International Journal of Multidisciplinary Research and Publications
ISSN (Online): 2581-6187

Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea

Patrick. S. Michael
Department of Agriculture, Papua New Guinea University of Technology, PMB, LAE, MP 411, Papua New Guinea
[δ] Correspondence: patrick.michael @ pnguot.ac.pg, Telephone +675 473 4460 & Fax +675 475 4466
https://orcid.org/0000-0003-4068-7276

Abstract— *Online education using information technology is an extension of classical education that brings higher education (university education) to the communities. The use of information technology and its efficacy for distance education in this region (Pacific Islands) is not widely reported. In this study, a purposely designed questionnaire with four open-ended questions was hand-delivered to two focus groups of 180 students each (360 students) at the PNG University of Technology over three years (2017–2019) to determine the popularity of online and curiosity of on-campus learning among distance education students at the PNG University of Technology. The four open-ended questions were designed to show the popularity and curiosity of two modes of delivery, online and blended, and their efficacies. Nearly 60% of the young students showed online education is popular compared to 38% of the mature students with most of them (55%) demonstrating online education is a suitable mode of delivery in distance education. Demographic separation of the data indicated 15–30% of the female students thought a blended mode is suitable, compared to 60–80% who recommended against it. A similar number of male students (70–75%) pointed out that the blended mode cannot be recommended to future distance education students because many higher education institutions are incapable of running concurrently their regular programs. In all, 60–75% of the respondents indicated providing online education is bringing university education to the communities, therefore, an important community service.*

Keywords— *Blended delivery mode, distance education, higher education, online education, PNG.*

I. INTRODUCTION

In light of revolution in information and communication technologies (ICT), distance education has evolved as a solution to a diverse range of inequalities. The general anticipation is that adopting an online form of educational delivery enhances the accessibility of university education (Lee, 2020), with ICT supporting learning processes that are not available in various ways education (Online Learning Task Force, 2011), e.g. access to learning, better allocation of teaching resources and deeper learning (Rosenberg, 2001; Johnson, 2003; Martin, 2009; Lee 2017). Distance education to online education dates back to the mid-1800s (Verduin & Clark, 1991), where open universities thought providing educational opportunities to those unable to attend face-to-face programs offered by traditional campus-based universities a sense of community service (Wedemeyer, 1981). In the University of London, such as external degree programs were offered to correspondence students in 1858, targeting women and minorities (Haughey, 2010). In the US, the first correspondence program started in 1873 when Anna Ticknor, a woman educator, wanted to enroll women across social classes and geographical boundaries (Agassiz, 1971; Bergmann, 2001). Towards the end of the 1800s, a vast group of distance students was provided correspondence teaching by universities in the UK and the US as part of university extension. The targets were underserved populations including women and blue-collar workers (Trachey & Richey, 2005). Throughout the 1900s, more open universities were established across the globe with the aim of providing accessible higher education (HE) (Peters, 2008) using affordable ICT (Guri-Rosenblit, 2009a).

In the late 1980s and onward, a number of universities in PNG established distance education programs – Department of Open and Distance Learning (DODL) at PNG University of Technology, College of Distance Education (CODE) at University of Papua New Guinea, Distance and Open Learning (DOL) at University of Goroka, Flexible Learning Centre at Divine Word University and Department of Self Education (DOSE) at PNG University of Natural Resources and Environment. Whilst many programs target post-secondary students, programs in post-college or undergraduate studies are taking momentum, for example, Department of Agriculture at The PNG University of Technology offers a Bachelor of Agriculture and Rural Development (BARD). PNG universities use a "blended delivery mode" (BDM) involving face-to-face classes as well as a study away component to the "distance education students (DES). The BDM, however, has become a concern for the elite universities in PNG and the DES from the communities. Figure 1 shows some of these concerns of the BDM from the distance education providers and the DES points of view, e.g. security concerns of female DES.

The common perception is that HE provides knowledge and skills that equip graduates to get a paid job and help transform societies by understanding problems faced by the societies. In the recent past, the unemployment of graduates of HE has risen and is continuing because of various reasons. Employers have begun to think that content and the teaching approaches of HE institutions are too theoretical, making HE graduates unmarketable or inexperienced, needing further

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

training for work suitability at the employers' expenses. Many HE settings and their facilities are not proportionate to full-time students or DES. The classroom and laboratory facilities are small and the equipment found in them for skills training are out of date or not available, and if available, not enough or not in working conditions. The small classroom spaces and limited facilities are complicated by a lack of sufficient and adequately trained faculties to teach many students. Library facilities are not modern, limited in stock and out-dated, and even computers are a few with no internet connections. Lack of state-of-the-art facilities, maintenance of deteriorating, and the development of new facilities are wholly due to continuous cuts in funding from the government. Because of the general economic situation and availability of limited funds, HE in PNG is unable to meet developmental needs. Increasing tuition addresses part of the financial issues but makes the society to see such HE institutions as expensive and not community-oriented. Hike in tuition fee has even resulted in riots, strikes, and boycotts in PNG HE, and such action by HE administration became political, and have to be changed under political influence and intervention.

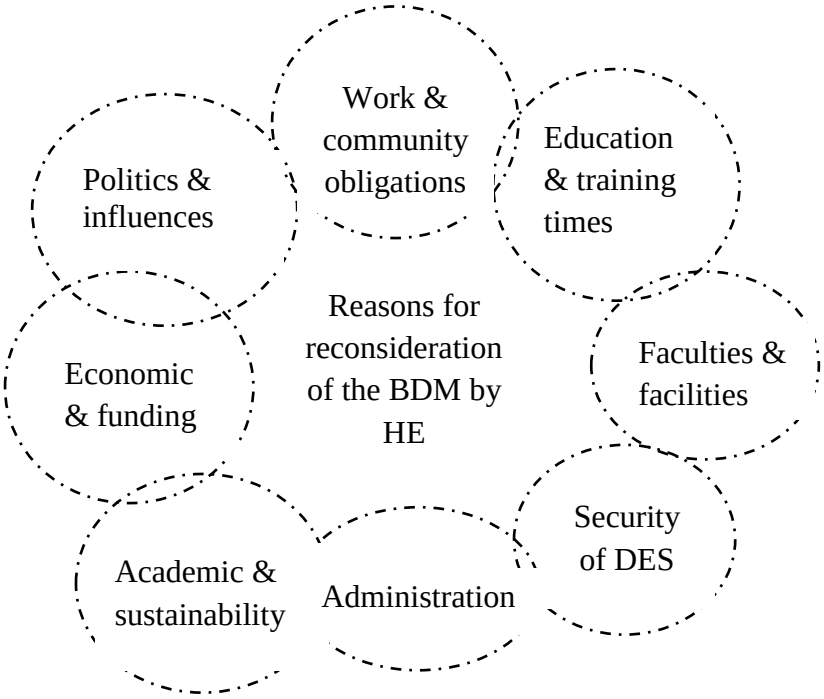

Figure 1. Barriers to blended delivery mode of distance education.

The general members of the society, e.g. the working adults and private citizens are preoccupied with obligations (e.g. work and parenthood) and are often busy attending face-to-face classes through the BDM. Most members of the communities are dropouts of primary education, upper primary, secondary or college graduates, making some of them incapable of attending classes conducted by university faculties who are used to lectures in university settings. Communities want to stay close to their families and within their cycle of influence in the community settings. Most classes in distance education are conducted after hours (past 4 pm) because of the unavailability of lecturers or contracted secondary and college teachers doing their full-time jobs during working hours. In addition, classrooms and support facilities like the library and computer laboratories are occupied during the working hours and not opened to the DES, and often many times, teachers are unavailable for consultation because of engagement with secondary or university full-time students. In addressing these needs, making information relevant to community livelihood, e.g. appropriate technologies for mitigating climate change, available for common use is bringing education (knowledge) to the needy, at the same time an act of community service. Not only is that providing education is a community obligation, a conduit for the HE-community relationship to foster research, extension, and development. The traditional HE settings meant for face-to-face teaching or distance education is unable to achieve most of these importance of the communities.

This study was conducted to determine the popularity of online and curiosity of on-campus learning among two focus groups (upper secondary and diploma graduate) DES of The PNG University of Technology with two goals. The first was to establish the most popular mode of delivery of distance education among DES and the second was to show whether providing distance education online by HE institutions is a community service.

II. Methodology

Study Design

Phenomenology, a quantitative research design (phenomenon research design, PRD), was used to determine the understanding of DES about the distance education

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

provided to them by the PNG University of Technology, Papua New Guinea. The PRD was intended to show the perceptions and experiences by allowing individuals to reflect on the phenomenon and answer four basic questions asked through an open-ended questionnaire. The opinions of the DES studying by distance education were treated as the phenomena of the DES of distance education provided by the PNG University of Technology.

Target Groups

The study was conducted using two focus DES groups. The first group was upper secondary school dropouts upgrading their grades at the Department of Open and Distance Learning (DODL). This group is mainly made up of upper secondary students (20–30 years) and have a limited understanding of online education. These students are enrolled to upgrade low grades to meet HE admission requirements. The second group was made up of mature (30–≥35 years) and experienced students doing Bachelor of Science in Agriculture and Rural Development (BARD), a degree program offered by the Department of Agriculture. The BARD students hold a Diploma in Agriculture from various colleges or universities in PNG. BARD students are enrolled to advance their knowledge and skills needed in the industry to stay competitive at work, especially with the crop of fresh graduates coming from the HE institutions. All the participants who took part were registered, full-time DES in the two departments from between 2017–2019. The strategic areas, under which the questions were derived from, in line with the aims, were fourfold:

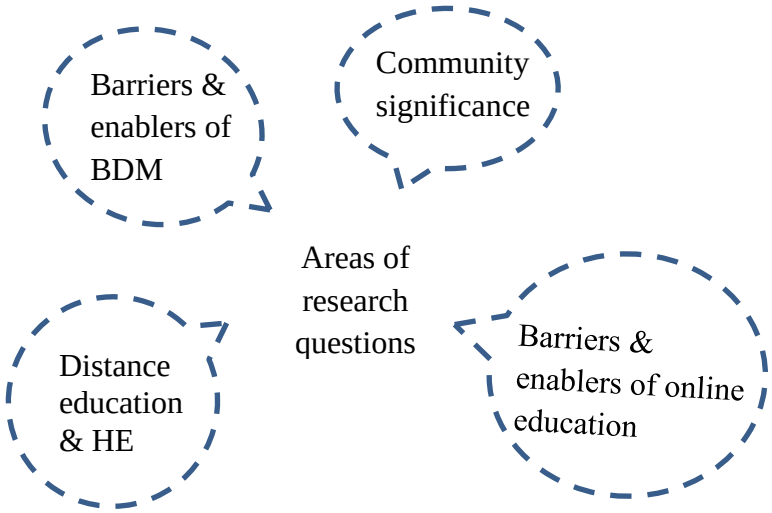

Figure 2. The strategic areas in (i) barriers and enablers of BDM and online education of distance education and (ii) the importance of the two to the community (DES).

Corresponding to the strategic areas, most studies in the literature (e.g. Rogers, 2000; Pajo and Wallace, 2001; Al-Senaidi *et al*., 2009) concentrated on identifying barriers of online education, such as those shown in Fig. 1. Recently, a number of studies pointed out studying the barriers as well as the enablers are important (e.g. Jasinski, 2006; Samarawickrema & Stacy, 2007). This paper is based on a single case study using the two focus groups using data collected from them and analysis of publications on HE in developing countries. The data collected were systematically arranged and clearly put into perspectives, with discussions supported by information from the synthesis of the literature. Closer attention was paid to enablers and challenges of HE in developing countries using the PNG context and what needs to be done to improve it. One important aspect of the study is that it only concentrated on the aspects of students, "young and inexperienced" and "mature and experienced", as the main stakeholder of HE, e.g. the universities. The author's experiences as an academic for nearly 13 years makes the synthesis of students' responses and the analysis of the literature a wholesome presentation for the wider readership.

The study was done based on four key questions designed around strategic areas shown in Fig. 2 that are typical of universities in developing countries. All the students were asked to give at least five bullet points to support their choice of answers to the questions. The four questions from which data were collected were:

1. Is BDM or Online Education ideal for DES?
2. Do you think the BDM needs to be replaced with Online Education?
3. Based on your answers to questions 1 and 2, would you recommend BDM to future DES?
4. Is providing distance education by HE a community service?

All the participants were studying using a "BDM" when the study was conducted and only attending to face-to-face classes on scheduled days. The DODL students were staying at home all the time whilst the BARD students resided on campus to attend the face-to-face classes. A total of 360 students, 180 DODL and 180 BARD participated in the study (Table 1), with 50% of them in the first year and the other 50% in the last year, respectively. Sixty students (50% male and 50% female) each responded to the same questions each

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

year. The students were asked to voluntarily and anonymously complete the open-ended questionnaire containing the four questions and return within a period of seven days by dropping it off in an assignment box to maintain the anonymity of the data sources. The same questions were asked over the period of three years, making *n = 3* number of responses to a question. The total number (n) of responses obtained were pooled, average ($\bar{x}$) taken as shown by Eqn. 1 and recorded (Table 1). Based on the total number of participants and N, the final responses (%) were calculated. More than 98% of the questionnaire was completely filled and returned on time, and only 2% was not filled properly, or returned late were not considered, making the total responses to be less than 100%, e.g. 98.6% to Question 1 (Table 1).

Table 1. Summary of responses of the focus groups over the three years.

	2017		2018		2019		Total	Average	Response
	DODL	BARD	DODL	BARD	DODL	BARD	(n)	($\bar{x}$)	(%)
1	60	60	56	60	59	60	355	59.17	98.61
2	60	58	60	60	58	56	352	58.67	98.78
3	60	60	55	60	60	60	355	59.17	98.61
4	58	57	59	60	60	58	352	58.67	98.78

The age range of the students were from between 20–30 and 30 – ≥35 years, respectively.

Data Collection and Analysis

A semi-structured questionnaire, issued to individuals of the two focus groups was used to collect the data. Issuing the questionnaire to the DES was ideal since face-to-face interview was not possible with all the participants being day students. This approached further provided flexibility and amble time for the students to provide the responses from their own settings and timing. All the participants were made known the aim of study and participation was voluntary. The answers provided by the DES participants were analysed by describing them. The descriptive analysis method was used to interpret the data as per the predetermined theme. Similarly, descriptive statistical analysis of the data were done using Statistix 10 Statistical Software, Tallahassee FL, USA. Basic descriptive statistics (sample mean, standard deviation and standard error) were calculated, respectively, using the software as:

1. Sample mean

$$\bar{x} = ((\Sigma x_i) \div n) \quad (1)$$

where $\bar{x}$ = mean of responses, Σx_i is sum of the responses and n = total number of individual responses. For instance, $\bar{x}$ shown in Table 2.

2. Pooled sample standard deviation

$$\delta = \sqrt{[(n_1 - 1)s_1^2) + (n_2 - 1)s_2^2) + (n_3 - 1)s_3^2) \div (n_1 + n_2 + n_3 - 3)]} \quad (2)$$

'δ' is the pooled sample standard deviation, 'n_1', 'n_2' and 'n_3'are the sizes of the 2017, 2018 and 2019 samples that were being pooled. The 's_1^2', 's_2^2' and 's_3^3' terms are variances of the 2017, 2018 and 2019 samples, respectively.

3. Standard error (SE)

$$SE = \frac{\delta}{\sqrt{n}} \quad (3)$$

'SE' is standard error of sample, 'δ' is sample standard deviation from (2), and 'n' is number of samples.

III. Results And Discussion

The data collected were interpreted by "explanations" related to and within the framework of the research questions, and these explanations are presented in this section. Where the data are not presented as explanations, the responses are expressed as percentage or in basic descriptive statistics (mean, standard deviation and standard error) to explain the data more clearly. The data collected, where relevant, have been organised into data tables and figures.

Suitability of delivery modes for PNG DES – BDM vs Online Education (Question 1)

In PNG, the majority of the people have access to the latest gadgets, especially school-age children and younger adults, and there is almost a laptop within all family units who has a member of the family as a student. In the late 1990s, mobile phones were owned by a few, and computers were limited to offices and assigned computer laboratories in private or government schools. Internet facilities were only available in workplaces, making information use through this facility hard and people have to make time available to visit libraries, often with difficulty because of limited availability, near rural settings. Nowadays, access to speedy internet through widely used "external modems and WiFi networks" is making access to information databases available at the fingertips for those who need them, making textbooks, journals, and other print material from a library "needs of the past" (Bogdanvic, 2012). These are the probable reasons why 58% of the DES thought distance education is suitable for them (Table 2). Most of the respondents mentioned distance education is useful for a number of reasons for the community and not only DES, with more than 80–90% of them having access to a computer or mobile phone capable of retrieving online material (Table 1). Taking the revolution in "digital technology" into consideration and the basic knowhow of technology use now common in every household, with even adults willing to learn to use it, educators need to see how technology can be used effectively to deliver university education away from a classical classroom setting.

The option to take university education to rural communities through distance education comes from two important factors; the university setting, and the student. The benefits (some) of providing distance education by providers are given in Fig. 3. In terms of distance education and meeting admission, nearly 83–89% of the students (83% DODL and 89% BARD) have shown that admission requirements can be met through distance education and admission are affordable (Table 2). A good number of the younger DES had mixed feeling on security and inconvenience (92–95%), indicating interacting and face-to-face contact with teachers

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

are needed to understand complex study materials, compared to 28% of the mature DES (Table 2). The mature students thought technology is dependable to contact and interact with distance education providers and fellow students. A high proportion of them (80–99%) showed that access to technology, using it for studies and academic-related activities is crucial (Table 2). The general consensus among the younger students was that their age group needs to attend university education using a classical blended mode to learn due to poor facilities (56%), whilst more of the older group thought so long as the materials to be taught in a classroom setting are available to them online, use of technology to deliver and access them is important, for online education providers and the DES.

Table 2. Suitability of distance education to distance education students.

	Responses (n)						Total responses (%)		
	DODL			BARD			DODL + BARD		
Question 1	Yes	No	NS	Yes	No	NS	Yes	No	NS
	140	35	5	70	100	10	58.33	37.50	4.17
Reasons									
○ Admission	150	20	10	160	15	5.0	86.11	9.72	4.17
○ Affordability	50	120	10	165	15	5.0	59.72	37.5	1.56
○ Insecurity	166	10	4.0	50	115	15	60.00	34.72	5.78
○ Inconvenience	163	15	2.0	160	5.0	15	89.72	5.56	4.72
○ Poor facility	100	60	20	170	5.0	5.0	63.89	29.17	6.94

The values are the average of 2017, 2018 and 2019 sample responses.

The varying responses of the younger generations of students versus the older ones indicated maturity and experience play an important role in the choice of where and how to receive education, with almost all the younger respondents thought "need to attend a university setting" and the mature students having the opposite opinion. It is interesting to deduce too that young students tend to think the quality of training equates to a classroom-based setting and mode of delivery, therefore the quality of knowledge obtained from online education is questionable. The mature students, because of certain levels of training at diploma level and exposure, were confident that distance education would qualify them as much as a classroom-based teaching would do, therefore, making attending university "not always" a compulsory option for those who need training. This group of students' collective opinion on training related to formal education was the same – nearly all the mature students showing it is necessary to attend a certain level of classroom-based training (discussed separately below), e.g. supervised practical or projects, where a certificate of qualification has to be issued to the student.

This study further showed that training of students for purposes other than obtaining a formal qualification, e.g. improved standard of living, distance education provided through use of technology, primarily internet or CD-ROM, is enough, so long as the information provided is high quality and relevant to a standard, e.g. PNG National Qualification Framework (NQF 7). A number of mature students pointed out insecurity (35%, Table 2) is a major concern, pointing out that most of them are semi-educated, therefore distance education mode like online education is a problem, culminating from complex materials containing information provided that are not relatively simple, easy to understand and apply, compared to the same provided for qualification training at university settings. The major reason being university settings are purposely designed for study compared to studying online where DES have to study from a village setting, e.g. from a family home with members around, nearly all of them doing activities which are potential sources of disturbance and inconvenience. This was supported by 90% (Table 2) of DES who pointed out that inconvenience is a major issue of distance education where DES have to study from a different setting not meant for study, e.g. a shared family room. The overall result (58%) showed the provision of distance education is important, particularly when nearly 20, 000 grade twelve students are unable to enter PNG HE each year, an important community service.

Suitability of delivery modes – PNG Higher Education (Question 2)

The second question was asked to prove the suitability of the delivery mode – either BDM or online education as the most suitable for PNG HE in general and for PNG University of Technology, in particular. Interestingly, the responses were quite variable. More than 55% of the DES has shown BDM needs to be replaced with online education and 21% indicated a certain level of face-to-face interaction is necessary (Table 3). Among all the students, most thought inconvenience followed by poor facilities and insecurities are issues that needed BDM to be replaced (Table 3). Further, the younger students showed family and work commitments are not the reasons for the change in delivery mode, and most of the adult students thought family and work commitments are the main reasons. These seem to come from some of the main reasons pointed out earlier. For instance, younger students showed online education admission is flexible but with many inconveniences (Table 2), corresponding to the high number of students saying BDM needs replacement. The younger students were worried technology (e.g. internet) can fail and their online education can become difficult at times, causing a lot of inconveniences in accessing training materials, interacting with students, or contacting their advisors (e.g. tutors). Nearly 50% have shown online education requires extra effort having families (Table 1), e.g. having kids around in the home, compared to a university dormitory with study rooms meant for study only. Among the older students, 80–99% of them agreed online education admission is flexible and fees are affordable because security against study and inconveniences related to online education are minor issues

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

(Table 1) and can be managed. Greater than 70% of the mature students have shown having families around is not an issue, pertaining from nearly all DES are adults and have families of their own that need them, e.g. kids would always love their dads or mothers to be around them. Another interesting finding was that more than 80% of students felt university admission is very competitive and online education is an alternative avenue to those who cannot make to it (like the year twelve dropouts), or those who did not make it at the first place (e.g. the working adults) to advance themselves and stay competitive.

Table 3. The suitability of delivery mode for PNG HE to DES.

	Responses (n)						Total responses (%)		
	DODL			BARD			DODL + BARD		
Question 2	Yes	No	NS	Yes	No	NS	Yes	No	NS
	100	70	10	170	5.0	5.0	75	20.83	4.17
Reasons									
○ Family	70	90	20	160	10	10	63.89	27.78	8.33
○ Work	50	130	0	170	8.0	2.0	61.11	38.33	0.56
○ Insecurity	90	70	20	100	70	10	52.78	38.89	8.33
○ Inconvenience	150	20	10	160	18	2.0	86.11	10.56	3.33
○ Poor facilities	150	10	20	170	5.0	5.0	88.89	4.17	6.94

In HE institutions, e.g. universities and colleges, there is a chronic shortage of well-educated, highly qualified, and technically skilled teachers (Pintrich, 2002; World Bank, 2000). This problem seems to be common among many HE institutions in the developing world (e.g. Suresh & Kumaravelu, 2017; Bunoti, 2011; Bourdon, 2017; Garcia & Weiss, 2019; Anderson & Gronlund, 2017). Not only that, but the HE sector also is not well funded by the government to keep the few who are willing to bring higher learning education, research, and extension to the next level and or high standards (Basheka *et al*., 2009). Apart from the old rundown facilities, there is no investment and development in new infrastructure, let alone the supply of modern equipment. These issues and the current revolution in information technology, universities need to deliver the courses offered using alternative approaches, e.g. through external mode and online education (Rosenberg, 2001). Those who are already engaged are tight up with too much teaching and are unable to provide BDM to everyone.

When the courses offered at PNG HE are delivered through online education, the need to worry about (i) issue of faculty shortage, (ii) student dormitories, classroom spaces, and even issues related to student attitude and behaviour, (iii) the issue of vandalism in student dormitories and costs associated with maintenance, and (iv) attitude and behaviour as students, all would be addressed. A few numbers of faculties can manage and provide study materials online, and the issues related to space and student behaviour managed by family units and community obligations (Baran & AlZoubi, 2020). Some of these are major issues affecting HE institutions around the globe and online education is an ideal option to overcome most (or all) of them. In addition to the advantages discussed below in relation to the data presented in Table 1, offloading a number of courses of immediate community applicability and DES can easily study online would not only address some of the issues shown in Fig. 3, for instance, shortage of qualified teachers but provide optional pedagogy and LMS, helpful to the education providers. Reduced enrolment with manageable student population by allowing more to study as DES means saving on utility and operational costs (Vialle *et al*., 2005).

The saving, in material, money, time, and labor can be diverted to developing facilities (e.g. effective and speedy ICTS for students to access online course materials), review and introduce new courses and programs, and increase the number of postgraduate and research output. In PNG, faculties employed in a university are hardly conducting research and publishing. The basic reason for this being too many hours of teaching of too many subjects and no time for conducting research, compounded by the deteriorating research and lab facilities due to lack of funding support. Offloading the workload through online education would free up time for more research and publication (Bates, 2004). The extra free time available can be converted into writing modules, online practical and laboratory manuals, and even assignments that are user-friendly and encouraging to read. DES can also spend more time attending to online queries. Teaching and research standards in many state-funded HE institutions have dropped because of financial cut and deteriorating facilities. A drop in the standard of education provided has become a major issue for the industries where students need to apply for employment upon graduation. The courses taught in university settings are designed to meet the requirement of the industry, but there is a disparity in what is really expected of the graduates by the industry. The drop in standard has created a gap between the industry as an employer and the HE as the provider of graduates with good attributes. Some industries are already suspicious of the type of training provided, creating problems of nepotism in graduates of certain HE over others. The kind of disparity in graduate attributes in HE with the graduates of church-run universities being highly accepted than the public universities calls for public-funded HE institutions to provide the graduate attributes needed, that are standard and widely acceptable. One way of doing this is to embed in the curricula what is needed by the industries, quality assurance through accreditation, and purposive module design (Horton, 2000). When these are easily considered in theory, there is hardly room in the syllabi of courses taught in various disciplines. This makes online education an important option forward to promote and deliver what is needed, as shown by the results of this study. A limited number of core subjects (e.g. 4 subjects a semester) can be delivered from a

classroom-based setting whilst others can easily be made electives to be delivered by distance mode (Melton, 2002).

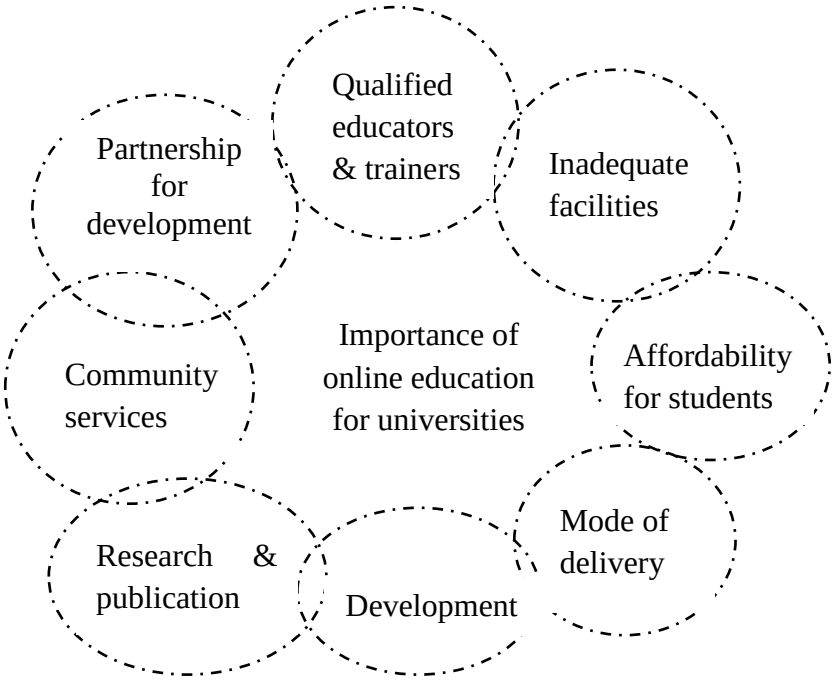

Figure 3. Issues of online education for PNG HE institutions.

In addition, industry requirements can be met by universities through development of courses with its input for employed students enrolled to study online while still at work. These "working students" of various industries studying online becomes a perfect conduit and the extension arm of the university in developing and delivering what is really needed, embedding the needs of industry in the curricula, and developing stronger university-industry relationships. When working students are enrolled this way, industries can then make their inputs on the content of the modules to be studied, a great initiative for the industries to have direct say on modules taught by the universities. There is need for industries to identify common lab equipment in state-funded universities that are standard and widely used in the industries to help students equip themselves with the skills demanded by them. This is an important approach to make students skills-ready for industry engagement. In most universities, the hands-on training and practical conducted are limited to what is affordable, and the involvement of industry would ease the acquisition of modern and standard equipment for student use and practice, which have relevance to the industry.

Limitations of PNG Higher Education (Question 3)

Question 3 is interconnected to the first two questions and was asked to prove the basis of the responses to Question 2. That is, why would the participants recommend BDM to future DES? Based on the results, the idea was to assess whether respondents thought online education was equally important. The data collected were separated demographically to show the responses of the feminine clearly from the masculine, as presented in Figs. 4 and 5. This separation was necessary as most female students would tend to be security conscious and would recommend against BDM to future DES. Only 15–30% of the female DES recommended BDM compared to 80–60% who recommended against it (Fig. 4). This is a very strong indication most female tend to think online education is important to DES, especially among the younger group who thought this is so by 80%. Among the male, less than 25% indicated BDM is ideal, compared to 75–70% who responded BDM would not be recommended; most of them (70%) were DODL respondents (Fig. 4). Less than 5–10% of the DES were not sure. These results showed that more DES was of the opinion that distance education needs to be provided online by HE. Collation of the opinions of the DES seemed to be the same among the students.

The perception of the older DES (BARD) was similar, with 60% of the female and 70% of the male indicating the BDM is not really necessary compared to the less than 30% who thought the blended mode is important (Fig, 5). One of the major concerns of the students who said the BDM is important was unreliable internet facilities, but indicated accessibility to online materials is easy from mobile networks, supporting the opinion of most students that BDM is not the only option (Figs. 4 and 5). This concern is consistent with Bunoti (2011) who pointed out that the internet and its accessibility in proportion to the number of students admitted are the most limiting factor to online education. In almost all government funded universities, internet facilities are provided and accessibility is good, making online education realistic and attainable (e.g. Ramayah, 2010; Shin *et al*., 2015). The DES, however, raised a concern that the internet provided by private companies, is reliable but accessing online materials is expensive. Sun *et al*. (2008) supported this and emphasized that even if the internet is reliable, accessing

Patrick. S. Michael, "Popularity of Online and Curiosity of On-Campus Learning Among Distance Education Students of PNG University of Technology, Papua New Guinea," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 3, Issue 11, pp. 46-57, 2021.

online materials from the website are still a common problem in the developing world HE institutions.

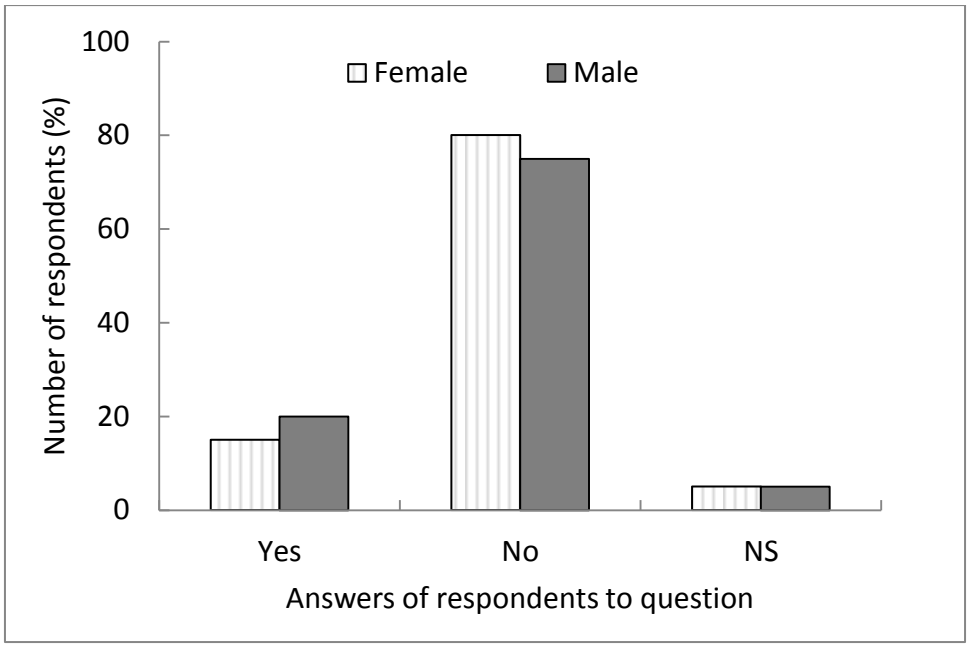

Figure 4. Perceptions of DODL DES on importance of the blended delivery mode.

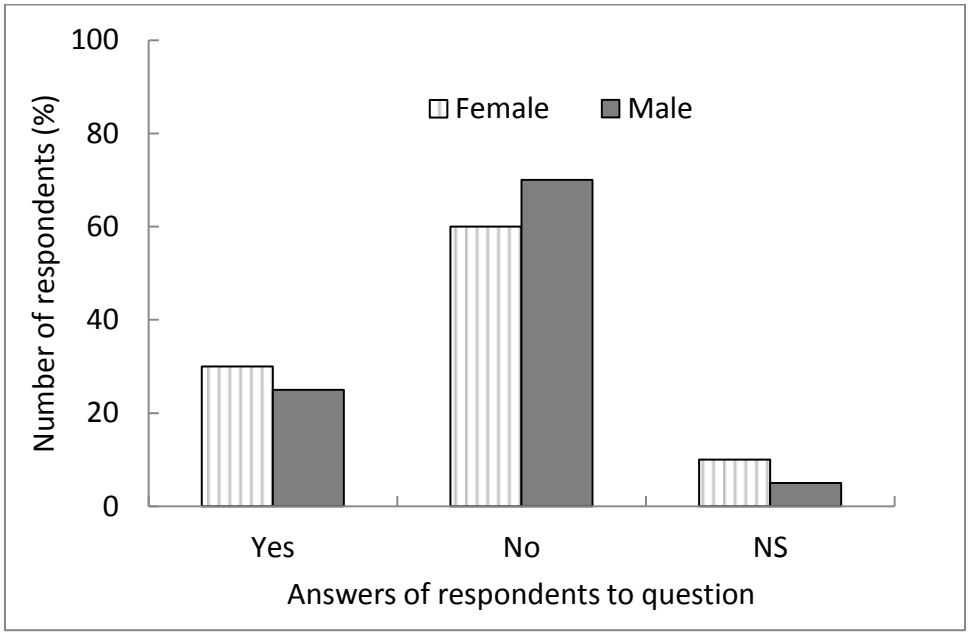

Figure 5. Perceptions of BARD DES on importance of the blended delivery mode.

Studies elsewhere showed students develop interpersonally and emotionally when interacting with fellow students (Schunk, 2008). Online education means students studying in isolation, even if there are electronic discussions and chat forums. Because of the isolation, the natural tendency of students to make friends and interacting with others is limited (Meltzer *et al*., 1975). There is no human interaction to develop interpersonal skills and team spirit. Students tend to work hard by watching over how the rest of their course mates are studying. Working in isolation makes online study boring and ad hoc, leading to confusion, as many students tend to discuss one particular problem or exercise at the same time and procrastinating of intended tasks (Venkatesh *et al*., 2012). One would only imagine how chaotic this can be when an important task, for example, is discussed with a due date approaching (Muijs and Reynolds, 2011). Online education means no interactive (or affective) learning (Rogoff, 2003). A potential disadvantage of this is poor or no practical skills, meaning there is going to be no hands-on training experiences for students who study online (Gilbert, 2001). For instance, in a subject of agriculture, a student can be advised to describe how seeds can be grown or a seed viability test conducted, but

the practicality of doing the real activity would be limited. Such student when graduated will lack basic handling skills and exposure to real-time situations, and regarded as "digital graduates", an important reason why a BDM is important (Jamtsho *et al*., 2009; Bervell & Umar, 2018a; 2018b). Opposing these, 80–90% of the DES indicated study is important, compared to 10–15% that thought interaction is necessary as part of their education.

Community Benefits of Distance Education (Question 4)

Question 4 was strategically developed around the first three questions, Question 3 in particular to understand whether the DES thought providing online education brings university education to the community and is an important community service. That was to show whether DES thought online education is suitable (recommendable) to future DES compared to BDM (Question 3). A demographical separation was done as in Question 3 to clearly present the results (Figs. 6 and 7). A similar number of females (60%) pointed out that bringing HE to the community is important, and on average, 75% of all the male DES thought the same. Some of the reasons pointed out are discussed below. Nearly 30% of the female respondents (Fig. 7) from the two focus groups thought otherwise, bringing HE to the community and allowing DES to stay at home or at the workplace and study, are not important options. Five to ten percent of the DES were undecided or had no idea on whether allowing students to stay away from a formal classroom setting is ideal for learning, particularly the female DES with nearly 10% (Figs. 6 and 7).

Most of the younger students indicated that university campuses have certain levels of security risks (Table 2), implying that younger students tend to think studying by a BDM is important compared to the mature students who indicated security is not a major concern. It is a natural phenomenon some students tend to pick up things and learn much quickly than others, whilst the majority of the students learn from the good students by working with them. Not only that, but mature students from the industries are handy in discussing issues and providing solutions to study problems that are strongly related to their fields of expertise, and assisting inexperienced students of no industry exposure from them is important. In today's technological age (time and space), potential employers need employees who have developed independent skills and abilities to be able to address problems related to work and find solutions. DES further benefit in that online education foster students to be innovative in using electronic communication to interact with fellow students and their teachers, making their own study plans and work according to their schedules, developing a balanced way of life towards work, families, and lifelong learning (Lynch, 2002). Some of the major advantages that were pointed out are shown in Fig. 8, e.g. "flexibility" being the main one. Because DES study from home, parental guidance is guaranteed and there is no need for concern over security and welfare issues, especially for younger students who opt to enrol at a university to study online, including E-learning. Staying within the cycles of parents and the community makes students learn valuable knowledge, such as developing a good attitude and behaviour, which are difficult to develop while attending universities, better still, not taught. This group of students are even under the direct supervision of the parents, therefore, poor performance in assessments and failures are obvious and make parents aware of this shared commitment and responsibility in the overall success of the DES. This would translate into stronger ties if "special students" are assisted to enhance their employment skills or further their education online, some important community services that cannot be provided by the BDM.

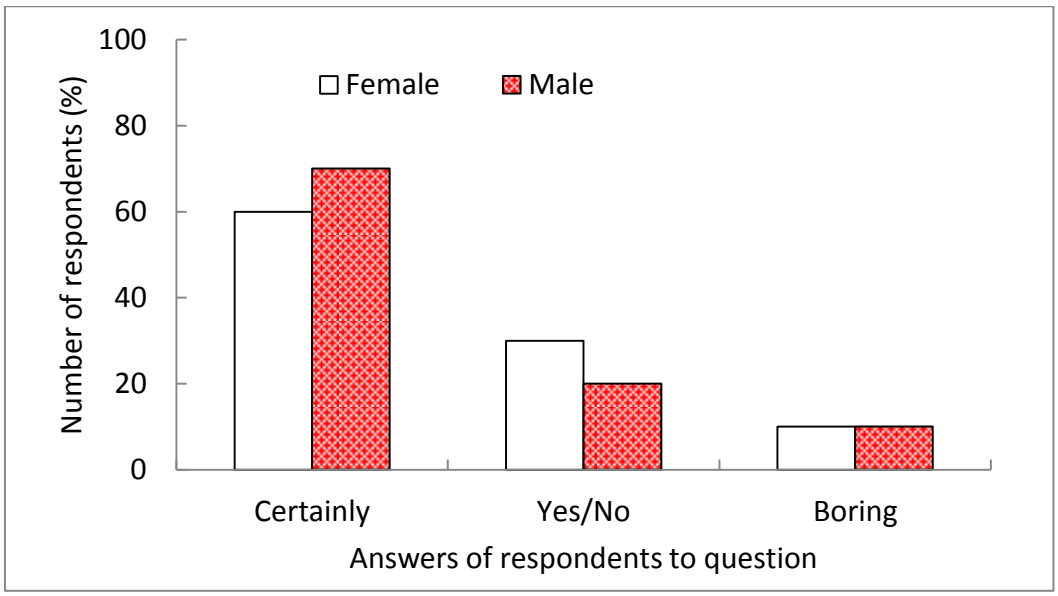

Figure 6. Perception of DODL DES on distance education as a community service.

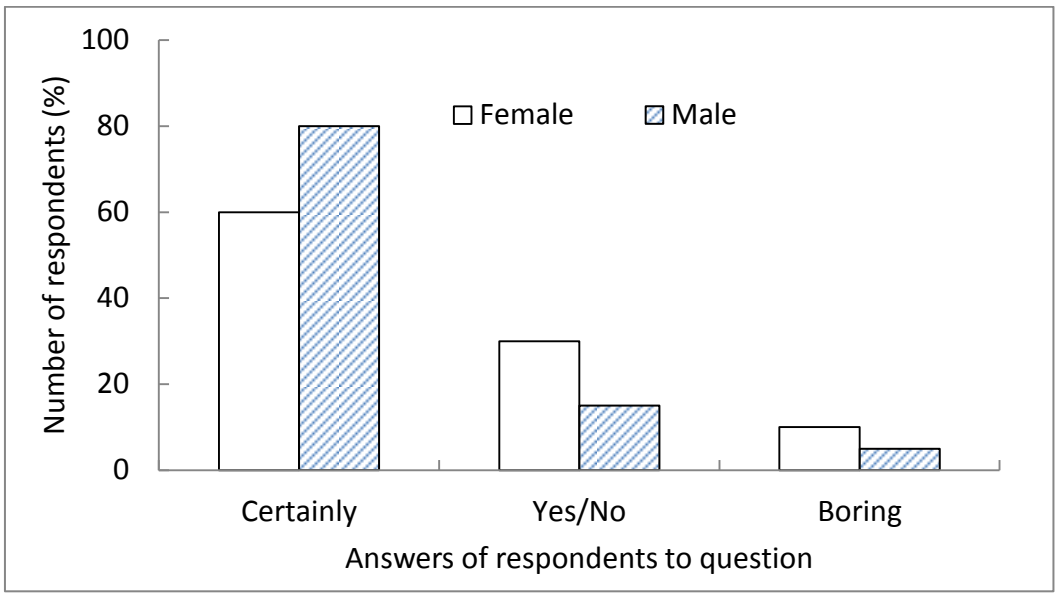

Figure 7. Perception of DODL DES on distance education as a community service.

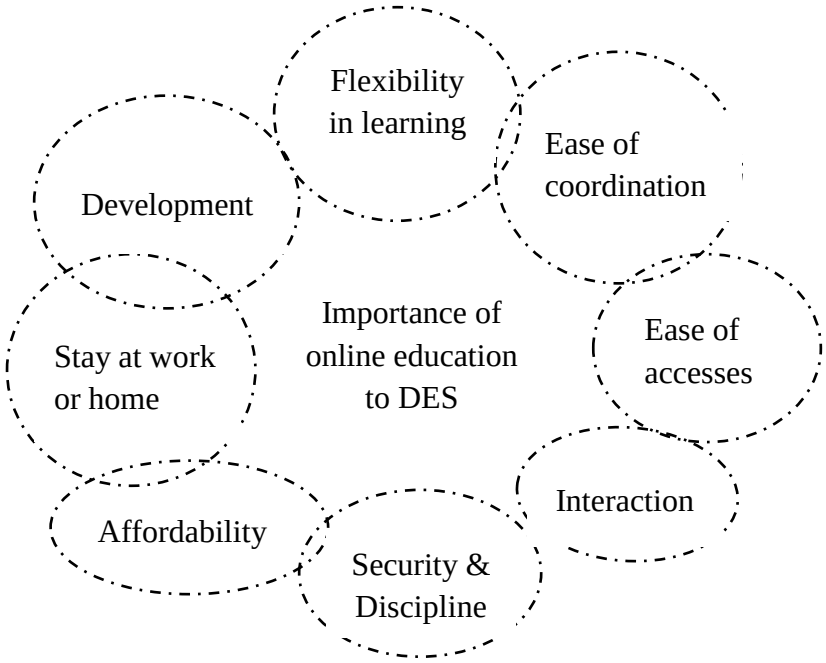

Figure 8. Advantages of online education to communities.

Through online education, there is flexibility in class attendance, with efficient internet service (Thompson, 1995). Provided coordination is timely from the provider and student-centred, the course is there 24 hours a day, 7 days a week, and at the reach of the students. If a difficulty arises in a course material or an exercise, the student can use "instant messaging applications" such as "Facebook, Whatsapp and other video conferencing applications" to get in touch with the subject teachers, meaning needed help is not far from DES. As traditionally done, students do not need to queue up offices or feel pumped to approach a teacher for help. Students need to relax away from the hassles of facing a teacher at ease to seek help online. Students having effective access to internet facility means the tradition of going to the library to do research is of the past, as online course materials clearly point out where more information is available, such as references to relevant databases or copies of e-books.

Technology and gadgets with modern application tools for teleconferencing are widely available, from the very cities to some of the remote areas which are making online education free. Students and teachers can use such applications to discuss issues related to the courses delivered online without any let or hindrance (Bonk & Graham, 2006). Apart from social media and instant messaging applications, email, chat forums, Google Classroom, Moodle and one-on-one discussion groups can be created and developed into user-friendly approaches to foster effective learning and constant dialogue (Thompson, 1995). In a similar way, course mates

can easily be networked so that students share their experiences and skills, e.g. in a Goggle Classroom or ZOOM Meeting. Networking students through forums is one way of enhancing students to interact, develop teamwork and interpersonal skills, and learn. It is an effective way to make sure students lower total reliance on the teachers for security and other reasons, such as during a period of sickness and students need immediate help.

Online courses are an advantage to special students (e.g. on a wheelchair and impaired mobility) where family members or parents have to be available to give support for full-time study. For such students, parents, siblings, and even spouses are all at the reach while studying online and from home. Student, medical, and personal help needed can easily be sought with the understanding that the student is a special student, and someone has to be nearby to help from the comfort of the home. The courses being brought to the community where there is a need is "bring the university to the community", which would foster strong relationships and keep up the reputation of HE in the communities (Larson & Murray, 2008). In terms of meeting the ever-increasing university fees, online courses are seen to be less expensive (Table 2), in part that students opt to study electives subjects (Jones & McNally, 1997) or choose to pay as they study. Parents or employers have to pay the fees of subjects enrolled and more costs associated with it only. This is a welcome relief for the parents who are normally under pressure trying to meet the fees prior to their students entering a university, and that all fees have to be paid up front, often within a given time. Through online education, payments can be spread over time, or maybe course dependent, providing the flexibility and spread of payment.

IV. Conclusions

Distance education provided by HE globally is faced with a number of challenges, e.g. inadequate facilities and infrastructure to low faculty strength, lack of financial support, political interference, and inability to convince willing students to study. This study showed younger and unemployed DES tended to favour a BDM compared to the mature and employed. The opinion of the younger group of DES was that HE is meant to be provided from a university setting and that is BDM is necessary because the older DES perception was that so long as the same materials are delivered online, BDM is not important. Nearly all the DES thought online education is an extension of classical education that brings university education to the community; however, worried not even the best online course can replace fully the personal contact of a teacher and a student, or the learning processes that are facilitated by the human relationships that develop. Therefore, traditional classes should not be completely replaced with online education but joined to avoid making learning completely online, producing "digital graduates". More than 85% of the DES's perception was that a combine online education with an opportunity to blend to enhance visual, auditory, kinaesthetic, and reading and writing is an ideal approach for an effective online education. The perception of the younger students (DODL) was that HE learning should be on-campus, compared to the older students (BARD) who thought a blended mode, is desirable. This study needs to be extended to other HE institutions to clearly establish the perceptions of the DES on distance education delivery modes used in PNG.

Acknowledgement

This study tried to establish the delivery mode that is best suited to all distance education students, especially from a developing country HE perspective. I'm indebted, as a distance education educator, to all those anonymous students who have voluntarily took part in the study and provided the answers to the questionnaire.

References

[1] Adams, T., & Clark, N. (2001). *The internet: Effective online communication*. Harcourt Forth Worth, pp. 368.
[2] Agassiz, E. C. (1971). Society to encourage studies at home. In O. Mackenzie & E. L. Christensen (Eds.), *The changing world of correspondence study* (pp. 27–30). University Park, PA: Pennsylvania State University Press.
[3] Allen, I. E., Seaman, J., Lederman, D., & Jaschik, S. (2012). Conflicted: Faculty and online education, 2012. Washington, DC: Inside Higher Ed, Babson Survey Research Group, and Quahog Research Group.
[4] Senaidi, S., Lin, L., & Poirot, J. (2009). Barriers to adopting technology for teaching and learning in Oman. *Computers & Education, 53*, 575-590.
[5] Andersson, A., & Grönlund, Å. (2009). A conceptual framework for e-learning in developing countries: A critical review of research challenges. *The electronic Journal of information systems in developing Countries*, 38, 1–16.
[6] Aoki, K. (2012). Generations of distance education: Technologies, pedagogies, and organizations. *Procedia - Social and Behavioral Sciences*, 55, 1183–1187.
[7] Baggaley, J. (1999). The impact of information technology on national and transnational education. In S. Bond & J. P. Lemasson (Eds.), *A new world of knowledge: Canadian universities and globalization* (pp. 183-199). Ottawa: AUCC/CIDE/IDRC.
[8] Baran, E., & AlZoubi, D. (2020). Affordances, challenges, and impact of open pedagogy: examining students' voices. *Distance Education*, 41, 2, 230-244.
[9] Baran, E., & Correia, A.-P. (2009). Student-led facilitation strategies in online discussions. *Distance Education*, 30(3), 339–363.
[10] Basheka, B.C., Muhenda M.B., & Kittobe, J., (2009). *Programme Delivery, Quality Benchmarks and Outcomes Based Education at Uganda Management Institute: A correlational approach*. NCHE, Kampala.
[11] Bates, A. W. (2004). *Managing technological change: Strategies for leaders in higher education*. CARNet, Zagreb, pp. 181.
[12] Benson, A. (2003). Dimensions of quality in online degree programs. *The American Journal of Distance Education*, 17, 145–159.
[13] Bergmann, H. F. (2001). The silent university: The society to encourage studies at home, 1873–1897. *New England Quarterly*, 74, 447–477.
[14] Bervell, B., & Umar, I. N. (2018a). Utilization decision towards LMS for blended learning in distance education: Modelling the effects of personality factors in exclusivity. *Knowledge Management & E-Learning*, 10(3), 309–333.
[15] Bervell, B., & Umar, I. N. (2018b). Blended learning or face-to-face? Does tutor anxiety prevent the adoption of learning management systems for distance education in Ghana? *Open Learning: The Journal of Open, Distance and e-Learning*, 1–19. https://doi.org/10.1080/02680513.2018.1548964.
[16] Black, L. M. (2013). A history of scholarship. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 21–37). New York, NY: Routledge.
[17] Bogdanović, M. (2012). Growing importance of distance education. *I. J. Modern Education and Computer Science*, 3, 35-41.
[18] Bonk, C., & Graham, C. (2006). Future directions of blended learning in higher education and workplace learning centres. In C. Bonk & C.

Graham (Eds.), *The handbook of blended learning: Global perspectives, local designs*. San Francisco: Pfeiffer.
[19] Bourdon, J., Frölich, M., & Michaelowa, K. (2010). Teacher shortages, teacher contracts and their effect on education in Africa. *Journal of the Royal Statistical Society: Series A,* 173, 93–116. https://org.doi/10.1111/j.1467-985X.2009.00601.x
[20] Bunoti, S. (2011). *The quality of higher education in developing countries needs professional support*. Paper presented at 22nd International Conference on Higher Education. Retrieved from http://www.intconfhighered.org/FINAL%20Sarah%20Bunoti.pdf
[21] Crichton, S., & Childs, E. (2008). Looking forward: stories of practice. In *Education for a digital world: Advice, guidelines, and effective practice from around the globe*. Vancouver: BC Campus and Commonwealth of Learning.
[22] Gilbert, S. D. (2001). *How to be a successful online student*. McGraw-Hill, New York, pp. 267.
[23] Gracia, E., and Weiss, E. (2019). The teacher shortage is real, large and growing, and worse than we thought. Economic Policy Institute, Washington DC. Retrieved from https://www.epi.org/publication/the-teacher-shortage-is-real-large-and-growing-and-worse-than-we-thought-the-first-report-in-the-perfect-storm-in-the-teacher-labor-market-series/.
[24] Guri-Rosenblit, S. (2009a). *Digital technologies in higher education: Sweeping expectations and actual effects*. New York, NY: Nova Science.
[25] Haughey, M. (2010). Teaching and learning in distance education before the digital age. InM. F. Cleveland-Innes, & D. R. Garrison (Eds.), *An introduction to distance education: Understanding teaching and learning in a new era* (pp. 46–66). New York, NY: Routledge.
[26] Horton, W. (2000). *Designing Web-based training: How to teach anyone anything anywhere anytime*. Wiley, New York, pp. 607.
[27] Jaggars, S. S. (2013). Online learning in community colleges. In M. G. Moore (Ed.), *Handbook of Distance Education* (pp. 594–608). New York, NY: Routledge.
[28] Jamtsho, S., Rinchen, S., Khan, Z., Sangi, N., Ahmed, S., & Samaranayake, V. (2009). Accessibility, acceptance and effects of distance education in South Asia. In J. Baggaley (Ed.), *Distance Education in China and India: Collectivism and Connectivism. Distance education technology in Asia*. New Delhi: Sage. Retrieved 20 June 2020 from www.pandora-asia.org/downloads/Book-2/PANdora-book2_v6-Chap2.pdf.
[29] Jasinski, M. (2006). *Innovate and integrate: Embedding innovative practices*. Brisbane, QLD: Australian Flexible Learning Network.
[30] Johnson, J. L. (2003). *Distance education: The complete guide to design, delivery and improvement*. New York: Teachers College Press.
[31] Jones, B. W., & McNally, D. (1997). *The importance of distance education in the developing world*. I. A. P. P. P. Communication No. 63, pp. 13-15.
[32] Larson, R. C., & Murray, M. E. (2008). Learning as a tool for poverty reduction and economic development: A focus on China and Mexico. *Journal of Science Education and Technology*, 17, 175-196.
[33] Lee, K. (2017). Rethinking the accessibility of online higher education: A historical review. *Internet and Higher Education*, 33, 15-23.
[34] Lee, K. (2020). Who opens online distance education, to whom, and for what? *Distance Education*, 41, 2, 186-200. https://org.doi/10.1080/01587919.2020.1757404
[35] Lynch, M. M. (2002). *The online educator: The guide to creating visual classroom*. Routledge Falmer, London, pp. 170.
[36] Martin, J. (2009). Developing course material for online instruction of adults. *Journal of Online Learning and Teaching*, 5, 364.
[37] Melton, R. F. (2002). *Planning and developing open and distance learning: A quality assurance approach*. Routledge Falmer, London, pp. 223.
[38] Meltzer, B. N., Petras, J. W., & Reynolds, L. T. (1975). *Symbolic interactionism*. London: Routledge & Kegan Paul.
[39] Michael, P. S. (2019). Current evidences and future projections: a comparative analysis of the impacts of climate change on critical climate-sensitive areas of Papua New Guinea. *Journal of Soil Science and Agroclimatology*, 16, 229-253.
[40] Muijs, D., & Reynolds, D. (2011). *Effective teaching: Evidence and practice*. London: Sage.
[41] Nguyen, T. (2015). The effectiveness of online learning: Beyond no significant different difference and future horizons. *MERLOT Journal of Online Learning and Teaching*, 11, 309-319.
[42] Online Learning Task Force, (2011). Collaborate to compete: Seizing the opportunity of online learning for UK higher education. Retrieved from http://www.hefce.ac.uk/media/hefce1/pubs/hefce/2011/1101/11_01.pdf
[43] Pajo, K., & Wallace, C. (2001). Barriers to the uptake of web based technology by university teachers. *Journal of Distance Education*, 16, 70-84.
[44] Peters, O. (2008). Transformation through open universities. In T. Evans, M. Haughey, & D. Murphy (Eds.), *International Handbook of Distance Education* (pp. 279–302). Bingley, UK: Emerald Group Publishing Limited.
[45] Picciano, A. G. (2017). Theories and frameworks for online education: Seeking an integrated model. *Online Learning*, 21, 166-190. https://org.doi/10.24059/olj.v21i3.1225.
[46] Pintrich, R. P. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory into Practice*, 41, 219-225.
[47] Ramayah, T. (2010). The role of voluntariness in distance education Students' usage of a course website. *Turkish Online Journal of Educational Technology-TOJET*, 9, 96–105.
[48] Reimann, P. (2008). Communities of practice. In H. Adelsberger, P. Kinshuk, J. Pawlowski *et al*. (Eds.), *Handbook on information technologies for education and training*. Verlag Heidelberg: Springer.
[49] Rogers, P. L. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research, 22*, 455-472.
[50] Rogoff, B. (2003). *The cultural nature of human development*. Oxford University Press, Oxford, UK.
[51] Rosenberg, M. J. (2001). *E-learning strategies for delivering knowledge in the digital age*. McGraw-Hill, New York, pp. 343.
[52] Samarawickrema, G., & Stacey, E. (2007). Adopting web-based learning and teaching: A case study in higher education. *Distance Education*, 28, 313-333.
[53] Schunk, D. H. (2008). *Learning theories: An educational perspective*. Upper Saddle River, N. J., Pearson Merrill Prentice Hall.
[54] Shin, W. S., & Kang, M. (2015). The use of a mobile learning management system at an online university and its effect on learning satisfaction and achievement. *The International Review of Research in Open and Distributed Learning*, 16, 110–130.
[55] Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15, 157-190.
[56] Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers in Education*, 50, 1183–1202.
[57] Suresh, S. E. M., & Kumaravelu, A. (2017). The quality of education and its challenges in the developing countries. American Society for Engineering Education, Columbus, Ohio, USA. Available at https://peer.asee.org/the-quality-of-education-and-its-challenges-in-developing-countries.pdf. Accessed 15th July 2020.
[58] Thompson, V. (1995). *Importance of Distance Learning*. Retrieved 15th July 2020 from http://everydaylife.globalpost.com/importance-distance-learning-16104.html.
[59] Tracey, M. W., & Richey, R. C. (2005). The evolution of distance education. *Distance Learning*, 2, 17–21.
[60] Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36, 157–178.
[61] Verduin, J. R., & Clark, T. A. (1991). *Distance education: The foundations of effective practices*. San Francisco, CA: Jossey-Bass.
[62] Vialle, W., Lysaght, P., & Verenikina, I. (2005). *Psychology for educators*. Melbourne: Social Science Press.
[63] Wedemeyer, C. (1981). *Learning at the back door: Reflections on non-traditional learning in the lifespan*. Madison, WI: University of Wisconsin Press.
[64] World Bank. (2000). *Higher education in developing countries: Peril or promise*. Washington, DC.
[65] Xu, D., & Jaggars, S. (2013). Adaptability to online learning: Differences across types of students and academic subject areas. Available from http://academiccommons.columbia.edu/catalog/ac:157286. Accessed 15th July 2020.