the current policy cannot rely solely on/depend on the sinking fund to finance the remaining 3 million people. If forced, it will result in the fiscal space of the State Budget (APBN) becoming very limited.

4.3 Frameworks of formulation social security policy models for higher education

The existing policy related to higher education funding above is still a "sinking fund", meaning that funds given to scholarship recipients never return to the state treasury. With the number of scholarship recipients continuing to increase, this condition poses a major risk to budget sustainability. Funds that are used up without a repayment mechanism will increase the state's fiscal burden in the long term. In facing this challenge, a more innovative and sustainable policy approach is needed. One of them is by implementing a Revolving Fund-based student loan [37, 38]. This scheme allows students to borrow education fees that are returned after they work. The funds that are returned are then used to finance the next generation of students, creating a sustainable funding cycle and reducing the direct burden on the state budget. Thus, education investment can be more productive and continue to roll to support the education of the nation's children in the future.

In addition, the concept of Savings-Based Social Security for Education can be an alternative solution. Through this mechanism, people can pay premiums periodically to prepare for their children's higher education costs. This principle is similar to BPJS Kesehatan, where today's contributions guarantee access in the future [39]. With transparent and sustainable fund management, this concept can help ensure that higher education is not just a privilege, but a basic right for every Indonesian child. On the other hand, to support the development of superior human resources, the Scholarship scheme for High-Talented Persons is still needed. This scheme is specifically designed for outstanding students who have great potential to contribute to national development [40]. With full support for the best talents, Indonesia can produce future leaders in various strategic fields.

With the combination of these three schemes, the government can create a more effective, inclusive, and sustainable higher education financing ecosystem. This approach not only answers the need for current access to education, but also ensures the sustainability of funding for future generations, and emphasizes the presence of the state in educating the nation's life. The following are details of the three schemes (models) of formulation social security policy models for higher education, which are expected to be a solution for a funding transformation for inclusive and sustainable higher education access:

4.3.1 Equitable revolving fund model

Revolving fund is a sustainable funding mechanism where funds lent to students to finance higher education will be returned after they graduate and earn income. The returned funds are then channeled back to fund the next generation of students. With this principle, revolving funds create a sustainable funding cycle without directly spending the state budget. In its implementation, revolving funds require initial funds that can come from the Endowment Fund, government grants, or cooperation with financial institutions. After these

initial funds are channeled as educational loans to students, the repayment process is carried out in stages based on their income after working. This scheme is also known as "Income-Contingent Loan", where the amount of payment is adjusted to the financial ability of the scholarship recipient after entering the workforce.

In implementing the revolving fund scheme for financing higher education, policies related to grace periods and installment amounts need to be designed flexibly to suit the economic and social conditions of loan recipients. In addition to considering graduate income, the amount of installments also needs to take into account the number of dependents owned by related parties, such as: parents, spouses, children, or siblings. By considering the number of dependents, a more adaptive installment policy can be implemented, such as a temporary reduction in the installment amount until the financial condition is stable or an increase in the duration of the grace period before repayment begins. This approach ensures that the revolving fund scheme does not burden graduates excessively, but rather provides realistic support so that they can build a stable financial life while still meeting their loan repayment obligations. This flexibility will increase the level of payment compliance, reduce the risk of default, and ensure the sustainability of funds for the next generation of students. The framework of revolving fund model is shown in Figure 1.

According to Figure 1, conceptually, an income tax-based approach can be the main system for regulating repayment proportionally based on the debtor's income level. Installments are made automatically through monthly income deductions after graduates enter the workforce. In addition, the repayment policy is designed with a fixed rate approach, similar to the principles of Islamic banking, where the amount of repayment has been determined from the start and is not progressive. This policy can be arranged in three stages according to national economic conditions: 1) In low economic growth, repayment is made without additional fund management costs; 2) In case economic growth is moderate, part of the management costs can be borne by the government; 3) In high economic growth, debtors bear the full management costs. With this flexibility, the repayment system is designed not to burden graduates, especially in difficult times, while maintaining the sustainability of education funds for future generations.

In terms of repayment mechanism, student loans can be integrated with the Income Tax (PPh) system to ensure fair, efficient, and sustainable payments. This approach utilizes automatic deductions from the income of graduates who have reached a certain minimum income threshold. This system can be implemented through cooperation with the Directorate General of Taxes (DGT), where taxpayer (graduate) data is integrated with student loan debtor data. The main features of the control system through income tax include: 1) Proportional Based on Income. The amount of installments is determined by the income level of graduates. The higher the income, the greater the contribution, so as not to burden low-income graduates; 2) Automatic Deductions. Payments are made directly through monthly income deductions, similar to the PPh Article 21 deduction mechanism; 3) Minimum Income Limit: Installments only begin to be paid when the graduate's income exceeds a certain threshold, for example 4 million rupiah per month, to protect those who are still in the work transition period; 4) Monitoring and Transparency: This system is equipped with a digital portal [41] that allows debtors to monitor the remaining loan, payment schedule, and transaction history in real-time. This approach not only facilitates the repayment process but also prevents the risk of default, because payments are adjusted to the debtor's financial capabilities. In addition, integration with the tax system increases transparency and accountability in the management of revolving funds.

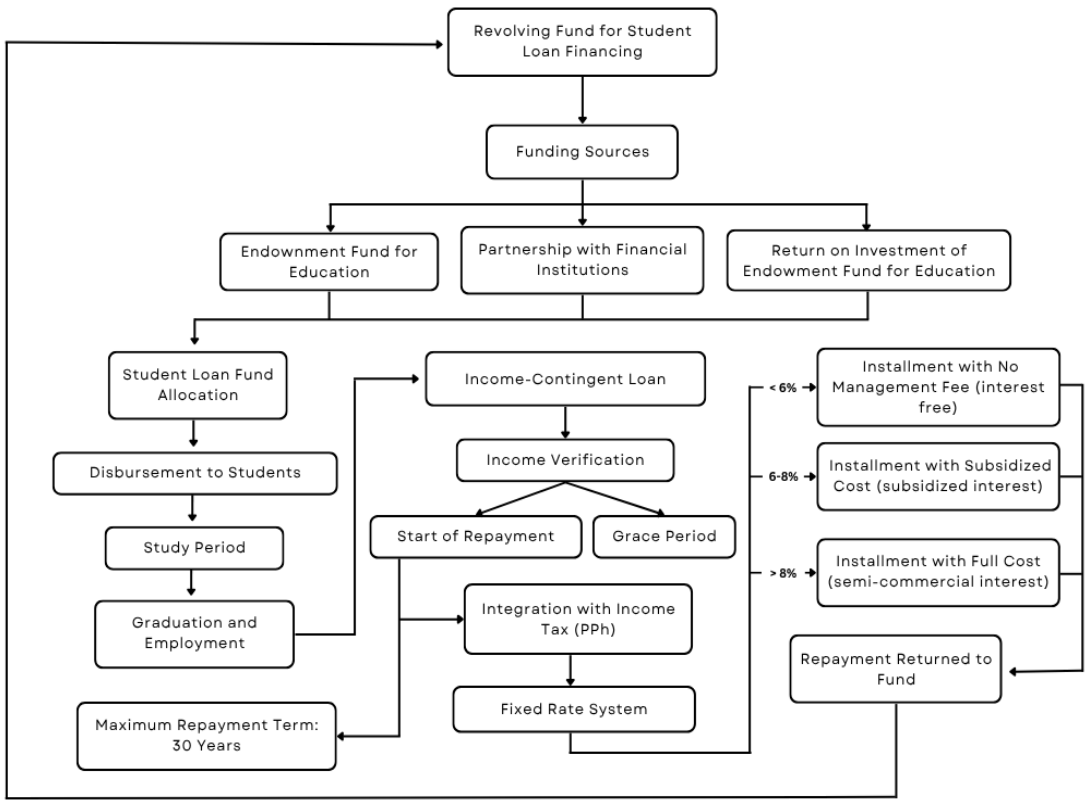

Figure 1. The framework of revolving fund model

The student loan return policy is designed with an adaptive approach to the national economic conditions. This approach ensures the flexibility and justice for student as a debtor by considering the financial capacity of the community at various levels of economic growth. This policy is divided into 3 stages with the use of a fix rate system, where the number of returns has been determined from the beginning and is not affected by changes in market interest rates. Phase 1: Returns without management costs (economic growth below 6%) - In this phase, the return only includes the principal of the loan without additional management costs. This policy is implemented when national economic growth is below 6%, reflecting unstable economic conditions. This approach aims to ease the burden of graduates who have just entered the workforce, allowing them to start a career without great financial pressure. This phase also provides space for graduates to build personal economic stability.

Phase 2: Returns with a subsidy of management costs (6%-8% economic growth)-When national economic growth reaches 6%-8%, the government provides subsidies for student loan management costs. In this scheme, the debtor only pays a small part of the management fee, while the rest is borne by the government. This approach provides a balance between eliminating the burden of debtors and maintaining the sustainability of education funds. This subsidy is also an incentive for graduates to continue to pay their obligations with full responsibility. Phase 3: Full return (economic growth above 8%) - In this phase, when national economic growth is above 8%, the return is done in full in accordance with the specified fix rate. This phase allows debtors to contribute greater to the sustainability of the education funding system without feeling burdened, given the supportive economic conditions. This policy reflects the balance between the debtor's financial capability and the need to maintain the circulation of loan funds.

There is obstacle potential in implementing the revolving fund model is the complexity of administrating and enforcing an income-contingent repayment system. This model's success hinges on the state's capacity to accurately monitor graduates' post-education incomes, ensure compliance, and efficiently collect repayments. In practice, Indonesia's labor market remains dominated by informal employment, where income is often irregular, underreported, or even untraceable. Integrating loan repayment with the national tax system demands sophisticated cross-agency data synchronization, robust digital infrastructure, and strong legal frameworks capacities that are still evolving within the Indonesian governance landscape. Moreover, the psychological acceptance of repayment obligations, even if income-based, may be low. Graduates might perceive the repayment as an undue future burden, potentially leading to strategic avoidance, migration to informal jobs to evade deductions, or non-compliance altogether.

However, from this model the government can provide "special policies for priority study" graduates from priority studies such as stem, health, defense, and agriculture continue to get a return policy without additional management costs (Fix rates without additional costs) in all phases of economic growth. This approach aims to encourage more individuals to take part in strategic fields that support national development and government policy priorities. The minimum income threshold to start the return is proposed of Rp. 8 million, adjusting to the inflation rate and the cost of living that continues to increase. In addition, this scheme determines the period of 30 years of return, providing certainty and justice for student loan recipients. During this period, permanent income-based payments are implemented, ensuring that the contribution of graduates is not a disproportionate burden. However, if after 30 years there are still remaining debt that has not been paid, "the debt whitening" mechanism will be applied. This bleaching is designed to overcome systemic payment failures, especially in cases where loan recipients face force majeure conditions such as permanent disability or long-term economic instability.

Although the revolving fund -based student loan scheme offers a more sustainable solution than a sinking fund traditional scholarship, it cannot be denied that the risk of failure from loan recipients remains a serious challenge. However, even in extreme conditions where 50% of student loan recipients did not succeed in paying back the loan, this approach is still better than a scholarship that fully consumes funds without a return. At least, in the student loan scheme, there are some funds that return to the state treasury and can be reused to fund the next generation of students. To ensure the success of the revolving fund scheme in Indonesia, the institutional strengthening of the Education Fund Management Institution (LPDP) as the main vehicle is crucial. LPDP has experience and capacity in managing educational endowed funds, so that the strengthening of investment management and LPDP governance will ensure optimal management results. Collaboration with the private sector and international institutions can also strengthen initial capital and guarantee the sustainability of funding. In addition, the application of the Income-Contingent Repayment scheme can provide payment flexibility based on graduate income and reduce the risk of failure. With this strategy, the revolving fund has the potential to be an effective solution to increase access to higher education that is inclusive and sustainable in Indonesia, as well as ease the burden of the state budget.

4.3.2 High-talented person scholarship model

Although the student loan based on revolving fund provides funding sustainability and ensures a refund for future generations, there is a strategic need to maintain a sinking fund -based scholarship scheme for individuals who have extraordinary talents. This scheme is designed to provide full support to individuals who have great potential and are considered capable of making a significant contribution to national development in strategic fields such as science, technology, health, defense, cultural arts, and sports. With this model, education investment is not only short -term, but is part of a big strategy to build superior HR ecosystems that support the nation's competitiveness on a sustainable development. This approach ensures that the nation's best talent has optimal support to develop their potential without being obstructed by financial obstacles.

In implementative projections, scholarships for high talented person (HTP) are given through a strict and transparent selection process. The selection criteria include extraordinary academic achievement, critical thinking ability, creativity, innovation, and leadership potential. The assessment must also consider the ability of prospective recipients to face and complete complex challenges in the future [42]. Thus, the government ensures that only individuals who truly have competitive advantages that get this support. This program is in line with the approaches applied in developed countries, such as the Public Service Commission Scholarship in Singapore and DAAD

Scholarship in Germany [43].

In addition to providing access to quality education, this scheme also aims to prevent brain drain. Many developing countries face challenges where the best talents they choose to work abroad due to lack of support and opportunities in the country [44]. Therefore, the government needs to ensure that scholarship recipients have a clear back contribution plan. For example, recipients are required to work in national strategic sectors or be involved in research and development that have a positive impact on the people of Indonesia. With this mechanism, the government can ensure that the investment provided through scholarships will produce Return on Investment (ROI) in the form of increasing the competitiveness of the nation [45, 46].

HTP is an individual who has extraordinary potential in making a significant contribution to national development in various strategic sectors. To identify HTP precisely requires criteria that include various dimensions, including: academic capabilities, innovation, creativity, leadership, social dedication, and strategic vision. This criterion ensures that scholarships for the HTP category are given to individuals who are truly superior and are able to have a broad impact on the nation. *First*, academic and intellectual achievement. HTP shows extraordinary academic achievements at the last level of education, both at the high school level and higher education. This criteria ensures objective and inclusive selection to identify the best talents throughout Indonesia.

Several main indicators include: report cards or final exam scores at high school levels with an average of 90 or the predicate equivalent to cum laude, according to national or international standards which include: 1) academic achievement at the national or international level, such as medals at the Olympiad of Science, Mathematics, or other awards; 2) College entrance selection scores (for example: UTBK, SBMPTN) which are in the top percentile nationally, showing high intellectual potential; 3) For students at the Bachelor Level and above, it can include a minimum GPA of 3.75 on a scale of 4.0 or equivalent academic awards, such as Dean's List or Awarding Student Awards; 4) Writing, research, or academic portfolio that shows the ability of analysis, innovation, and concrete impacts in certain fields of study. The framework of high-talented person scholarship model is shown in Figure 2.

According to Figure 2, the selection process for HTP is equipped with a centralized assessment conducted by the Social Security Institute for Higher Education. This assessment aims to ensure a consistent, transparent and just selection throughout Indonesia. The assessment component includes: 1) Standardly Academic Potential Test: Assessing the ability of logic, analysis, and problem solving that is relevant to the needs of higher education; 2) Personality and Leadership Tests: Measuring soft skills, such as communication skills, teamwork, and leadership potential. With this centralized assessment, the Social Security Institution can guarantee that every individual who is elected meets the criteria for superior academic and non-academic.

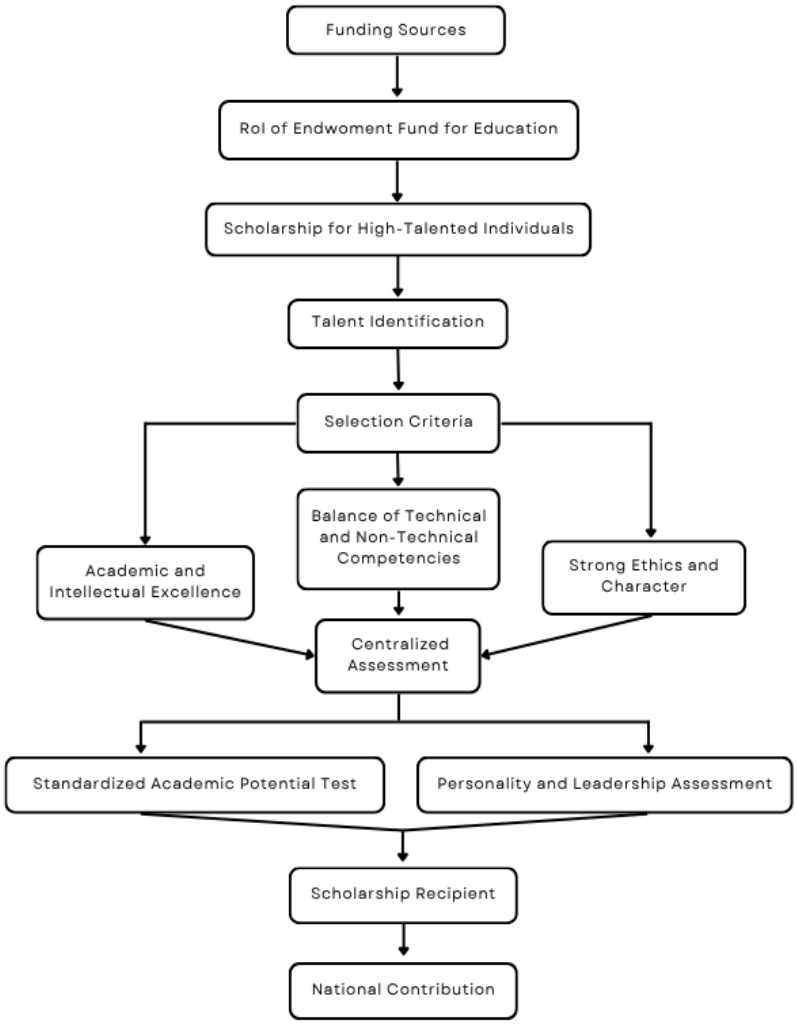

Figure 2. The framework of high-talented person scholarship model

On the other hand, this mechanism allows detection of talents that do not have full access to quality education, but have great potential to be developed. *Second*, the balance of technical and non-technical competencies. HTP is not only superior in technical capabilities but also has soft skills that support their success in various environments. This includes: 1) good communication skills, both verbally and in writing; 2) emotional intelligence and ability to adapt in complex situations; 3) Negotiation skills and project management. *Third*, strong ethics and character. HTP must show integrity, responsibility, and commitment to high moral values. This includes: 1) track record without academic or legal violations; and 2) dedication to the principles of sustainability, justice, and inclusiveness.

Meanwhile, there are obstacle potential in implementing the principal barrier to the high-talented person scholarship model lies in its potential to perpetuate or even exacerbate social inequities through perceived elitism. While this model aims to nurture exceptional individuals for strategic national advancement, its heavy reliance on competitive merit-based selection may inadvertently privilege students from affluent or urban backgrounds who already enjoy better access to preparatory resources, advanced schools, and supportive learning environments. This dynamic can deepen the rural-urban divide and reinforce existing socio-economic stratifications, thereby compromising the ethical foundation of equitable access to higher education. Moreover, the perception that the state prioritizes "elites" over the broader population could erode public trust and provoke social backlash, weakening the legitimacy of the entire higher education funding ecosystem.

4.3.3 Educational savings model

In the social security ecosystem of higher education, the education savings scheme has an important role as a long -term solution to ensure more equitable higher education access. Unlike the student loan based on revolving fund or sinking fund-based scholarship for HTPs, this scheme provides an opportunity for the community to plan the cost of their children's education through the mechanism of time savings. By setting aside a number of funds regularly, families can prepare education costs independently without depending entirely on government assistance or educational loans. To ensure the effectiveness and ease of implementing education savings schemes, educational premium payments can be united with the payment of Social Security Administration Body (BPJS) Health and Employment.

The government can establish a policy that a small amount of BPJS premium payment is automatically allocated for education savings. For example, of the total monthly payment of BPJS Health, around 2-5% can be set aside as an educational premium. With this integration, the public does not need to make separate payments, thus facilitating the administrative process and increasing participation in the education savings scheme. The framework of educational savings model is shown in Figure 3.

According to Figure 3, the integration with BPJS Employment can involve employers or companies to contribute to educational savings for their children's children. This policy can be an obligation for employers to set aside a small portion of funds as a form of investment in education for future generations. In this way, the company not only fulfills its social responsibility, but also helps ensure that their children's children have better access to higher education.

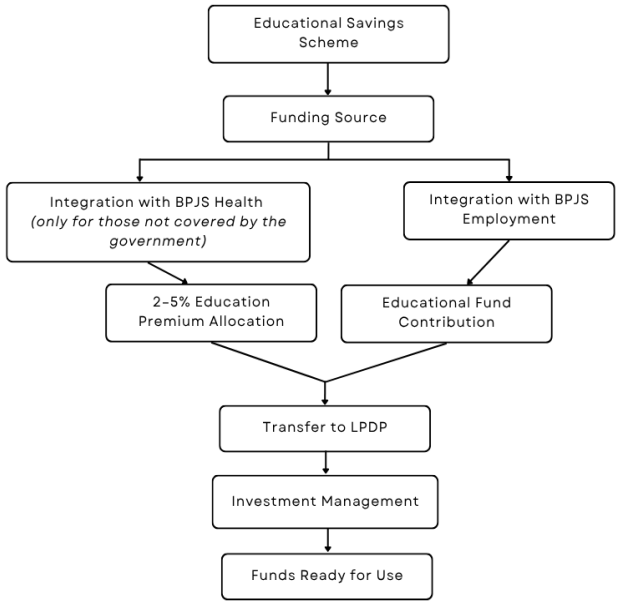

Figure 3. The framework of educational savings model

This approach will encourage synergy between governments, workers, and employers in creating sustainable educational funding ecosystems. Funds collected from the education savings scheme are deposited through the BPJS Health payment mechanism or BPJS Employment. In this system, a small portion of the premium paid by participants will be specifically allocated for education savings. Furthermore, to ensure more optimal and professional management, these funds periodically - for example every three months - will be transferred to LPDP as an institution responsible for managing long -term education funds. LPDP will then manage these funds through a safe and profitable investment portfolio, with the aim of maintaining the value of funds stable and protected from inflation.

With this approach, although the cost of higher education continues to increase, the value of education savings still has adequate purchasing power when used in the future. The integration between BPJS as a channel for revenue and LPDP as a fund manager ensures a synergy between government agencies to support the sustainability of education funding. This scheme provides certainty to the family that the funds they collect gradually will develop and are available on time to finance their children's tertiary education. In addition, this mechanism ensures transparency and accountability in managing funds, thereby increasing public confidence in the Social Security Program organized by the government. Maybe the question will arise, will this education savings scheme “crowding out” or reduce the effectiveness of other schemes such as student loans and scholarships?

The answer is no. Like the Indonesian people who have BPJS Health but can still use private health insurance, this education savings scheme functions as a basic safety net provided by the government. With this scheme, every family has basic access to prepare for their children's higher education without having to depend entirely on scholarships or educational loans. For people who have more financial capacity, they can still access student loans or scholarships to support more specific educational needs. This scheme is designed to ensure that there are no citizens left behind in access to higher education, as well as a strategic step for the government to increase the Gross Participation Rate (GPR) of

Higher Education in Indonesia. By increasing the GPR, Indonesia can strengthen global competitiveness and create a more productive and highly educated generation.

The integration of the education savings scheme with an existing social security system ensures that the government is present to provide minimum and sustainable educational facilities. This scheme is a concrete manifestation of the government's commitment in building intergenerational equity, where the current generation contributes to ensure a better future for education for future generations. The benefits of the education savings scheme are not only financial, but also encouraging long -term planning culture. By setting aside funds from an early age, the family is invited to think of the future of their children's education. This culture forms a more responsible mindset and reduces the risk of dropout due to sudden economic constraints. In addition, this scheme can help reduce community dependence on government scholarships or educational loans, create better financial independence.

There are obstacle potential in implementing the Educational Savings Model, the most formidable barrier is the weak culture of long-term saving and low public willingness to proactively allocate income for future education costs. In many Indonesian communities, especially among lower- and middle-income families, economic realities favor short-term consumption priorities over future-oriented financial planning. The absence of strong traditions of education savings, compounded by limited financial literacy and economic vulnerability, significantly hampers the willingness and ability of households to consistently contribute to an education savings scheme, even if integrated with mandatory social security contributions.

However, in the long run, educational savings schemes have the potential to strengthen the sustainable higher education ecosystem. With the collective funds collected from the community, the management institution can invest these funds to generate profits that support the national education program more broadly. This approach not only provides direct benefits for individuals, but also strengthens the overall education system with an independent and sustainable source of funding. As part of the Social Education Social Security policy, this savings scheme complements other approaches such as student loans and scholarships. With strong government support and transparent management, educational savings schemes can be an important foundation to ensure that every Indonesian child has quality higher education. In the end, this is an investment for the future of the nation, where each individual has the same opportunity to develop and contribute to the progress of the country.

4.4 A funding transformation for inclusive and sustainable higher education access

In facing the challenges of the low Gross Participation Rate (GPR) of higher education and the need to create more equitable access to education, the development of ecosystems through various alternative frameworks of the Social Security Policy Model is a strategic step that must be taken by the government. This ecosystem is designed to provide various inclusive and sustainable funding options, ensuring that every citizen has the same opportunity to get a higher education. The Multi-Instrument Approach to Social Security Higher Education, which includes a combination of student loans, scholarships, and higher education savings offers significant potential to increase the Gross Participation Rate (GPR) of higher education on an annual basis.

Through these 3 alternative models, it is projected to encourage the growth of the Gross Participation Rate (GPR) of higher education to reach a minimum of 4% per year, much higher than the current scheme which only grows around 2% per year. The projection of the increase in the Gross Participation Rate (GPR) of Higher Education reflects the expansion of access to higher education that is more inclusive, flexible, and sustainable. Multi-instrument policy models allow more layers of society to access higher education through schemes in accordance with their financial capabilities. The three main schemes that support this ecosystem are: student loan based on Revolving Fund, scholarships for HTP, and education savings. The details of the three models are based on various strategic aspects illustrated in Table 1.

Table 1. Transformative social security policy models of funding for higher education access

Aspect	Equitable Revolving Fund Model	High-Talented Person Scholarship Model	Educational Savings Model
Funding Type	Revolving (repayment-based)	Sinking (non-repayable)	Savings-based (self-funded)
Target Beneficiaries	General students needing financial aid	Exceptional talents with high national development potential	All families preparing for education costs
Sustainability Approach	Income-contingent repayments	Strategic investment in high-potential individuals	Collective community savings
State Fiscal Impact	Moderate (due to repayment cycle)	High (non-repayable scholarships)	Low (self-funding mechanism)
Long-Term Goal	Inclusive and sustainable higher education access	Strengthen national competitiveness	Foster financial independence and planning

The analysis of the proposed social security policy models underscores the importance of designing an integrated and adaptive financing ecosystem that addresses diverse societal needs. In this context, Table 1 serves as a comprehensive synthesis of the three key policy models, each offering distinct yet complementary contributions to higher education access and sustainability. By systematically outlining the differences in funding types, target beneficiaries, sustainability approaches, fiscal implications, and long-term goals, the table provides a clear comparative framework that highlights the strategic role of each model. Specifically, the equitable revolving fund model emphasizes repayment-based sustainability to ensure inclusive access without imposing a continuous fiscal burden on the state. The high-talented person scholarship model focuses on investing in exceptional individuals to foster national competitiveness and prevent talent loss.

Meanwhile, the Educational Savings Model empowers families to proactively plan for educational expenses, promoting financial independence and a culture of long-term

educational investment. Together, these models illustrate a multi-instrument approach that not only diversifies funding streams but also strengthens the social contract in higher education, reinforcing the principle of intergenerational equity. Through this integrative perspective, Table 1 acts as a pivotal conceptual bridge, linking the preceding critical analysis of policy shortcomings to the subsequent detailed elaboration of each model. It contextualizes the shift from isolated, unsustainable scholarship schemes toward a holistic, dynamic, and resilient policy framework that aligns with Indonesia's broader social and economic development goals. Each model has a specific role, and can complement each other. Student revolving fund provides an educational financing solution that allows students to pay back after graduation and work, creating a sustainable funding cycle. Meanwhile, scholarships are still given to individuals with extraordinary talents and achievements as a form of strategic investment in producing future leaders and innovators. On the other hand, education savings provide an opportunity for families to plan their children's education costs independently through payment of premiums integrated with BPJS Health and BPJS Employment. It is important to emphasize that the introduction of this multi-instrument scheme does not necessarily remove existing scholarship facilities such as the Indonesian Education Scholarship (BPI) and the Indonesia Smart Card (KIP).

Scholarship schemes aimed at vulnerable economic groups will be maintained and even strengthened to ensure that community groups with economic limitations continue to gain full access to higher education without obstacles. Thus, these models are designed as a complement, not a substitute, from existing schemes, in order to create a more holistic educational funding ecosystem, because it can have a positive chain effect on the welfare of the community and economic growth. More affordable higher education will produce more educated workforce, which directly increases national productivity and country competitiveness at the global level. In addition, an increase in the number of higher education graduates can encourage the growth of strategic sectors, such as technology, health, and creative industries, which contribute to sustainable economic development.

5. CONCLUSIONS

This research highlights the urgent need for a transformative approach to higher education financing in Indonesia to ensure inclusive and sustainable access. Despite existing policies like the Education Endowment Fund, there are critical gaps remain in achieving equitable access for marginalized groups, ensuring transparency, and aligning with broader national development goals. The current "sinking fund" scholarship policy model pose long-term fiscal sustainability challenges. The endowment fund in the education sector since its formation in 2012 until now (2025) is worth around 156 trillion, but its utilization is only around 7-8% that can be used (around 12 trillion). If all of it (12 trillion) is a sinking fund, then it can only finance 1 million students/year assuming each student gets a tuition fee of 12 million/year. In fact, there are around 3 million more people in Indonesia who need to go to college. Therefore, the study proposes an innovative social security policy framework comprising three models: 1) equitable revolving fund model through income-contingent student loans, ensuring sustainable funding with repayments adapted to graduates' income levels; 2) high-talented person scholarship model offering full scholarships to outstanding individuals to build national competitiveness and prevent brain drain; and 3) Educational Savings Model integrated with social security payments, empowering families to systematically prepare for their children's higher education needs. Furthermore, these models create a comprehensive funding ecosystem that balances accessibility, quality, sustainability, and equity. By implementing such a social security-based policy framework, the government can significantly increase its Gross Participation Rate (GPR) of higher education, strengthen intergenerational equity, and foster a more resilient, innovative, and competitive society. The government's role remains crucial in driving this transformation through effective policy, institution strengthening, and transparent governance. Ultimately, this funding transformation marks a strategic shift toward realizing the 4th Sustainable Development Goal: "Quality Education for All".

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