

## **National online selection system in Papua New Guinea**

Martin Daniel

### **Abstract**

Many countries around the world are using information and communication technologies to improve their educational processes, thereby, attaining a significant reduction in time, cost and other resources, leading to effective and efficient educational service delivery. The Papua New Guinea (PNG) Department of Higher Education, Research, Science and Technology (DHERST) in partnership with PCG Academia developed an online system to improve the process of selecting suitable grade twelve school leavers applying to study at higher educational institutions. This paper provides a brief background of PNG higher education and DHERST. It also discusses the manual process of selecting school leavers and its challenges. The paper then discusses the online selection process (national online selection system) and its benefits. Lastly, it provides some suggestions for improvement and optimum use of the online selection system.

**Keywords:** admission pool, backup choices, educational services, algorithm, grade twelve school leavers (SLs), grace period, higher education, Information and Communication Technology (ICT), manual selection process, National Online Selection System (NOSS), online selection process, Papua New Guinea (PNG) National Department of Education (NDoE), PCG Academia, PNG National Department of Higher Education, Research, Science and Technology (DHERST).

## **Introduction**

Many countries are using information and communications technologies (ICT) to improve their educational processes, thereby gaining a significant reduction in time, cost and other resources, and leading to effectiveness and efficiency in delivering educational services. Many developing countries such as Papua New Guinea (PNG) are striving to adopt technological innovations to gain from the benefits of such innovations.

This paper will provide a brief background of higher education in PNG and DHERST. It will also discuss the manual process of selecting grade twelve school leavers (SLs) and its challenges. The paper will then discuss the online selection process (National Online Selection System, NOSS) and its benefits. Lastly, it will provide some suggestions for further improvement and the optimum use of the NOSS. The next section will now provide the background including the PNG Department of Higher Education, Research, Science and Technology (DHERST).

## **Higher education in Papua New Guinea**

Higher education in PNG is an important sector for national socio-economic development (DHERST, 2018c). Providing quality educational services could contribute to achieving some of the stated aspirations of the PNG Government.

DHERST “is the government agency responsible for coordinating higher and technical education and research, science and technology in [PNG]. [It works with various] agencies and other partners to provide the advanced skills, knowledge and innovation required for PNG’s sustainable social, economic and environmental development. [Its] vision [is] to serve and facilitate developments in the ... higher and technical education sector for economic, social growth and nation-building. [Its] mission [is] to provide the best policy direction and support systems to enhance

the quality, access and relevance of higher and technical education and research....” (DHERST, 2018d, para. 1 - 3).

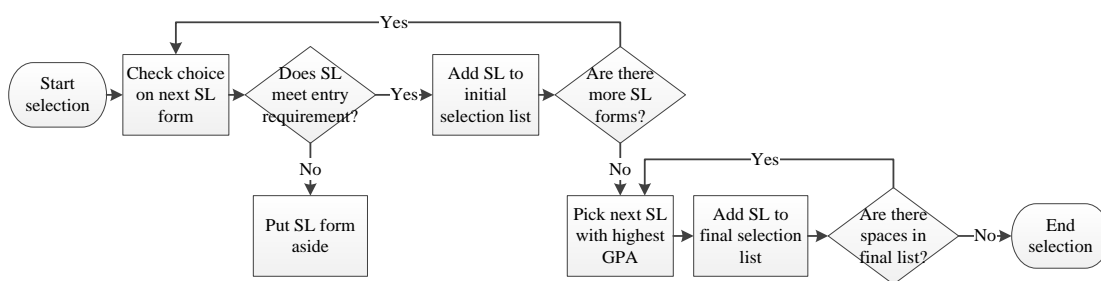
DHERST’s strategic plan has been developed “to guide the transformation, reformation and unification of the structure of higher education.... [It aims] “to improve the quality of education on offer in HEIs [Higher Educational Institutions and] that this will directly benefit the social and economic development....” (DHERST, 2015, para. 5 - 6). DHERST also aims “to help as many students as possible to gain entry to universities or colleges, to offer the quality of education and...help them succeed once they have enrolled. It means that our hardest work needs to involve finding the strategies...that will best enable students to meet their educational goals” (DHERST, 2018a, para. 2).

DHERST’s activities include the selection of SLs to study at HEIs. It seeks to improve the process, thereby, ensuring quality and equality selection. It also aims “to improve transparency, accountability, and most importantly increase the probability of capable and eligible school leavers in being admitted while ensuring [that] institutions’ autonomy in [the] selection process is maintained” (Papua New Guinea Today, 2017, para. 5). Therefore, an initiative was undertaken in 2017 to develop an online selection system to ensure optimal matching of candidates and programs of study at HEIs (DHERST, 2018c). This system was developed to improve the manual selection process. The next section will now discuss the manual selection process and its challenges.

### **Manual selection process**

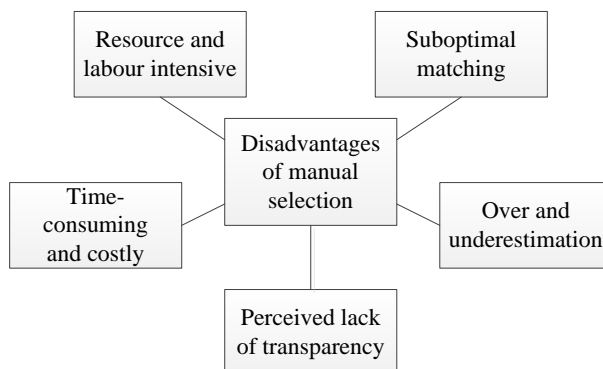
Before 2017, the whole process of selecting SLs for a program of study at their preferred HEIs was performed manually. With the manual process, a team of selectors from various institutions travelled to Port Moresby (PNG’s capital city) to select suitable SLs for programs of study at their preferred institutions based on

their choices (PCG Academia, 2017). “During the national selection, all HEIs select from candidates [SLs] who indicated their programs as [the] first choice, GPA being the main selection criteria. After the first round of selection, if there were some places left in the HEIs’ programs, [the] selectors added candidates [who] selected a particular institution as their second choice and later possibly from candidates who had indicated that they would be willing to accept other offers from similar fields of study” (DHERST, 2018c, para. 2) (Figure 1).



**Figure 1:** A simplified process model that shows how the selection of SLs is conducted manually based on the SL’s GPA and HEI program requirements.

The manual selection process had several issues (Figure 2). It was very slow, time-consuming, costly, and labour-intensive for DHERST and the HEIs. The manual process required a significant amount of resources and usually took several days to complete the selection. Further, the process led to suboptimal matching between SLs and HEIs’ programs. Many SLs often under or overestimated their academic potential, and “applied for programs for which they did not meet academic requirements...[and] lost their chances to be admitted to the less selective program. Some candidates, who passed exams with high GPA, apply for easier programs. Furthermore, manual selection of first and second choice candidates often led to missing better candidates” (DHERST, 2018c, para. 3). The process was slow in getting the results to the HEIs and selected SLs. Further, there was also a perceived lack of transparency and nepotism.



**Figure 2:** Some issues with the manual selection process

The manual process did not guarantee that all suitable SLs were considered with an equal chance of selection to a program of study at their preferred institutions. This led to many SLs not being selected in the manual process (DHERST, 2018c; PCG Academia, 2017). The above issues led to the development of the NOSS to improve the selection process, which will now be discussed.

### **National online selection system**

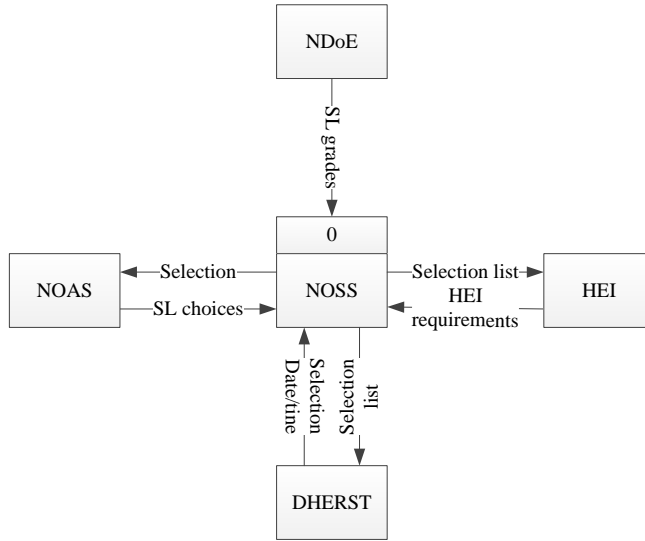
In 2017 (as previously mentioned), DHERST undertook an initiative to develop the NOSS through a partnership with PCG Academia (DHERST, 2018c; Kora, 2017; Papua New Guinea Today, 2017; Post Courier, 2017a, 2017b). The NOSS was developed to improve the selection process and increase the chances of selecting suitable SLs applying to study at HEIs. In doing so, DHERST aimed to improve transparency, accountability, timeliness, efficiency and cost-effectiveness of the admission, verification and selection process (DHERST, 2018b; Kora, 2017; Post Courier, 2017b).

In December 2017, DHERST launched the NOSS, which was developed by the PCG Academia (PCG Academia, 2017). PCG Academia has a vast experience in developing information systems for student admission and management in various

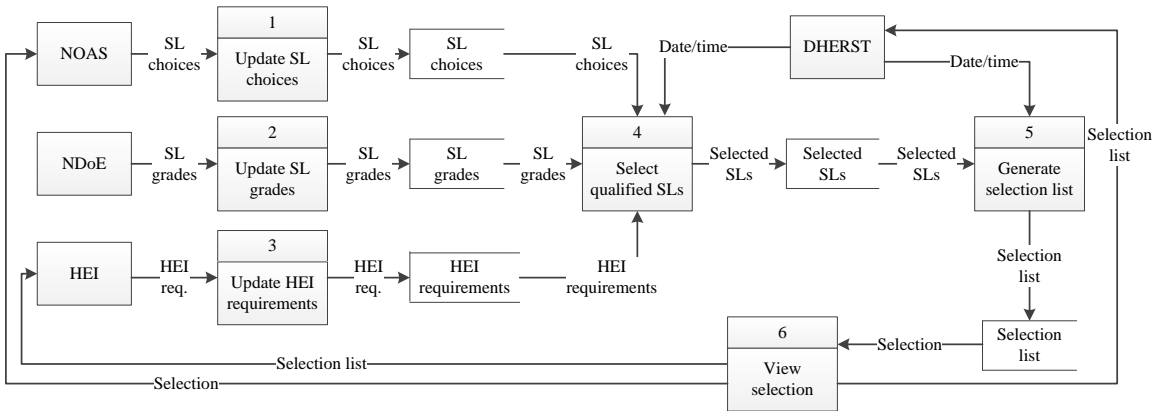
institutions around the world (DHERST, 2018c; Papua New Guinea Today, 2017; Post Courier, 2017a, 2017b). The first online selection resulted in about 47 per cent of all the SLs being selected to a program of study at an HEI (PCG Academia, 2017).

The NOSS considers all the SLs and selects suitable candidates by matching their choices (programs of study and their preferred HEIs) and grades against the program requirements of the preferred HEIs (PCG Academia, 2017; Post Courier, 2018) (Figure 3 & Figure 4). The system selects SLs to a study program at their preferred institutions based on their choices, grades and other requirements (e.g. quota) set by the HEIs (Loop PNG, 2018; Post Courier, 2018). These requirements are necessary to ensure that suitable SLs are selected (Study in PNG, 2019). The system is transparent, efficient and cost-effective. It also increases the chances of capable candidates being selected (Kora, 2017; Loop PNG, 2018) and ensures transparency, fairness and unbiasedness (Study in PNG, 2019).

The autonomy of the HEIs is maintained whereby the institutional requirements such as the program entry requirements, quota and other requirements are provided by the HEIs. The choices are provided by the SLs through the school leaver forms (SLF) submitted via the National Online Application System (NOAS) while their grades are provided by the PNG National Department of Education (NDoE) (PNG Insight, 2019; Study in PNG, 2019) (Figure 3). The NOSS uses this information to perform the selection and generate a list of suitable candidates for their program of study at their preferred institutions (Study in PNG, 2019) (Figure 4).



**Figure 3:** A simplified model (context diagram) showing the inputs (SL choices, SL grades and HEI requirements) and output (selection list) of an online selection system.



**Figure 4:** A model showing inputs (e.g. choices and grades), internal processes (e.g. Update choices and Perform selection) and outputs (e.g. selection list) of an online selection system. SLs (via NOAS), HEIs and NDoE provide inputs and view the selections generated by the system while SLs can view their selection using the NOAS.

The NOSS uses an algorithm, which compares the SLs’ parameters (grades and choices) against the HEI requirements, performs the selection and generates a list of suitable candidates (DHERST, 2018c; PCG Academia, 2017). Apart from the grades, the HEIs may have other requirements, which are usually made

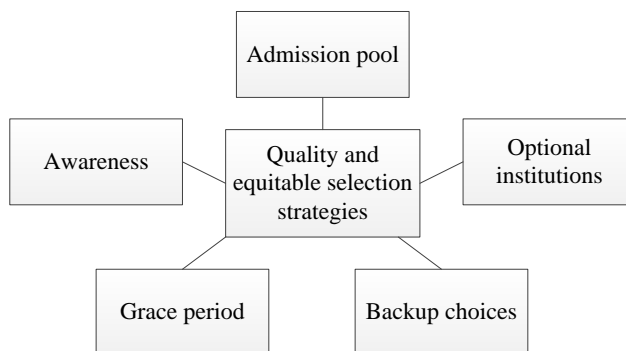
known to DHERST, the schools and their students (SLs) (Study in PNG, 2019).

When the NOSS was developed, awareness about the NOSS was provided through various means such as media. Trainings and workshops were conducted to train the selectors (HEI staff) on how to use the system (PCG Academia, 2017; Study in PNG, 2019). Seminars were provided to the stakeholders including the HEIs to show how the system works (Papua New Guinea Today, 2017; Post Courier, 2017a, 2017b). A helpdesk was also established in DHERST to attend to queries regarding the online selection (Post Courier, 2018).

Some concerns were raised by some SLs, who claimed to have had good grades or met the program entry requirements but were not selected by the NOSS. For example, an SL claimed to have scored an A in a subject and Bs in other subjects and applied for a business-related program at an HEI but was not selected (Nazel, 2018). An SL may have not been selected due to several reasons including (1) the program quota may have been reached by the already selected SLs with higher or similar grades or (2) the choices may have not been prioritized properly, with the SLs overestimating their academic potential (Post Courier, 2018).

Several strategies were implemented to ensure fair and quality selection, giving the SLs with good grades equal chances of being selected (Figure 5). The NOSS provides other options, institutions that offer similar programs, to ensure that the SLs are treated fairly and justly without any biases, giving equal chances of being selected (Post Courier, 2018).





**Figure 5:** Several strategies were implemented to ensure quality and equitable selection of students with good grades.

An admission pool was implemented to contain the SLs who are not selected, placed according to their academic performance, but meet the entry requirements of a program of study. The institutional selectors can access the admission pool and manually fill in spaces in their programs usually after the national selection or during registration when the selected SLs fail to register at the beginning of the academic year (Study in PNG, 2019). The SLs who are not selected are also advised to approach the institutions for consideration from the admission pool (Study in PNG, 2019).

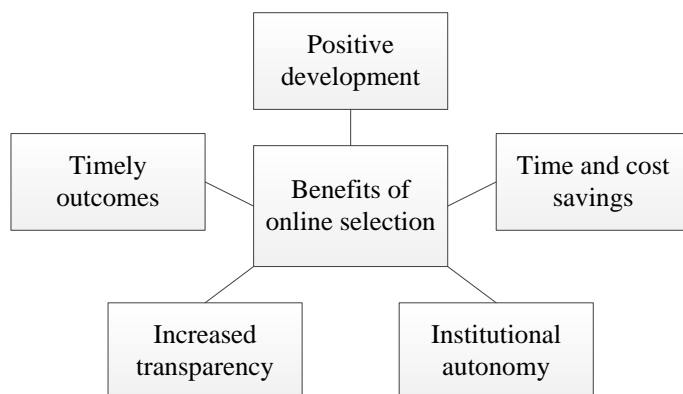
Moreover, the SLs are given a grace period of about 72 hours to make any changes to their choices through the NOAS before the automatic national online selection is conducted (Post Courier, 2018; Study in PNG, 2019). The SLs can access the NOAS using their usernames and passwords provided by DHERST. Usually, at this time, the SLs would have known their grades. Within this grace period, the SLs and their parents have adequate time to make any necessary well-informed choices. After the grace period, the automatic selection is performed and the SLs can see immediately whether they have been selected or not.

Further, backup choices were implemented in the NOAS to allow SLs to be selected into different study programs if they were not selected in their top five choices (Post Courier, 2018; Study in PNG, 2019). These backup choices could be similar to their

preferred study programs or those for which they have met the requirements.

### **NOSS benefits**

The NOSS has several benefits (Figure 6), which are discussed below.



**Figure 6:** Benefits of the online selection process (NOSS)

#### ***Positive development***

NOSS is seen as a timely initiative that is “practical and sustainable...to cater for growing school population in the country” (PNG Insight, 2019, para 47). It is a positive development, enabling a fair, efficient and cost-effective process (Owa, 2019; Sefe, 2019). The HEIs experienced significant differences between the manual process and the online process, which had a positive impact on academic operations and capable students being selected by the NOSS (Sefe, 2019).

#### ***Time and cost savings***

NOSS enables significant cost and time savings unlike the manual process, which required costs of travel, accommodation and allowances for the institutional selectors and hiring of a venue for the selection (Owa, 2019; Post Courier, 2017a, 2017b; Sefe, 2019). With the NOSS, the selectors do “not have to spend time away from their normal duties” (Owa, 2019, para. 6).

***Increasing transparency***

NOSS uses a proven algorithm in the selection process, ensuring transparency and lucidity, preventing unfairness, favouritism and corruption perceived to have occurred in the manual process (Kora, 2017; Owa, 2019; Post Courier, 2017a, 2017b; Sefe, 2019). The online selection process is fair and unbiased (PCG Academia, 2017). Each child has the right to education and the NOSS gives the SLs equal consideration as long as the requirements are met (Post Courier, 2018).

NOSS was developed to improve transparency, accountability and efficiency in the selection process. The manual process was perceived to have had high instances of dubious selections, which resulted in SLs being selected through nepotism (e.g. wantok system) (The National, 2018). NOSS ensures transparency, prevents nepotism and unfair practices that would have been possible in the manual process (PCG Academia, 2017). The former Minister for DHERST, Mr Niningi, assured that “there will no longer be bribery, nepotism and corrupt practices. It will be a just, fair and quality education system that gives every individual child the right to education” (Post Courier, 2018, para. 11).

***Timely outcomes***

The universities receive their selection lists on time, giving them adequate time to prepare offer letters to be sent to the selected SLs on time unlike in the past where institutions waited long periods to receive their selection lists (Sefe, 2019). Further, the SLs will know immediately whether they have been accepted into an institution or not (PCG Academia, 2017). In the past, the SLs and their parents would wait, without knowing whether they (SLs) have been selected or not. If selected, they would wait for long periods to receive their offer letters, giving limited time to raise school fees or seek sponsorship. Parents and students can view their outcomes immediately after the online selection using

the NOAS, giving them adequate time to prepare for higher education (Post Courier, 2018).

### ***Institutional autonomy***

The HEIs still maintain their autonomy in the selection process by setting their requirements. DHERST only facilitates the selection process and supports the HEIs to select suitable candidates without any undue influence (Sefe, 2019). The NOSS increases the chances of capable SLs being selected while still maintaining the autonomy of the institutions (The National, 2018).

The next section provides some suggestions for the optimum use of the NOSS.

### **Suggestions for optimum use**

Regular open dialogue and proper communication between DHERST and all the HEIs need to be maintained (The National, 2018). Such communication is required to ensure that the HEI requirements are correct, accurate and up-to-date in the NOSS. These requirements also need to be communicated well and clearly to the schools, principals, guidance officers, SLs and their parents.

The SLs need to make well-informed decisions when making their choices using the NOAS. They must access their results on time to update their choices or make any necessary changes to increase their chances of being selected to a program of study at their preferred institution. The SLs need to make use of the strategies discussed earlier (e.g. backup choices and grace period).

The schools need to provide relevant information about the HEI program offerings and requirements to the SLs. They need to provide proper guidance to their students in the application process when using the NOAS. The SLs may also need to discuss

with their parents, who might be able to provide some advice when making their choices.

Further, DHERST needs continuous support from the schools, SLs, principals and guidance officers, teachers and parents, HEIs, NDoE and other relevant stakeholders. They all need to continue working together to ensure that the NOSS is used properly to ensure a quality selection that is fair and transparent and gives equal chances of selection of suitable SLs.

Ongoing awareness about how the NOSS works, its features (e.g. backup choices, and admission pool) and benefits also need to be provided through various forms of media (e.g. social media, EM TV, TV WAN and NBC). Required training may also need to be provided to HEIs, especially for selectors, who may not know how to use the system. Such awareness and training will avoid misunderstandings and misconceptions about the NOSS.

### **Conclusion**

Technological advancement has enabled many countries to improve their educational processes and deliver services with increased effectiveness and efficiency. The PNG Government through DHERST, in partnership with PCG Academia, developed the NOSS to improve the process of selecting SLs for further studies at HEIs.

This paper discussed the role of higher education and DHERST, manual selection process and its disadvantages, online selection and its benefits, and some suggestions for further improvement and optimum use of the NOSS.

Higher education is an important sector for national socio-economic development. THE PNG Government, through DHERST, aims to provide quality educational services and contribute to achieving the stated Government aspirations.

The previous manual process of selecting SLs had several issues. It was time-consuming, slow, costly and resource-intensive. The manual process was perceived to have a lack of transparency and involved nepotism, leading to high chances of questionable selection of SLs. These issues led to the development of the NOSS to implement the online selection process.

The NOSS was implemented to improve the selection process and achieve increased efficiency and effectiveness. It aimed to reduce cost, time and resource-intensity, eliminate nepotism and increase transparency, leading to a fair selection where all suitable SLs have an equal chance of being selected.

The NOSS is a timely and positive development and expected to contribute towards PNG's socio-economic development. It is, therefore, important to consider the provided suggestions for further improvement and optimum use of the NOSS.

## **References**

- DHERST. (2015). *About* Retrieved 22 August 2020, from <https://web.dherst.gov.pg/index.php/about>
- DHERST. (2018a). *Higher and technical education strategic implementation plan* Retrieved 22 August 2020, from <https://web.dherst.gov.pg/about/he-stategic-implementation>
- DHERST. (2018b). *Improvements to the national online selection system including the rollout of national online (common) application system* Retrieved 9 August 2020, from <https://web.dherst.gov.pg/about/secretary-office/circulars/42-about/secretary-s-office/circulars/100-circulars-testing1>
- DHERST. (2018c). *National online selection system* Retrieved 10 October 2019, from <https://web.dherst.gov.pg/students/admissions/get-selected>

- DHERST. (2018d). *Welcome to DHERST* Retrieved 22 August 2020, from <https://web.dherst.gov.pg/>
- Kora, A. (2017). *New online selection process commended* Retrieved 9 August 2020, from <http://www.looppng.com/tech/new-online-selection-process-commended-68180>
- Loop PNG. (2018). *Insight into new online selection system* Retrieved 1 August 2020, from <http://www.loopng.com/community/insight-new-online-selection-system-78499>
- Nazel, R. (2018). *A corrupt online selection system by Department of Higher Education skips Brendon Bero - Grade 12 student from Wabag Secondary School* Retrieved 6 July 2020, from <https://news.pngfacts.com/2018/01/a-corrupt-online-selection-system-by.html>
- Owa, J. B. (2019). *National online selection system a positive development* Retrieved 9 August 2020, from <https://emtv.com.pg/national-online-selection-system-a-positive-development/>
- Papua New Guinea Today. (2017). *National online tertiary selection system in Papua New Guinea* Retrieved 9 August 2020, from <https://news.pngfacts.com/2017/12/national-online-tertiary-selection.html>
- PCG Academia. (2017). *Launch of national online selection system in Papua New Guinea* Retrieved 1 August 2020, from <https://pcgacademia.pl/news/launch-of-national-online-selection-system-in-papua-new-guinea/>
- PNG Insight. (2019). *Grade 12 online results and selections timely interventions* Retrieved 9 August 2020, from <https://pnginsight.com/grade-12-online-results-and-selections-timely-interventions/>
- Post Courier. (2017a). *New online selection process for grade 12 underway, Post Courier.* Retrieved 9 August 2020, from

<https://postcourier.com.pg/new-online-selection-process-grade-12-underway/>

- Post Courier. (2017b). Online selection system, *Post Courier*. Retrieved 20 August 2020, from <https://postcourier.com.pg/online-selection-system/>
- Post Courier. (2018). Online selection rolls, *Post courier*. Retrieved 20 August 2020, from (<https://postcourier.com.pg/online-selection-rolls-mp/>)
- Sefe, J. (2019). Unitech embraces national online selection process, *Post courier*. Retrieved 9 August 2020, from (<https://postcourier.com.pg/unitech-embraces-national-online-selection-process/>)
- Study in PNG. (2019). *Secretary for Department of Higher Education, Research, Science and Technology (DHERST) clarifies student online selection* Retrieved 1 August 2020, from <http://studyinpng.com/2019/01/department-of-higher-education-research-science-and-technology-dherst-clarifies-online-selection/>
- The National. (2018). Improve online selection system, *The National*. Retrieved 28 August 2020, from <https://www.thenational.com.pg/improve-online-selection-system/>

### **Future paper**

There was limited literature about the national online selection system at the time of writing this paper. Hence, a future paper could discuss other aspects of the system, which are not discussed in the paper, as more literature becomes available.

### **Acknowledgement**

I would like to thank Professor Peter K. Anderson for reviewing this paper. However, responsibility for any errors of fact or opinion remains with the author.



**Author**

Martin Daniel (PhD) is an Associate Professor and the Dean of the Faculty of Business & Informatics at DWU. He holds a Bachelor's degree in Information Technology from the University of Queensland in Australia, a Master's degree in Information Technology from the Queensland University of Technology in Australia and a Doctor of Philosophy from DWU. His interests include researching and modelling technological developments (e.g. e-government and e-learning) in PNG. Email: mdaniel@dwu.ac.pg and mdmartindaniel@gmail.com.