

Circular Economic Model to Improve Research Activities Efficiency and the Effectiveness of Indonesian Laws and Regulations Concerning Research

Toendjoeng Herning Sitabuana^{1*} Hazelya Tirza Djaja²

^{1*}*Universitas Tarumanagara, Jakarta 11440, Indonesia, tundjunghidayat@yahoo.com*

²*Universitas Tarumanagara, Jakarta 11440, Indonesia, hazelyatirza@gmail.com*

ABSTRACT

Higher education institutions are supposed to assume huge roles within the framework of nation-building through its 3 (three) main activities, namely education, research, and community service. The progress, however, could be very slow when carried out as a single, isolated entity. The current laws and regulations as well as international trend has suggested that higher education institutions operate in close collaboration with the industry, the government, and/or civil society, especially in fulfilling their mandatory research activities. This paper suggests further improvement by adopting the circular economic model widely adapted in the environmental law regime where efficiency could be maximized by leaving little to no research final or by-products to waste, along with attempts at changing public perspective in considering autonomy, collaboration, and commercialization in educational setting.

Keywords: *Higher Education Institutions, Research, Synergy, Circular Economic Model*

1. BACKGROUND

Public investment in education sector is believed to have positive influence to human resource productivity which is a most significant factor in paving the way to economic growth. The rate of return of investment in the education sector, both for private and public gains, is relatively high compared to other form of investments.[1] Unfortunately, the enormous investment spent annually on education by the Government notwithstanding, most research results carried out in higher education institutions are currently yet to reach its optimum level in terms of achieving its practical intention and objectives, both in fully contributing to the civil advancement and prosperity of the nation, State, and humankind, as envisioned in the laws and regulations, as well as in aiding the settlement of various social issues as often explicitly mentioned in the “Research Objectives” section of students research. There are spaces yet to be explored by the stakeholders within or in close connection with the higher

education institutions in order to maximize the development and utilization of research results in order to achieve the objectives in an efficient manner, allowing the laws and regulations to be rendered effective.

In the modern Indonesian context, the trend shows that education has gone through a shift of objective into becoming a consumption goods in a lifestyle which from time to time allow even more people to gain access to education.[2] The title or certification bestowed by various higher education institutions which was originally intended to formalize recognition to the possession of certain knowledge and/or skillset by the graduates to ease potential employers in carrying out assessments in recruitment processes is nowadays seen more as a determining factor of success or social status, which encourages a trend of vertical social movement (upward mobility), lifting the concerned individuals up to more respectable social positions. This is so much that it is not uncommon for families and/or individuals to strive to save for and fund

higher education with extra works, debts, and/or insurance to keep open the chance of access to higher education and, in the longer term, the improvement of social status.

This has caused an issue which remains underground yet unconsciously affect the community social relationship i.e., the prevalence of exclusive, privileged status of educated social group.[3] Without the bona fide manner displayed by the graduate concerned, coupled with the lack of social utilization of their knowledge for the benefit of the society and the nation at large, education will only exacerbate the already prevalent social gap. This has subjected the academia in general and higher education in particular to criticisms in the past decades, as well as the negative branding of higher education institutions as “ivory towers” which operate in isolation to the surrounding communities. This goes against the vision of Indonesian highly-esteemed national education pioneer, Ki Hadjar Dewantara, which in a statement declared that:

“Sebaik apa pun sistem pendidikan yang aku terapkan, tapi hal itu tidak akan pernah berpengaruh apa-apa jika tidak mendapat dukungan dari masyarakat. Oleh karena itu, untuk menyukseskan tujuan pendidikan Tamansiswa itu, maka aku berusaha keras untuk dapat menjalin kerja sama dengan lingkungan keluarga, lingkungan pendidikan, dan lingkungan masyarakat.”[4]

(No matter how fine an education system I implement, it would influence nothing if it gathers no public support. Therefore, to push the agenda of successful achievement of education objectives of Tamansiswa, I endeavor to form collaborations with families, academia, and the community).

In addition to the individuals concerned gaining only little gain from scientific research and report writing process (since in far too many cases these are ultimately carried out merely to tick out the graduation

requirements checkboxes in order to finally obtain academic titles and certifications), the higher education degree does not guarantee easy absorption of graduates into the workforce due to unmatched qualifications with regards to what said graduates could provide and the employers are seeking.[5] It is often the case that research results ended piled up untouched in the higher education institutions library or database, without particular attempts to utilize the contents.

Concerns arose when a couple years back, the Indonesian public was appalled by the media coverage of the burning of final research projects documentations by certain higher education institution, putting forward the excuse of limited spaces available for storage.[6] How ironic it is for our system to allow such waste when too many places across the country could benefit from receiving these excess and even utilizing the knowledge revealed through well-planned scientific due process in the research results. If nothing else, it could at least be a source of inspiration to try and solve various social issues in Indonesia.

Poorly coordinated transfer of knowledge (both among as well as between higher education institutions and the government, industry, and/or civil society) is one of the many issues behind the less than fully efficient national education system. Only few of the research results carried out by graduating candidates made way to solve real social issues, while the same amount of resources invested into such research goes only to ensure said candidate’s graduation. This is made even worse when no national database is made available to keep record of all past researches nationwide, giving leeway for duplication of the same research by other researcher(s). In a macro perspective, this is a total waste of resources (in terms of finance, time, and efforts).

2. ANALYSIS

2.1 Education as Publicly Supplied Private Goods with Externalities

In accordance with the *grundnorm* concept presented by Hans Kelsen,

Pancasila and the State Constitution of the Republic of Indonesia Year 1945 (hereafter referred to as “Constitution 1945”) is the superior basis for all inferior prevailing laws and regulations in Indonesia. The constitutional basis for the national education system itself is stipulated in Article 31, which ensure that the State would guarantee the access to and provide education services as the rights of the citizens. Education is set as the State’s core element in preparing an educated, high intellect generation for the nation with increasing level of spiritual belief, devoutness, and moral character. Such is the presumed importance of national education within the whole framework of nation-building that in 2002, the Constitution 1945 was amended for the 4th time to specifically allocate a minimum of 20% (twenty percent) of the annually proposed State Budget and Regional budget to fund the education sector.

Education service is by no means a pure public good since the marginal cost of education an additional person is far from zero.[7] In most cases, education becomes private goods albeit publicly supplied since, depending on the recipient, the gains derived could sometimes be enjoyed for strictly private interests such as in the case of the abovementioned individual upward mobility. Depending on the individuals concerned, the provision of education could render both negative and positive externalities. It is negative among others where significant discrepancies occur in the people’s prosperity as the result of said upward mobility, such as income gap, limited employment opportunities, etc. which in turn creates privileged groups, social gap, and envies. This could be internalized later by means of personal contributions in the workforce that helps moving the economy forward, as well as distributive means of social rectification such as subsidies and progressive income taxation system (this

will not be elaborated further for the purpose of this paper).

On the other hand, positive externalities could also arise where the empowerment of individuals is directed to bring social benefits (the expected return of investment) e.g., better behavioral manners inviting even foreigners to place investment, more empathetic and concerned citizens that strive to make the society a better place to live. When such positive externalities are internalized, the national education system (and consequently the nation as a whole) could generate additional benefits e.g., inflow of foreign students and investments.

2.2 *Synergy in the National Research Framework*

Higher education institutions are intended to assume a strategic role as part of the national education system in educating the population, encouraging knowledge and technological advancement while observing cultural values and humanity as well as sustainable human empowerment. Pursuant to Law Number 12 Year 2012 concerning Higher Education, its performance encompasses 3 (three) mandates (popular as *Tridharma Perguruan Tinggi*) i.e., to perform education, carry out research, and contribute in community services. The second (and occasionally the third) objective will be the subject of assessment in this paper.

While education intends to prepare and empower human resources to live a contributive life in the society, research activities per se is deeply and directly correlated with community services. Pursuant to Law No.12 Year 2012 concerning Higher Education Art.46 (1), the gains expected from the proper running and utilization of research are as follows:

- a. Assessment and production of knowledge and technology and

- refinement of learning;
- b. Improvement of Higher Education Institutions quality and the advancement of national civilization;
 - c. Improvement of national independence, development, and competitiveness;
 - d. Fulfilment of strategic needs within the national development framework; and
 - e. The transformation into a knowledge-based society.

A working synergy between higher education institutions, government, industry, and/or civil society is believed to be able to boost science, knowledge, and technology possession which will in turn increase national competitiveness and economic growth. Unfortunately, documentation on the national education system shows how poor the synergy level built in connection with Indonesia's higher education. As shown in the assessment carried out by the Ministry of Research, Technology, and Higher Education, the poor science, knowledge, and technology and national competitiveness shall be attributed to the low rate of interinstitutional research synergy implementation, resulting from the lack of clear and strict mechanism in the implementation (level) of coordination with regards to science, knowledge, and technology advancement policies.[8]

2.3 *An Assessment Into Higher Education Institutions-Industry Synergy Based on the Decision of the Constitutional Court of The Republic of Indonesia Number 103/PUU-X/2012*

In the past decades, there has been a trend of significant shift of autonomy in the provision and management of higher education from the State to the private sector i.e., the management board of higher education institutions. This is with the hope that a greater autonomy will set the higher education institutions in ways of greater freedom to explore their

respective potentials tailored to the needs of their surrounding communities and regions closest to their proximities. The complicated bureaucratic system involving micro managerial arrangement between higher education institutions and the Government has long been deemed a hindrance to fully developed, independent, and thriving higher education institutions.

This greater degree of autonomy including that of financial management as legally endowed through the provisions in the Law No. 12 Year 2012 concerning Higher Education has then been the subject matter of a review in the Constitutional Court of the Republic of Indonesia, where it is juxtaposed against the 1945 Constitution which is the superior basis for every laws and regulations in Indonesia. Simple as any other petition might seem on the surface, this phenomenon indicates a legal issue, possibly in terms of the legal substance i.e., the validity and by extension the social legitimacy (whether it aligns with the people's conscience and the living law) of such greater autonomy as well as the very concept of higher education institutions, government, industry, and/or civil society synergy which is highly correlated with the constitution and implementation of research polices of higher education institutions. In the end, social awareness, acceptance, and adherence (legitimacy) are the elements making up the legal culture, which will eventually determine how effective and efficient the policy implementation would be.[9]

According to Lawrence M. Friedman,[10] in order for a legal system to function well, there are 3 (three) main components that have to be in place and well-operating, namely the legal structure, legal substance, and legal culture. In most cases, Indonesia fails much too often on the last component, without which fine provision and performance of the first 2 (two) would be

rendered incapacitated. This begs the question *why*, and attempts have been made to unearth the source of problem and the possible means to rectify although with not much success, and a repetitive pattern of failures made up a rather apathetic public to deal with in terms of attempting any legal reforms.

The allowance of greater non-State autonomy for higher education institutions which include financial independency has been wrongly assumed as a means of the State to transfer its liability in national education providence to another parties. Despite the political background that might have come into play when deciding on greater autonomy for higher education institutions, it is widely accepted that greater educational institutions autonomy exercised well is not a bad thing per se; if anything, it could better promote academics freedom in thinking and creating knowledge, keeping the Government well at bay from influencing objective scientific assessment inherent in academic pursuit. Furthermore, higher institutions management carried out within the market context in a more corporate style could benefit from the efficient manner in which industries are known to operate, of course without neglecting the social justice aspect of higher education provision.

Despite a potential improvement in efficiency, the profit-oriented style adopted by corporations is deemed to potentially affect the objectivity quintessential to higher education institutions endeavors and is therefore considered harmful to their existence and reputation as independent entities. It seemed that upon hearing the idea of knowledge “commercialization” done in “autonomy” and close “collaborations”—that knowledge is somehow no longer used solely for human empowerment but is also extended and utilized to benefit institutions, businesses, and society in a lucrative manner—what comes to the

mind of a certain portion of the population is perhaps a profit-seeking endeavors with no regards to social justice and a tendency towards exploitation, as well as vested interests and less academic independence. Although this is not entirely true, history of past records have indeed shed negative light as to what effect a borrowed western concepts could bring to developing nations, and to ignore what potential foreseeable risks could arise will be a gross negligence.

However, attempts at developing and utilizing knowledge further and the various means of coordination and collaborations formed as the result of greater autonomy shall not be seen as an enemy to the education system. Aversion to risks while being well-grounded and justified looking back to the past, has and will continue to create a detached education system which is isolated from its surrounding, rendering it ineffective, outdated, and out of context. The post-colonial Indonesian legal system as Mochtar Kusumaatmadja blatantly put it,[11] could not be seen in isolation from the western legal principles (which are universally accepted by the international community); it is precisely our challenge to draw a balance between both our legal system heavily infused with western principles and the traditional principles and concepts specifically relevant to Indonesian socio-cultural contexts.

With so much potentials remain untapped by avoiding commercialization and greater higher education institution autonomy, it seems fitting to look forward and encourage each stakeholders to seek a middle ground where social justice is served as well as propelling the economic growth closer to the envisioned civilized and prosperous society. The society at the same time needs to reconsider conservative approach and start to admit the need of laws and regulations to assume a more progressive role as a tool of social

engineering [12] aiming to initiate societal changes through concerted social planning [13] and, no less importantly, to remain optimistic in seeing positive changes despite the discouraging record of repeated failures.

2.4 *Determination of the Scale of Priority in Public Policy*

Indonesia is a developing country with multiple sectors needing adequate attention in their respective development all at the same time. The political process and public support play huge parts in determining which sectors to prioritize over the others in a certain period of time. Five-years short term plans were made and annual budgets are proposed and approved, and in normal condition, the education system, the government, the industrial players, and the civil society are all good and settled in their respective sectors. Each operates and builds up respectively without the sense of urgency in developing and keeping their synergy alive. Occasionally though, attempts of building synergies are displayed and celebrated in the form of joint discussions, seminars, consultations, or competitions, which were carried out with a shorter-term vision that extends only towards the completion of said activities. Less is done to permanently maintain what connection has been formed which hopefully shows in how higher education institutions, government, industry, and/or civil society all work hand in hand to try and achieve and create something that is for the greater public's benefit.

The Corona Virus crisis has clearly shown how many sectors are yet to develop the resilience to thrive in ever-changing climate and are in need for extra attention and support. Only in this time of crisis, when multiple sectors compete for allocation of resources all at the same time, is allocation made according to the degree of emergency as the government contemplated and the

publicly (presumably) approved, perhaps sacrificing sectors with lesser degree of emergency along the way. However, all will do well to remember that such competition for resources have long existed even in a more normal situation, only it has yet to reach a level worthy of much public attention in the face of the many other more pressing issues the politics deemed important to highlight. Regulators/policymakers are constantly facing choices of priorities to make, including in terms of education provision, for the ultimate purpose of education is the empowerment of individuals and, by extension, the society, and there are multiple ways to achieve such purpose, research being only one among the many available means.

Efficiency aside, there are multiple aspects pertaining to a policy that requires sound discernment, among others the fulfillment of fairness/justice, the socio-political consequences, and the impact internalized in the education sector itself. However, policymakers will be wise to include efficiency assessment in the policy making process when facing resources limitations. Funds allocated for education, for example, are sourced from the annual State and Regional Budget as well as various grants. The latter is not to be depended upon since it relies solely on the generosity of the philanthropist and is therefore not sustainable by nature. The first, on the other hand, is the State priority and commitment by the Constitution, leading to the oft-romanticized term of education "eternal fund" (*dana abadi pendidikan*). This is essentially public money generated from tax collection which therefore requires transparency in its management and effectively targeted measures, as well as the production of as much impact as possible to bring the nation closer into the envisioned public objectives, such that the spending renders the policy enactment justifiable and accountable.

Add any dose of complacency and it will prove how a well-intended government support without visionary and concerted planning and implementation urgency at the national level in the provision of education tends to be taken for granted [14] and therefore losing too much potentials the national education system could otherwise recoup.

2.5 *Market Failure in Research Policies*

Their setbacks aside, attempts have been continually made to maximize education and industrial performance and with relatively good results. Yet there remains some potential losses in the lack of coordination and synergy between the higher education institutions, government, industry, and/or civil society. This has been pointed out to occur more often in less-developed countries, where for some sectors, the determination of national vision coupled with large scale, extensive planning and coordination by the Government is required to join forces of individuals who would otherwise perform just as well independently.[15] Better-coordinated synergies could be carried out in more intensive fashion not merely to seek the respective parties' interests, but to endeavor on achieving certain public interests on a larger scale.

From a national perspective, higher education institutions and other institutions conducting research are essentially carrying out similar activities that competitive industries are also doing i.e., research. It is through research that new discoveries are made to offer to the market or the public, or at the very least to unearth things that could potentially improve industrial performance (innovation). But industry and the greater public are ultimately the platform where researches are tested and the results brought further into development and incubation stage, undergoing feasibility study to test for market/public needs and acceptance, before implementation in the

larger scale population who would presumably benefit from the research.

Thus far, efforts to connect both sectors have been made albeit sparsely and intended rather to fulfill shorter-term visions e.g., completion of joint discussions, seminars, or competitions. In the face of market failure to bridge this prevalent gap between higher education institutions, government, industry, and/or civil society, the Government could assume a more intensive role to facilitate more permanent coordination and maintenance of network involving the aforesaid institutions, forming a pattern popular by the term *triple or quadruple helix model*. In Indonesia, this has been initiated with the establishment of the National Research Council (*Dewan Riset Nasional*) whose scope of work could be further expanded and potentially intensified into encompassing the abovementioned role.

It shall be observed at all times, however, that as with any other governmental institutions, government failure is not out of the equation in the implementation of Indonesian research regulations, the most prominent in the national education sector being redundant and rising costs.[16] Education (and research) is a politically popular sector to receive public funding; huge and even increasing amount of fund allocated to this sector could be misleadingly perceived as signaling a desirable increase of government attention and priority to education, while in reality it might just be that the spending becomes redundant (i.e., used to fund similar activities with no added gain to further education and research objectives) and is therefore unnecessary. This identification shall warn the government (as well as the public) that huge budget allocation is no accurate measure of the successful achievement of true education and research objectives.

2.6 Economic Approach as Solution

The behavior and choices made by rational individuals are constantly influenced by economical reasoning (human is believed to be *homo economicus*). Following the standard economic theory, [17] people are in constant state of facing trade-offs in life, costs are what is given up to obtain something else, rational people think within set boundaries, and people are generally responsive towards incentives. The economists measure input against the result of certain policy through the economic efficiency theory, [18] i.e., the optimum allocation of resources assuming a condition of scarcity, utilizing minimum amount of resources to generate maximum value (both in terms of quantity and quality). [20] Several ways to improve efficiency are through: [20]

- a. Achieving for the same output level with cheaper or less input or intervention;
- b. Increasing output level with a constant input level; and/or
- c. Reallocating the same resources for new input which will increase the output level.

It is the second variation that is particularly explored as solution in this paper, which will bring this to the next concept i.e., the circular economy model. In the realm of Environmental Law where it is borrowed from, the concept inherent in the circular economy model is to ensure that each stages in the production chain work in such an efficient manner that less or no waste of resource is produced with a maximum level of positive output. Derived from a previously linear model, with the ever-decreasing amount of available natural reserves which are essential to support human living and the increasing concerns towards the level of waste produced, limitations on resources utilizations were gradually put in place. In addition, various attempts were made

to minimalize waste through reduction of use, reusing and recycling of various production outputs into another usable forms. This concept was made popular by the slogan *reduce-reuse-recycle*.

Nowadays, the abovementioned concept is no longer deemed sufficient in facing the environmental crisis despite the continuous development to accommodate adequate environmental protection targets. Some institutions especially those located in Europe where the human rights to clean and healthy living conditions are taken seriously by setting and enforcing high standards, are well on their way to achieve significant (if not ambitious) emission reduction targets, even up to a zero-waste level within several coming decades. And this could only mean one thing: no resource should go to waste in the production chain, neither the final products nor the by-products, which shall all be seamlessly reused, repurposed, or reincorporated into the production chain in an integrated manner. This concept was then developed and called the *circular economic model*.

A huge potential of applicability in perspective, this model has been widely and officially promoted by the European Union in the past years and has been adapted into various public and private activities. With further development, the use of this model has progressively extends to improve fashion industry and sanitation system. This opens a whole range of possibilities for the model being applied into other sectors just as well, and the higher education is not exempted.

Research is a mandatory activity in higher education institutions and in fact is made a graduating requirement in most countries with no little amount of fund committed to be spent to cover through its completion, which for many is considered justifiable taking into account the (individual, and supposedly also social) benefits such activities could potentially generate. Conceptually, with

the same input level injected into higher education institutions in general and research efforts in particular, the output level generated by the national education system will multiply simply by placing the government, the industry, and the public in close proximity within a collaborative setting. This will improve the quality and relevance of research efforts previously carried out within the walls of higher education institutions since sufficient governmental, industrial, and public exposure will put said research efforts into national-social-industrial context and as close as possible to the development-commercialization stage of knowledge production, providing higher education institutions with access to the much-needed platform with larger scale access to the market as well as enabling them to make true social contributions (this is a desirable, positive research output with multiplier effect).

Depending on how far this scheme could go, commercialization has the potential to help recover the invested resources back to the corresponding higher education institutions (public or private alike), internalizing benefits for its long-term development in cyclical pattern. In the long term, this could contribute to a more sustainable higher education funding with increasing institutional independence.

Taking into account the possible aversion to “greater autonomy”, envisioned “collaboration”, and “commercialization” in the education sector which could potentially hinder effective achievement of research objectives, efforts shall be made to fortify the legitimacy of research interinstitutional synergies. This could be done by reducing oppositions, gathering supports, maintaining inclusive approach, and bringing each stakeholders to a point of common understanding that the less funding burden on the government part shall thereupon not be seen as a waiver of

government liability, but rather a potential to generate sustainable stream of funding (which shows a reintegration of education benefits into the education provision chain), while at the same time reducing the amount of research that is irrelevant or non-applicable in truly solving social issues (i.e., achieving zero waste level). In the long term, this will enable reallocation of State funding elsewhere still within the corridor of education and human empowerment e.g., building of sports and cultural facilities.

Therefore, infinitely more gain could be obtained nationally where researches are carried out in by higher education institutions members in close collaborations with the government, industry, and/or civil society who would benefit from said researches and where the results are successfully scaled up to the commercialization or application stage. For the part of the government, the industry, and the civil society, the resources (time, financial, and human resources) supposedly allocated to fund and carry out research and development activities could be potentially lowered since higher education institutions are expected to contribute at least partly to the efforts. This scheme of mutual take and give allows less to no research to go to waste, and both the final and the by-products of higher education institutions researches are internalized in the education production chain, rendering the entire system more efficient.

Better yet, the higher education institutions, government, industry, and/or civil society all could benefit even further from the endeavors by exacting the benefits each could potentially obtain out of a well-maintained synergy and commercialization, in line with the internal economic wiring of human being. By pointing the benefits out in tangible, quantifiable, preferably monetary value, they will each be able to see clearly the benefits a synergy and commercialization attempts could

render, think, and then decide for themselves without having to sacrifice independence or fear exploitation despite the changing dynamics in their respective operational culture.

3. CONCLUSION

Higher education institutions through its research activities are supposed to assume huge roles within the framework of nation-building. This, however, could only be very slowly progressing when carried out as a single, isolated entity. Running research activities in parallel are the government, industries, and the civil society, which need to bear the high cost associated with research and development. As an attempt at improvement, the final yield of the system could potentially be increased (socially and nationally speaking) by forming and maintaining their close cooperation which the government could do well to support by facilitating and setting out their respective roles and keeping the national vision towards economic growth and social welfare objectives in perspective.

This scheme could borrow the circular economic model widely adapted in the environmental law regime where efficiency could be maximized by leaving no research final or by-products to waste. To promote this scheme further, the Government could try and exact the benefits higher education institutions and the industry and/or civil society would likely to gain out of collaborative activities and research in particular as means of soft enforcement. In addition, it is quintessential that a change of public perspective be incited to prepare a legal culture that is more receptive to progressive policies meant for long term development.

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