

**Title: Strategies for Tertiary Education in PNG**

Authors: David Kavanamur, Lonnie Baki and Jeanette Baird

Affiliation: Office of Higher Education, PNG

**Abstract:**

The contribution of tertiary education to economic development is well-documented (e.g. World Bank, 2002; Bloom, Canning and Chan, 2005). However, studies on public investment in tertiary education show that many lower income countries struggle to meet the twin challenges of increasing access while also improving quality. As a consequence, increased public investment in tertiary education in these countries often leads to a fall in the resources available per student, because access is expanding rapidly (Millot, 2012). This is the situation in PNG. To meet these challenges will require innovation, efficient use of resources and accountability for outputs.

In our paper, we explore the enablers and strategies that could assist tertiary education to make a stronger contribution to PNG's economic development. We outline future projections in respect of Grade 12 school-leavers and available pathways for tertiary study, and discuss the unit costs of tertiary study for TVET and for higher education. We explore the ways resources are currently used, including the challenges for a tertiary sector that is expected mostly to provide housing for students and staff.

A multi-faceted strategic approach is suggested, involving re-balancing of provision between higher education and TVET, greater emphasis on maths and science, and institutional diversification. Better links to industry will be important, as will more transparent funding models tied to minimum standards. Other features include: provincial and national government co-operation; increased private provision and public-private partnerships; open access; more efficient use of resources; and expanded outreach programs.

## Introduction

The contribution of tertiary education to economic development is well-documented (e.g. World Bank, 2002; Bloom, Canning and Chan, 2005). However, studies on public investment in tertiary education show that many lower income countries struggle to meet the twin challenges of increasing access while also improving quality. As a consequence, increased public investment in tertiary education in these countries often leads to a fall in the resources available per student, because access is expanding rapidly (Millot, 2012). This is the situation in PNG.

We have been successful in increasing access to and success in school education but, without much greater investment in the upper end of education and in R&D, further human capital development in PNG will stall. Growth in our education sectors has been uneven and now needs to be rebalanced.

We face the further challenge of ensuring that future wealth creation takes place in an environmentally responsible and sustainable manner. PNG must boost its capabilities if we are to use and further develop the advanced research techniques for sustainability.

A post-secondary sector that is cost-effective and professional in producing both TVET and higher education graduates is needed. This sector must become highly competent internationally and needs to start its work now. To meet these challenges will require innovation, efficient use of resources and accountability for outputs.

In the next section of the paper we outline future projections in respect of Grade 12 school-leavers and available pathways for tertiary study. We then discuss the current approaches to funding and support of tertiary study for TVET and for higher education, including unit costs. Later sections of the paper address the enablers and strategies that could assist tertiary education to make a stronger contribution to PNG's economic development.

## School-leavers: projections and available pathways

There is an approaching crisis (already evident) for post-secondary education, as growth in school enrolments through to Grade 12 continues to far outstrip the growth in available post-secondary educational opportunities and in opportunities for waged employment.

The available opportunities for post-secondary education are found in the six universities, the State technical and business colleges, State primary teachers' colleges, State nursing colleges, some church-run colleges and institutes, and a fairly small number of private higher education and technical and vocational education and training (TVET) institutions. Most of these providers are small in scale. There are opportunities available through the UPNG Open College and similar arrangements at other State universities. Limited opportunities are available for apprenticeships, TVET training in Australia (the TVET SSP program), and the Asia Pacific Technical College in Port Moresby. Some students will go offshore to study, e.g. to the Philippines, Australia or New Zealand.

The school education system offers skills training through vocational training schools and centres, a precursor to further training and potentially a valuable pathway to advanced TVET programs but one that is as yet under-developed.

In 2013, 18,250 school leavers exited Grade 12 and only 4,074 were selected for post-secondary education of whom 3006 received Government TESAS (part-funding) scholarships. Of the 4,074 students, 50% were selected to universities, 21% to teacher colleges, 18% to technical and business colleges, 3% to nursing and 8% to miscellaneous colleges, as shown in Table 1.

Table 1: 2013 School Leavers Selected for Tertiary Study by Institutional Type

Institutional Type	No. of School Leavers Selected	%
University	2056	50%
Technical & Business College	737	18%
Teacher College	838	21%
Nursing College	136	3%
Miscellaneous	307	8%
Total	4074	100%

Source: OHE

Over the past decade the number of school leavers has increased at an estimate of 13% annually. New places in post-secondary institutions have not increased proportionately. In 2001, almost 50% of school leavers were selected for post-secondary institutions but the percentage ratio has declined over the years with only 22% selected in 2013. The numbers of Grade 12 school leavers will only increase over coming years and are estimated to reach 23,027 given the natural trend by 2016 (Table 2). The removal of an exit point at Grade 10 is estimated to double the current figures, to around 48,000 by 2016.

Table 2: School Leavers and Selections 2001-2013 and projections to 2016

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total number of School Leavers	4864	5825	7453	8387	9012	9213	11331	11473	12801	13089	13350	16373	18250	19027	21051	23027
Total School Leavers Selected	2400	2905	2849	2886	2977	3647	3316	4042	3975	3901	4420	4422	4074	4374	4418	4326
Total SL Selected & Total SL Ratio	49%	50%	38%	34%	33%	40%	29%	35%	31%	30%	33%	27%	22%	23%	21%	19%

Source: OHE

Apart from the total selected from universities mentioned above, the University of Papua New Guinea also enrolls school leavers in its Open College, to study by distance education. In 2012, UPNG enrolled a total of 6824 students in its Open College. The availability of more opportunities for open entry study through distance or online learning is an important component of strategies for the future.

While there are reasonably firm data on the number of students within State and some other higher education institutions, there is not yet any overall picture of the total number of students who are actually enrolled in or completing post-secondary educational

qualifications in registered – let alone ‘informal’ – institutions (see ACER, 2014, for the best available information on TVET provision). The actual standard of qualifications, especially those being offered below bachelor degree level, appears to vary widely and is only partially subject to any form of quality control or assurance.

School leavers need pathways into further education and training or into productive employment, or both. Without such pathways, there is an increase likelihood of social unrest: too many people with too much time, no prospect of waged employment and no sense of hope for a better future.

### Current approach to sector funding and unit costs

There is an immediate need for new business and funding models for PNG post-secondary education, to cater for rapid expansion but also to ensure the accountability of institutions to government for both the quality and the quantity of their outputs.

There is good evidence that many PNG institutions of higher and technical education (HTE), especially public institutions, are not receiving adequate funds – from all sources – to support properly their current numbers of students at an acceptable level of quality. In the public universities, which have taken on more students in recent years, average funding per student has fallen (Garnaut-Namaliu, 2010).

PNG’s State universities require a substantial level of assistance (both financial and technical) if they are to improve to international standards, as they have been unable to modernise themselves. The same concerns apply to other State institutions, especially to the primary teachers’ colleges and TVET colleges.

The TESAS Review of 2012 (OHE, 2012) identified K30,000 as the full average annual unit cost for a university student and assumed K20,000 as the cost for a student in a college. For most institutions, the fees charged are very much below the unit cost and in some cases maximum fees are imposed that are far below the costs of adequate provision.

If the sector is to take more students and improve its quality, its funding must be placed on a more sustainable and transparent basis and institutions must be enabled and encouraged to operate more efficiently.

University funding at present is a mix of annual Government appropriations, national Government and other scholarship funding, student fees and miscellaneous income. Appropriations are input-based and are used primarily for employee remuneration, with central government controls on the number of positions and remuneration. Funding for State colleges is similar but operational funding (apart from salaries) is minimal for teachers’ and TVET colleges. There are inequities in Government support to VTCs, State TVET and colleges and State universities, without any overarching rationale for the level of Government funding that particular types of institutions should receive for producing the same types of graduate outputs.

Existing government scholarships make a modest contribution to meeting the fees and other costs for students selected into universities, colleges and some institutes. In other cases, students sponsor themselves, with the help of their families or villages, or they may be sponsored in part by their provincial governments. There is a very tiny number of industry and corporate sponsorships.

Funding for capital development has been provided separately. It is 'lumpy' and unpredictable, making it difficult for State institutions to plan for expansion of places, as most need to provide housing for both students and staff. The housing burden is substantial and, arguably, detracts from the core education mission of these universities. There are, however, opportunities to provide staff housing more cost-effectively (CHE, 2013).

As well, there are significant barriers to more cost-effective or higher quality operations and to internal revenue generation. Universities are subject to controls that limit recruitment of highly experienced and qualified academic and professional staff, while State-funded TVET trainers are subject to controls over numbers and salary levels that make it difficult to recruit (DFAT, 2011), despite some evidence that employers would pay more if quality of training could be guaranteed (ACER, 2014). Exemptions from GST and import taxes are partial and utility and there are no concessional rates for utility charges. The Office of Higher Education is aiming to address some of these concerns but they will require assistance from other agencies and some changes to taxation measures.

Previous efforts by State universities to generate their own revenue streams have not been successful, although the private universities have demonstrated they can generate significant internal revenue. At present, opportunities for revenue generation in State institutions are constrained by limited internal resources and the absence of a business-like approach to institutional management. This could change over the medium-term, especially if State universities receive incentives to increase internal revenue from business operations.

### Enablers for educational opportunity and economic development

In order to provide more educational and employment opportunities for school-leavers, several key enablers will need to be brought into play. Three key enablers as identified in the National Higher Education Plan III are:

1. Coordinated sector governance and data collection
2. A willingness to engage in partnerships
3. Generation of SMEs for increased transactions and (self or other) employment.

The good news is that none of these three enablers involve massive costs to government. The bad news is that reform of public sector agencies and changing ways of operation are notoriously difficult to bring about.

Other background enablers include the reform of public services and utilities (BAI, 2014), to support well-functioning markets and cost-effective business operations, infrastructure for transport and stronger ICT systems. Infrastructure costs for transport are substantial but for these additional enablers, political will and committed leadership are the main requirements.

#### *Coordinated sector governance and data collection*

Governance of the PNG tertiary sector is a 'patchwork', lacking overall integration and coordination. Responsibilities are divided among several Government departments and agencies on historical lines, reflecting outmoded structural divisions that actually impede the generation of new educational pathways, e.g. between higher education and technical and vocational education and training. Even as simple a national blueprint as the PNG National Qualifications Framework has been splintered by agencies promoting separate 'TVET qualifications frameworks'. There is a need now to integrate and reinforce a coherent policy on qualifications at all levels from VTC to universities.

Within the higher education sub-sector, agency 'silos' reinforce rather than remove barriers between institutions e.g. between State teachers' colleges and other institutions that train teachers, and between nursing colleges and universities. The public service is one of PNG's largest employers, especially if the employees of State co-producers (hospitals, schools, universities) are included. Yet there is no overall plan for the professional development and training of officers and institutional staff engaged as public servants or quasi-public servants.

A new approach to overall sector governance is required, one that includes the departments and agencies involved in post-secondary education and training within an agreed framework. The approach needs to bring about the alignment of these agencies' strategies, to ensure they are all pulling in the same direction, and to provide incentives for effective coordination of policy, activities, programs and funding. This significant task is likely to require political will, a clear mandate and incentives to perform: 'highly effective coordination' could be considered as a potential 'high impact project' for all Government education agencies from 2015.

Another way forward would be to start with the development of integrated data standards, across higher education and TVET, to ensure comprehensive and comparable data for future planning. As a recent report on TVET in PNG stated:

'The information base for making TVET policy and monitoring progress is fragmented and particularly weak on data standards, and the whole field of financial statistics. Through collaboration those concerned could make some improvements in data collection, dissemination and use now. Further opportunities would open up within more unified arrangements for GoPNG regulation of the TVET sector, as mentioned above. If the key stakeholders can commit to collaboration, this is an area where small-scale technical assistance might have a big pay-off' (ACER, 2014, p. 155).

### *A willingness to engage in partnerships*

In addition to overall sector governance, departments and agencies responsible for post-secondary education need to be open to working in partnership with provincial and local level governments, churches and NGOs, the private sector and co-producing institutions. That is, sector governance needs progressively to embrace modern notions of networked governance (Stoker, 2006; Meek and Thurmaier, 2011), given the well-established models of intergovernmental activity in PNG under the Organic Laws and traditional partnerships with church and other NGOs. While there are many partnerships for school education, partnership arrangements for post-secondary provision tend to be more ad hoc and not especially well-documented. Importantly, good networked governance requires that partners have 'a seat at the table' when it comes to sector planning and monitoring. Some of our public service departments still appear more intent on 'command and control' models of sector planning (GoPNG, 2007) than on investing in the skills and approaches that foster collaborative ownership of policy and of plans.

Partnerships will also be vital for better quality assurance, practised cooperatively and collegially by government regulators and those institutions with a will to improve.

### *Generation of SMEs for increased economic transacting and (self or other) employment*

Provision of TVET and other workplace-based learning is one of the more cost-effective ways to provide opportunities for post-secondary education, training and workforce participation. However, by definition, much TVET requires its students to have or gain experience in actual workplace environments. To significantly expand TVET, employment or self-employment will need to be expanded at the same time.

The PNG Government recently has emphasised the creation of Small to Medium Enterprises (SMEs) as an engine of economic development and the generation of employment opportunities, including self-employment (ADB, 2013). A Government SME Policy is being developed and access to finance for SMEs is improving. If training opportunities are to increase, new SMEs will be vital enablers. Training in business development and management, as well as industry-based training could occur in parallel with SME creation, as suggested below.

### Multi-faceted strategies for the future

The enablers will provide a platform for future expansion of the PNG post-secondary education sector and set the stage for more cost-effective and quality-assured provision. Strategies for the future of course will need to be multi-faceted, involving:

- Re-balancing TVET and higher education, through diversification and new approaches to provision;
- Better standards of school-leaver achievement, especially in science and mathematics;
- A revised funding model;

- Integrated employment and training schemes; and
- A new narrative of quality as well as quantity.

These five strategies are briefly discussed below.

*Rebalancing TVET and higher education, through institutional diversification and new approaches to provision*

Provincial governments and politicians have recognised the need for development of their human capital and for the post-secondary institutions to do so. There is already a very strong push by certain leaders for the immediate roll-out of new post-secondary institutions, colleges and universities to serve individual provinces and districts. If access is to be increased significantly, however, these new places will need to become available even more rapidly than the already large natural growth in the school-leaver population.

While everyone wants a university, not least for status reasons, there are sound reasons for focusing on expansion of TVET over higher education, although growth in both sub-sectors is needed. Until the standards of school education are reformed, the majority of school-leavers will be poorly prepared for entry into, say, bachelor level programs. For many, starting their tertiary education with a TVET certificate will be a more affordable and more secure first step. PNG will continue to experience a significant skills shortage, so quality TVET is arguably the most important sector to address. This model could provide institutes of technology at provincial level with satellite operations or smaller training providers operating at district level and allowing more students to live at home while they study.

Diversification of institutional provision, to provide more local opportunities for the early years of study and very much more expanded outreach programs, should become a hallmark of the PNG post-secondary education sector. There will be more opportunities for non-State and private providers to partner with provincial governments, including established international providers. At the same time, provincial administrators need to know to check the bona fides of proposed new operators with OHE or with the NTC, to prevent the entry of 'diploma mills' or poor quality providers.

In the development of new institutes, there is a risk that governments will focus on the creation of new infrastructure and buildings at the expense of the most vital resource, which is qualified and experienced educators. There are almost certainly significant opportunities to use existing infrastructure more effectively within provinces and districts but there is likely to be fierce competition for good academics.

Online learning is a potential game-changer. As noted above, tertiary education business models are changing internationally. Our thinking in PNG needs to factor in changes in technology and needs for more on-demand 'bite-sized' learning (ref) that contributes to formal qualifications. Student learning in tertiary education does not need to be provided through one mode or, in many cases, through large periods of residential study away from

home. Higher education courses are becoming more modularised, content is freely available, and periods of practical experience, including volunteering, are valued.

The PNG Open University, which is planned to commence in 2015, will allow anyone with access to the post (or the internet) to enrol in tertiary education for a small fee. The challenge is how to ensure that PNG Open University learners are well-supported and encouraged to continue on to complete a qualification. Of course, we can also expect that over time many more PNG students will enrol with online providers overseas, provided their English language skills are adequate. On this point, it is likely that ‘tertiary preparation’ programs will find a home in PNG in future, to equip school leavers and those returning to study with study skills for further education.

We offer this sketch of an expanding and diversifying landscape of tertiary provision as a way of starting the conversation among agencies and providers on how and where Government funding for growth might best be directed.

*Better standards of school-leaver achievement, especially in science and mathematics*

One key driver of improved post-secondary education is school-leavers with broader and deeper capabilities, especially in maths and science. It is recognised that many PNG Grade 12 school leavers are poorly-prepared for tertiary study, particularly at university level (OBE Task Force, 2013). Tertiary institutions are now starting to focus on bridging or remedial programs but a more effective strategy is to improve the ‘product’ of school education.

To do so will require giving priority to improving the quality of teacher education in the primary teachers’ colleges especially, as by the time students reach secondary education they may already have fallen well behind expected levels of achievement.

Maths and science should be emphasised in both primary and secondary education, as they are key areas of knowledge for future careers in industry and good enablers for innovation in technical fields.

Since 2010, there has been a continuous decline in the number of students taking Advanced Maths at Grade 12. The declining number of Advanced Maths students, not all of whom achieve good grades, leads to further decreases in the number of students with Grade 12 Advanced maths being selected for post- secondary studies, as shown in Table 3.

Table 3: Proportion of Grade 12 Advanced Maths students and Total Selected

Year	Total G12 Students	Total Advanced Maths Students	Proportion of Advanced Maths Students	Advanced Maths Students Selected	Proportion of Advanced Maths selected
2010	13565	7739	57%	2344	17%
2011	14714	5166	35%	1944	13%
2012	16373	4722	29%	1604	10%

Source: OHE

There is thus an urgent need to ensure growth in the proportion of students taking maths and science to Grade 12 and succeeding in their studies. Similar considerations apply to English language proficiency.

An intervention strategy to raise the quality of teacher education must be implemented now, as it will take some years for the benefits of better qualified teachers to be realised. Recent announcements of European Union support for improvements to teachers' colleges are a positive development (Papua New Guinea Education News, 2014) but the PNG Government also needs to act. One challenge is that there simply are not enough well-qualified academics and teachers to provide better quality and more teacher education. In the short term, we may need to fund teachers from other countries to mentor and upskill our academics who train future school teachers. Alternatively, new models of teacher education may need to be experimented with.

#### *A revised funding model*

There is a growing recognition that the PNG tertiary sector – and the State sector in particular – needs to offer a compelling value proposition to government and others who invest in it. Otherwise these parties will choose to invest in other forms of provision. A value proposition needs to be developed, perhaps along the lines of 'The PNG tertiary education sector provides an agreed number and mix of graduates with relevant skills, at an acceptable international standard of quality and an affordable cost'.

The implication is that most funding for the sector should be tied to the production of graduates with relevant skills, plus research outputs for universities. The skill levels would range from Certificate 1 for TVET through to doctorates. Government funding for tertiary institutions can then be tied to an agreed mix of graduate outputs by discipline and level of qualification.

There is a need for additional support for research, especially in scientific and technological disciplines, which will be addressed in part through the new Science and technology Council.

The Office of Higher Education is currently modelling the new approach to funding. The model can be used to estimate the cost to government and others of 'purchasing' different numbers of graduates or of funding different types of programs. That is, funding would be based on the number of student places that are supported and the unit cost per place, with some supplementary support for student board and lodging.

Some level of private investment would be expected, and there are opportunities to make more systematic the support for tertiary students currently provided by many politicians and provincial governments. Under this model, the basis of funding would be set out in a Service Level Agreement between Government and each eligible tertiary institution, with specific conditions and performance incentives.

The model also needs to recognise new modes of delivery and the role of technology, which is changing tertiary education business models around the globe. At present, too much of

our planning is based on reproducing the existing, very high cost and low volume models of provision.

In time, a student loans scheme will be needed. A previous attempt did not succeed and it is likely that a future scheme would involve 'mortgage-type' loans that could be repaid over a period, rather than income-contingent repayments.

#### *Integrated employment and training schemes*

As indicated above, growth in SMEs is an important enabler. One future strategy for tertiary education could involve the provision of SME incubators or mixed employment-creation and training creation schemes. This will require the post-secondary education sector to work more closely with a range of government agencies involved in employment creation, not only the agencies responsible for industry and skills development. Youth employment schemes using public resources could, for example, integrate training and short courses eligible for credit for further studies.

#### *A new narrative of quality as well as quantity*

As in school education, past policy for post-secondary education has tended to emphasise quantity (or access) over quality. Both are important but access without completion of a qualification is a poor return on a substantial investment of money and time and completion of a qualification that is not recognised internationally is also a poor return. Future strategies for tertiary education need to emphasise and assure the quality of provision and student outcomes, not least for graduate labour mobility. All levels of government and partners need to agree on the need for systematic quality assurance and improvement of institutions and programs. Better-prepared commencing students will help but are only one component of enhanced quality.

#### Conclusion: A stronger contribution to economic development

Reform of the PNG post-secondary education sector is crucial for economic growth and development, but will require much greater coordination of approaches among government agencies and a commitment to engage more strongly in partnerships with other levels of government and all sectors of the economy. The structures and incentives for such coordination are not yet in place and, realistically, it may be some time before they are. In the meantime, individual agencies, such as the Office of Higher Education, can commit to trying to engage other government departments in joint policy development and agenda-setting while also building their relationships with providers and other partners.

New approaches to provision and more cost-effective ways of learning combined with more transparent funding models are required, but with so many forms of provision potentially available, governments at all levels will need some guidelines to assess which forms of

tertiary education might work best at provincial and at district levels, as the requirements vary.

A stronger tertiary education sector needs, as non-negotiable elements, better prepared school leavers and systematic, informed quality assurance arrangements.

The challenges for tertiary education, and the enablers and strategies for the future, are captured in the National Higher Education Plan III, which will be launched soon. This Plan sets out activities and initiatives under nine key goal areas, consistent with the enablers and strategies described above, namely:

1. Governance, Structure, and Coordination
2. Resource Management through Innovation
3. Research, Science and Technology
4. Academic Programmes and Quality Assurance
5. Access, Equity, Diversity and Output
6. Industry and District Alliances
7. Technical Education and Training
8. Internationalisation and Global Labour Mobility
9. Monitoring and Evaluation Framework.

The Plan was developed consultatively and the Office of Higher Education looks forward to discussing with stakeholders ways in which all agencies and institutions can contribute to achieving its aims.

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