Fit-for-Purpose Pharmacy Workforce Development in the Lower Middle-Income Country Context: a mixed methods study of Nigeria.

Submitted by

Ifunanya Jennifer Ikhile

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Publications

Ikhile I. and Chijioke-Nwauche, I. Pharmacy Education in Nigeria: The Progression. *World Journal of Pharmaceutical Research*. 2016; 5(7),258-272. Published 2016 Jun 22. doi:10.20959/wjpr20167-6507

Ikhile I, Anderson C, McGrath S, Bridges S. Is the Global Pharmacy Workforce Issue All About Numbers? *Am J Pharm Educ*. 2018;82(6):6818. doi:10.5688/ajpe6818

Ikhile I, Anderson C, McGrath S, Bridges S. The PharmD Controversy. *Poster Presentations. Pharmacy Practice 2018*. Jun;16(Suppl1):1340. https://doi.org/10.18549/PharmPract.2018.s1.1340

Conferences and Symposia

2017

Health Services Research and Pharmacy Practice Conference (Nottingham, UK)

Attended as Volunteer

Transforming Teaching Programme Conference (Nottingham, UK)

Attended as Pharmacy Educator

NHS Conference Pharmacy Practice Now and in the future (London, UK)

Attended as Pharmacy Educator

Pharmacy Education Conference (Manchester, UK)

Attended as Pharmacy Educator

United Kingdom Forum for International Education and Training Conference (Oxford, UK)

Attended as Pharmacy Educator

Human Resources for Health Conference (Dublin, Ireland)

Attended as Global Health Writer

2018

International Pharmaceutical Students Federation Conference (Lagos, Nigeria)

Attended as Plenary Speaker

Oral Presentation- FIP- Pharmaceutical Workforce Development Goals in the African Context

International Pharmaceutical Federation (FIP) Pharmacy Practice Conference (Lisbon, Portugal)

Poster Presentation- The PharmD controversy: Pharmacy undergraduate programme change in the context of a developing country

International Pharmaceutical Federation (FIP) World Congress (Glasgow, Scotland)

Poster Presentation- Stakeholder engagement in ensuring a needs-based programme for undergraduate pharmacy education.

2019

Annual Teaching and Learning Conference (Nottingham, UK)

Attended as Pharmacy Educator

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Monash Pharmacy Education Symposium (Prato, Italy)

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Time to actualize another dream……..

To God be all glory!

List of Abbreviations

BMAS- Benchmark Minimum Academic Standards

BPharm- Bachelor of Pharmacy

cGMP- current Good Manufacturing Practice

cGMP- current Good Manufacturing Practice

CHAI- Clinton Health Access Initiative

CPD- Continuing Professional Development

FCO- Foreign and Commonwealth Office

FFP- Fitness-for-purpose

FIP- International Pharmaceutical Federation

FMOH- Federal Ministry of Health

FPGOP- Foreign Pharmacists Graduate Orientation Programme

GbCF- Global Competency Framework

GHWA- Global Health Workforce Alliance

HE- Higher Education

HIC- High Income Country

LIC- Lower Income Country

LMIC- Lower Middle-Income Country

MCPD- Mandatory Continuing Professional Development

MDGs- Millennium Development Goals

MMM- Mixed Methods Methodology

NAFDAC- National Agency for Food and Drug Administration and Control

NBE- Needs-Based Education

NDLEA- National Drug Law Enforcement Agency

NS- Nanjing Statements

NUC- National Universities Council

PBL- Problem-Based Learning

PCN- Pharmacists Council of Nigeria

PEP- Pre-registration Examination for Pharmacists

PharmD- Doctor of Pharmacy

POMs- Prescription Only Medicines

PSN- Pharmaceutical Society of Nigeria

PWDGs- Pharmaceutical Workforce Development Goals

SDGs- Sustainable Development Goals

SIWES- Student Industrial Work experience scheme

SPSS- Statistical Package for Social sciences

UN- United Nations

UNDP- United Nations Development Program

UNFPA- United Nations Population Fund

USAID- United States Agency for International Development

UTME- Unified Tertiary Matriculation Examination

WHO- World Health Organization

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Abstract

Background

The global challenge of inefficient workforce development is not equally experienced. Low and Lower-Middle Income Countries (LMICs) often have the lowest health workforce capacity yet the highest burden of disease. Pharmacists, the most accessible healthcare professionals in many LMICs, are few in number and often ill-prepared for their roles. A discrepancy between acquired and required skills are among several other challenges which continue to undermine both national health status in LMICs, as well as efforts towards the achievement of global health goals. While several studies highlight this imbalance as a major contributory factor to the poor health status in LMICs, little empiric research explores this phenomenon or identifies possible ways to address it.

Aim

This three-phase mixed methods study aimed to identify key domains for fit-for-purpose pharmacy workforce development in Nigeria, taking into account concerns and priorities, and hinged on stakeholder engagement to enhance an understanding of pharmacy workforce development as well as ensuring shared ownership for decisions. The first objective was to determine the current status of pharmacy workforce development in Nigeria from stakeholder perspectives, the second to identify key domains for needs-based workforce development in the LMIC context. The third objective was to highlight major barriers and facilitators to workforce development and to the proposed programme change, and the fourth to determine local and global compliance of the Nigerian pharmacy programmes. This was done by comparing the standard Basic Minimum Academic Standard (BMAS) for both programmes with a drafted composite of both locally determined and global standards.

Methods

Fieldwork involved both individual and group interviews with pharmacy education stakeholders in the first phase: education regulators, educators, students, interns, employers of pharmaceutical labour and pharmacists in various sectors of practice, across all geopolitical zones of the country. In the second phase, themes from stakeholder's qualitative responses were used to develop a survey, and descriptively analysed to determine the strength and national breadth of opinions. Finally, documentary analysis complemented qualitative and quantitative results.

Results

Most stakeholders in academic and regulatory leadership cadres had largely positive opinions, while stakeholders in other areas of practice, pharmacists in

lower cadres, employers and students had mostly neutral to negative views about the current status of pharmacy workforce development in Nigeria. Hence, views depended on demographics: the cadre, sector of practice and geopolitical zones of stakeholders in question.

Throughout the study, three domains were identified: Education Capacity, Professional Relevance, and Systems Efficiency. Participants described a fit-for-purpose programme as one which meets global as well as local standards, assures and maintains these standards, prepares pharmacy students for current and future practice experiences, ensures professional recognition within an enabling environment, maximizes outcomes given available resources through equitable and efficient management, and ensures that these are fairly and impartially experienced across the country. This description was in line with global recommendations for a fit-for-purpose pharmacy programme.

For stakeholders, the major barrier to a clinically focused patient-centred pharmacy programme was medical doctors' resistance. Other barriers included poor funding worsened by corruption, leading to poor infrastructure, poor research output, poor remuneration of staff, plus other barriers and system issues. Most barriers described were socio-economic. I therefore argue that since the education sector may not rise above economic and social boundaries imposed on it, rather than attempting to solve individual problems, a systems-approach towards handling issues may lead to much needed holistic change. Some facilitators identified included a general stakeholder interest in pharmacy education improvement, and specialist training for educators being held in collaboration with American clinical pharmacists in preparation for the PharmD, an initiative which provided an uncommon improvement opportunity if appropriately implemented.

Qualitative content analysis revealed a 72% match with composite standards (36 codes out of 50), and 86% match (24 codes out of 28) with curricular components. Few domains not coded by BMAS included student support, evidence-based care, social determinants of health, patient safety, policy and implementation, collaboration and teamwork, prudence and resource efficiency, specialization, research intensity, professional recognition and role specificity. Despite these discrepancies, the 72% and 86% match for standards and curricular components respectively, showed that both global and local recommendations had been taken into consideration in the development of the BMAS. The challenges of workforce development in Nigeria therefore would likely not be due to deficient recommendations or standards but non-implementation of available ones.

Conclusion

Stakeholders were in consensus about the need for improved workforce development in Nigeria. This would involve a fit-for-purpose pharmacy programme according to participants' description above, as well as a commitment to life-long learning. Identified barriers would also need to be surmounted and facilitators harnessed to ensure sustainability of such a programme, as well as a focus on collaborative partnerships between education and practice in the implementation of available local and global standards. Adopting recommendations for a programme training fit-for-purpose pharmacists, based on study findings, could mean giant steps towards addressing education-practice mismatch, which could improve the national health status, and ultimately contribute to the achievement of global health goals.

1 Chapter 1: Introduction and Literature Review

1.1 Introduction

This chapter highlights global health inequities caused by several challenges that undermine workforce capacity leading to poorer health indices in Lower-Middle Income Countries (LMICs). It argues for needs-based workforce development as a possible solution and provides contextual understanding into Nigerian pharmacy practice. Figure 1.1 below shows the chapter at a glance.

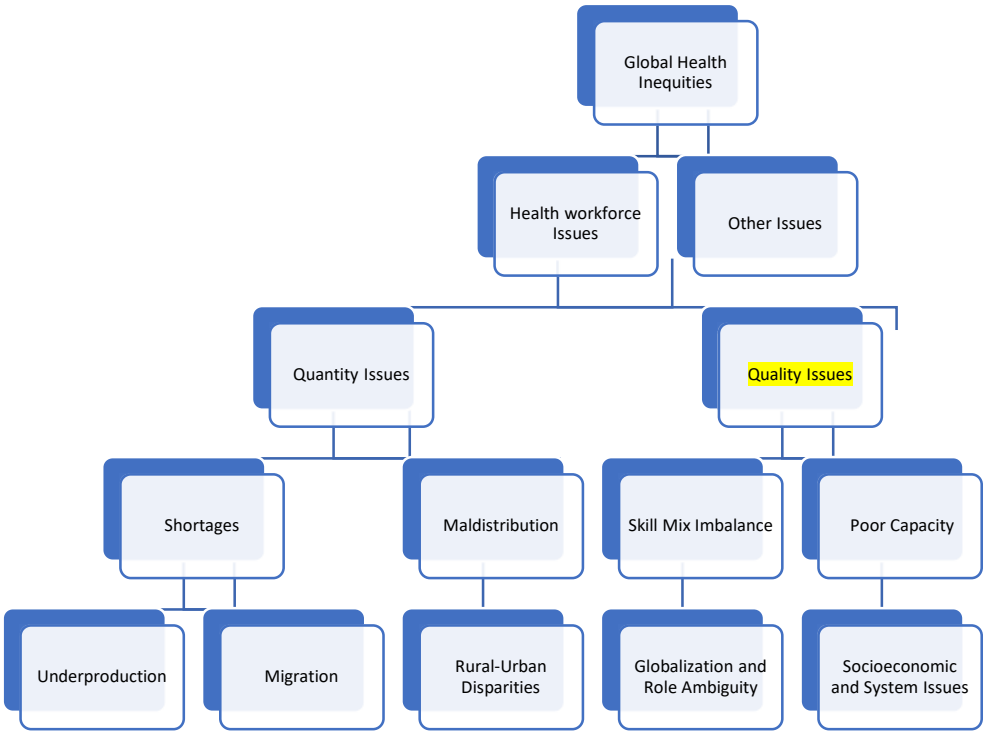

Figure 1.1: Chapter 1 at a glance

1.2 Background and Literature Review

1.2.1 Health Inequities

Health inequities and associated challenges have been extensively researched (Anderson, 2008; Roush, 2013; UN, 2006; Levy, 2003; Travis, 2004) and reported by global organizations, yet they continue to undermine concerted efforts towards global progress (WHO, 2019). The WHO (2019) showed marked inequity in access to and quality of health between LMICs and high-income countries (HICs) which are both startling and incapacitating, as reflected in health indices shown in figure 1.2 below. Similarly, FIP workforce intelligence (2018) recorded the slowest growth in pharmacists' capacity in LMICs over a 10-year period, shown in figure 1.3 and smallest health workforce numbers (figure 1.5). Global efforts, including focused policies towards improving the health conditions in LMICs have been made, but succeeding reports similarly acknowledge definite but insufficient progress. Carter-Pokras and Baquet, (2002) however showed that these health

disparities and differences in health status are measurable, unnecessary, and preventable.

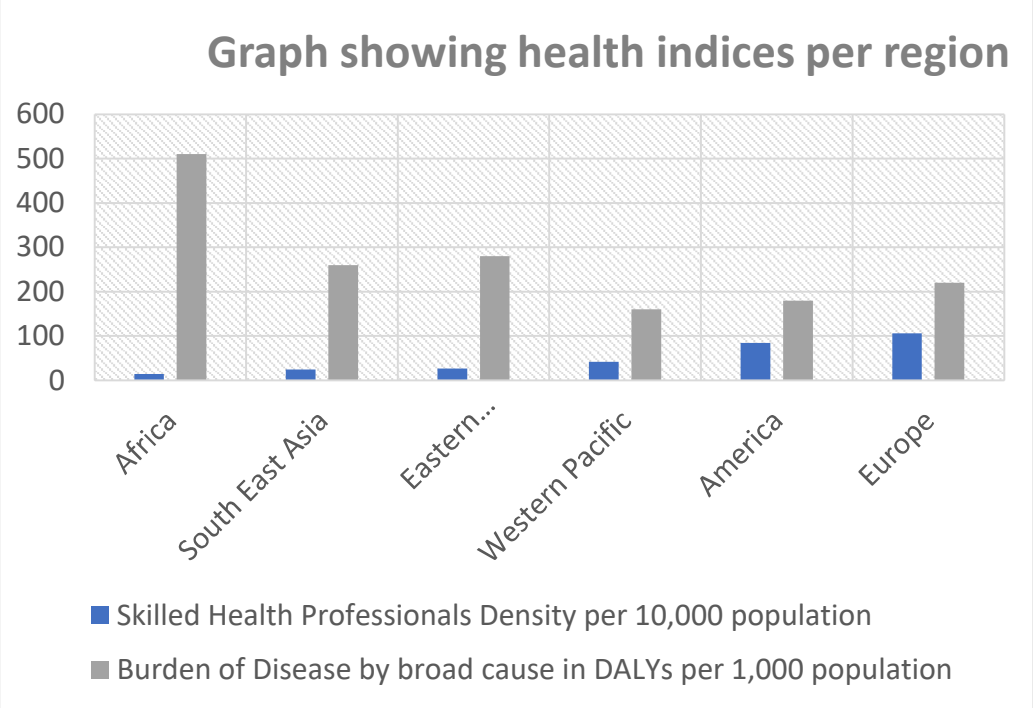

Figure 1.2: Health indices per region (WHO, 2013)

The 21st century has seen major advances in healthcare; the scale, scope, and complexity of which is unprecedented, due to the accumulation of capital as well as a quantum leap in medical knowledge and technology. However, many Low and Lower-Middle Income Countries (LMICs) are yet to benefit from these achievements and continue to face serious health crises (Frenk, 2010; WHO, 2019). One of the most challenging issues remains preparing an adequate number of health workforce to function optimally in a rapidly changing, interconnected world (Dovlo, 2007). This is more so in the LMIC context where change is slow due to scarce human and material resources, and expertise for effective training largely unavailable (Anderson and Futter, 2009; Dayrit and Dolea, 2006). Also, an understanding of development as westernization as well as artificial limitations placed on pharmacists' roles often leads to skill mix imbalance (Babar et al., 2013; Roush et al., 2013) and ill-prepared graduates for the local context. Rapid shifts in health-seeking behaviour and usual health practices in these contexts such as the replacement of hospital-based care by community (pharmacy)-based management due to convenience, proximity, and cost considerations, a transition in ailment pattern from acute short term to chronic long-term requiring more frequent pharmacy visits and health management plans, new models of care underpinned by technology, as well as expanding health and social care needs of populations (Lueddeke, 2012) mean that pharmacists are at the frontline, yet constantly face doubts regarding their abilities to adopt

and maintain professional standards of knowledge, skills and attitudes (Ryan and Deci, 2002). Existing workforce shortages worsened by wide-ranging demand and supply factors affecting workforce migration (Chen et al., 2004; Babar et al., 2013; Islam et al., 2014), alongside geographic disparities in workforce distribution (Roush et al., 2013) mean that there are fewer health workers available to cater to an expanding population. Hence, access to healthcare is poor, and worse in rural settings.

While these issues are challenging in themselves, a combination of them, plus others discussed below create a colossal health crisis (Chen et al., 2004) which must be addressed urgently.

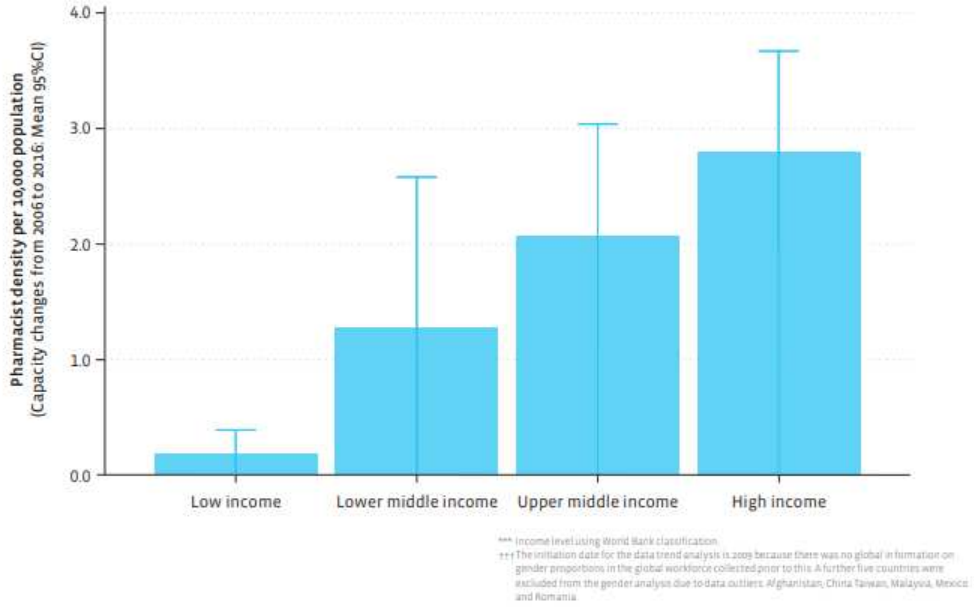

Figure 1.3: Absolute change in pharmacist capacity based on country income level (FIP, 2018)

1.2.2 The Pharmacy Workforce

The pharmacy workforce plays a vital role in improving global and patient health outcomes through effective and responsible medicines management (FIP, 2018). They ensure uninterrupted supply of quality medicines to the population, optimizing effective choices and promoting rational use (FIP, 2012) as part of a multidisciplinary health team. They are the third largest category in the health workforce, at the core of health service provision in LMICs, and contribute meaningfully towards the achievement of global health goals (FIP, 2016). As pharmacies are readily accessible; conveniently located in residential areas, providing services at a lower cost; often with no consultation fees, and requiring no previous booking, pharmacists are the first port of call for healthcare advice and services in most LMICs (Ekpenyong et al., 2018; AlGhurair et al., 2012). Pharmacists represent the health system

at the community level hence their education, training, distribution, planning and governance are critical determinants of health outcomes.

Investing in the scale-up of the health workforce is an objective shared by the WHO, UN Agencies, and other international development organizations, based on a direct link between the number and competency of health workers and population health outcomes (WHO, 2014; Dayrit and Dolea, 2006; Wuliji, 2009; Anand and Bärnighausen, 2004; Bossert et al., 2007). Workforce development is priority in the global health agenda being possibly the biggest challenge to the attainment of health system goals especially in Africa (Dovlo, 2007).

The World Health Report (WHO, 2006) first highlighted these issues where 57 countries out of 192 were identified as having gross workforce shortages. 36 are in sub-Saharan Africa, with Nigeria being one of them. Subsequent reports revealed how health workforce issues had hampered the implementation of primary care, health service coverage (WHO, 2008a; WHO, 2010), and internationally co-ordinated responses over several years (WHO, 2008c; Bhutta et al., 2010; WHO, 2011; WHO, 2016). FIP workforce development goals (WDG's) focus on education providers, pharmaceutical workforce, policy, government and systems as channels through which global development of pharmacy must occur (FIP, 2016), and a roadmap consisting statements of action have been adopted (FIP, 2017).These documents represent the global position on pharmacy workforce development and are used as global standards for documentary analysis in chapter 6.

Figure 1.4 shows three major challenges identified: numbers, distribution, and training. Hence, this research focuses on fit-for purpose training as a possible solution to education-practice dissonance observed in LMICs (Roush et al., 2013, Babar et al., 2013).

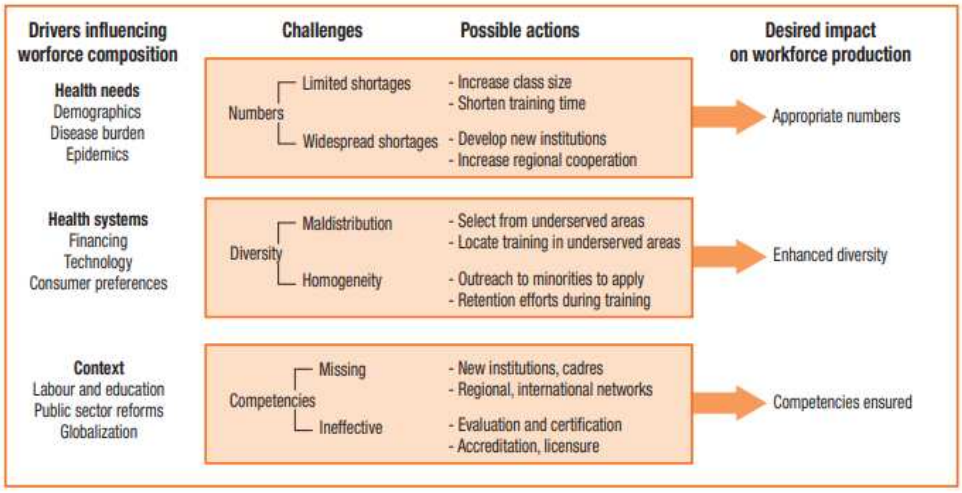

Figure 1.4: Challenges to health workforce production (WHO, 2006)

Global efforts have not cascaded to the national level in many LMICs, and workforce development is often neglected (Rigoli and Dussault, 2003) during professional discussions for pharmacy transformation. When it is considered, solutions are typically reactive, non-context specific, unfit for purpose, and with a short-term vision (Dussault and Dubois, 2003). Most discussions focus on wholesale adoption of western development efforts and curricula (Babar et al., 2013) which are often unsuitable for the LMIC context. Others focus solely on increasing workforce numbers, which alone may not resolve the crisis, as workforce quality is of equal if not greater importance (Ikhile et al., 2018).

Fit-for-purpose workforce development has not been a priority area in the LMIC context, or efforts have not produced desired results. Gross shortages still exist (See figures 1.3 and 1.5), as well as training deficiencies, despite these countries bearing a disproportionately higher global burden of disease (WHO, 2013). For example, Africa, which suffers 24% of the global burden of disease, has only 3% of global healthcare workers.

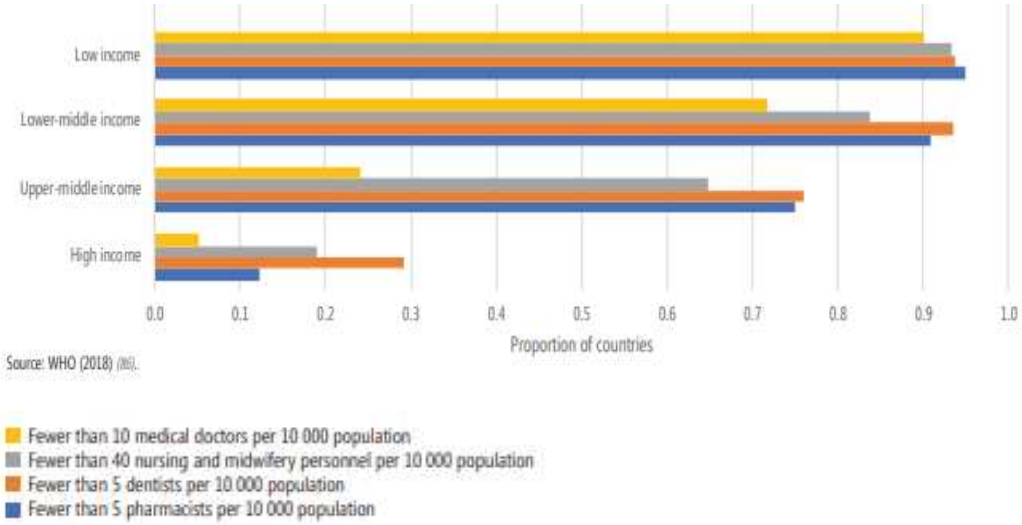

Figure 1.5: Proportion of countries with insufficient healthcare professionals by income group 2013-2018 (WHO, 2018)

1.2.3 Workforce Development Challenges

1.2.4 Education

Despite paucity of research, barriers to quality education and capacity-building abound in most LMICs. A major challenge is poor funding (Gazzola and Didriksson, 2008), which is a global problem, and the root cause of other challenges (Akinyemi, 2013), including poor research output (WHO, 2017), misdirected public health focus: With a lack of grants, a tendency to follow the money steers research towards more lucrative areas, potentially decreasing the capacity for educators to respond to basic public health needs (WHO, 2016), among others. This also cuts across various tiers of education. Inadequate financing at the secondary school level leads to low enrolment

and high dropout rates (UNESCO, 2004) limiting admission pools for higher education.

Dysfunctional pharmacy school admission processes and policies are based on quota systems and catchment area (Omeje et al., 2016), rather than merit. Disproportionate admission from dominant ethnic groups and higher social classes is also common (Mc Lachlan, 2005). A growing awareness of the importance of student diversity has highlighted these issues. These policies often lead to high student attrition rates of about 20-30% (Huda and Agha, 2004) due to poor academic performance. However, it is not enough to admit the right students, structures and support must be implemented to ensure they do not drop out (Simpson and Budd, 1996). In this regard, lessons can be learnt from the global north where tutoring, career counselling and guaranteed placements after school have improved retention rates (Holt, 2005; Jalili-Grenier and Chase, 1997; Pechura, 2001).

Other challenges include insufficiency and obsolescence of resources and technology (Anderson et al., 2012; Roush et al., 2013) - again through poor funding. Lack of clinical placement sites, hence a deficiency in experiential training occurs (Kheir et al., 2008). Others include the attitude of neglect or poor maintenance of public structure and infrastructure, political unrest and economic failure (Matowe et al., 2004), weak leadership to improve health systems, gender stratification, conflicting roles, reluctance towards inter-professional education, faculty shortages. Corruption, which permeates every sector in the country (Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015), embezzlement of public funds for education (Ololube, 2016). Industrial action (Adavbiele, 2015), an acutely gerontocratic higher education system leading to system rigidity and resistance to new ideas (Okoduwa, 2006), a perceived lack of opportunities, poor educator training and development, poor staff remuneration, poor working conditions (Matowe et al., 2004) are further challenges.

1.2.5 Practice

A systematic review (Hawthorne and Anderson, 2009) has highlighted the complexity of workforce issues.

Workforce retention was hampered by several factors mitigating job satisfaction such as curricula misalignment with practice (Smith, 2001) especially in LMICs, poor remuneration, political and social instability. In Iraq, years of war and an oppressive regime caused pharmacists to flee the country, making it a haven for illegal drug vendors and counterfeit medicines (Kheir et al., 2008). Poor living and working conditions: In Nigeria, about a third of the total pharmacist population had emigrated by 2014 and were practising abroad leading to a pharmacist to population ratio of 1:10,000 at that time (Ojo, 2016) a long way from the WHO recommended 1:2,000. Emigration aggravates an already precarious workforce crisis, especially when

considered against a backdrop of oversupply of pharmacists in HICs and a gross shortage in LMICs, and the high global burden of diseases and increasing incidence of tropical diseases in LMICs. However, this touches on the complex issue of international mobility which has no immediate solution (Levy, 2003). The need for global mobility is increasingly important (Ahmed and Ahmad Hassali, 2008), yet emigration of highly skilled professionals from LMICs is a source of international concern (Matowe et al., 2004; Kheir et al., 2008; Wuliji et al., 2009) due to resulting gross shortages. Since LMICs have some of the highest population to pharmacist ratios (FIP, 2018), they should focus on workforce retention and increase, rather than emigration. That being said, realistically, emigration will likely continue until conditions in LMICs improve, hence, this should be the focus when discussing migration complexities.

In addition to pharmacy workforce shortages in LMICs, geographical distribution is also skewed. A majority of pharmacists practicing in urban areas causes a disparity between access to healthcare in rural and urban areas (Taylor and Harding, 2001; Smith, 2001; Roush et al., 2013). One of the important needs, therefore, is to train pharmacists to meet the medicine-related needs of poorer, less urbanized communities and incentivize them to do same (Thrasher et al., 2012). Similar programmes to that in Syria, where pharmacists must practice in rural areas for at least two years following graduation (Kheir et al., 2008) should be considered. Another strategy/ consideration is task shifting where community health workers are trained to provide basic health services to bridge the workforce shortage gap in rural areas (WHO, 2006).

Ill-defined pharmacist roles cause job dissatisfaction leading to emigration (Babar et al., 2013). The roles of pharmacists within the health team are still in transition in LMIC societies although personal expectations and global roles are changing, opinions of the public and other health professionals about the place of pharmacists lead to the imposition of limits of competencies on them (Babar, 2007; Khan, 2010; Lim et al., 2012). The dissonance of professional identity and role ambiguity mean that education policy makers are unsure of the best programme for effective training of pharmacists, so offer little support to pharmacist struggling with questions of identity. Hence, pharmacists often find themselves in an uneasy co-operation or uncomfortable conflict with other members of the healthcare team and are therefore unable to make meaningful contributions to the national health status (Babar et al., 2013). This is not an issue peculiar to pharmacy. In most professions, traditional roles are blurring (Buchanan and Poz, 2002; Dovlo, 2004; Fulton et al., 2011) and what constitutes a well-rounded health professional in the future keeps changing. There must therefore be a concomitant change in how health professionals are educated and trained, with the focus on increased capacity underpinned by flexibility. However, in LMICs curricula are rigid, and pedagogies static, hence change never catches

up with the dynamic needs of the population served (Roush et al., 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010), Leading to a mismatch between education and the practice context, both in terms of local needs and availability of resources and technology. This discrepancy has also been attributed to a tendency to adopt western education standards that are neither suitable nor applicable to the LMIC context (Babar et al., 2013).

A major factor for a productive workforce is quality education development and training, both in school and post-graduation (Hawthorne and Anderson, 2009). Engaging with CPD is also a positive factor. Recognizing the existence of training gaps, unproductive professional culture, assumptions and biases would be useful as well as deploying appropriate communication skills and utilizing team resources to recognize, diagnose, and address these differences. Without intervention, disparities would continue and the capacity gap between countries would continue to widen. Addressing health inequities involves attending to these issues including upscaling the training of healthcare professionals with focused attempts to bridge skill gaps. Identifying core competencies including lifelong learning and adaptability as well as ensuring availability of required technology and resources for quality education, rather than continually broadening the scope of technical knowledge in health professionals' education.

Some of these and other barriers which emerge are explored in this research in line with existing policies and needs-based education. In an environment where several social issues inhibit excellence in education, these concerns must be considered to ensure sustainable progress.

1.2.6 Globalization and Overgeneralization of Higher Education systems

Higher education (HE) is the facilitator, bedrock and driving force for strong socio-economic, political and industrial development of any nation (Peretomode, 2007). Hence a focus on university training to ensure prosperity in a knowledge-based economy (WHO, 2004). Oketch, McCowan and Schendel (2014) found that in LICs and LMICs higher education appears to have a stronger impact than realised on economic growth, graduate earnings and workplace productivity, and contributes to the strengthening of institutions and the forming of professionals in key areas such as education and healthcare.

There has been an increased drive towards the globalization of higher education in the 21st century (Lauder et al., 2006), brought on by the emergence of this knowledge-based economy which caused a repositioning of education as a key social and economic tool for policy making and other global initiatives (World Bank, 1999; McGrath, 2010). This has increased the pressure on higher education institutions to prepare graduates with appropriate knowledge and skills for the competitive global market and empower them to enhance knowledge exchange (Schwartzman, 2002).

Ongoing efforts towards instituting global communities of practice, global collaboration, and global rankings to ensure that minimum standards are maintained across schools are indicative of this.

However, most education development projects instituted by both local and international organizations have been guided by western standards, being rooted in universalism; a conventional development theory that holds western political, economic, and academic standards as the global norm (Rapley, 2004). Globalization, internationalization, and curriculum standardization in higher education have been described as attempts to 'westernize' the world (Pieterse, 2010). While being laudable efforts towards progress, they may not have turned out quite as expected for LMICs (Lee, 2012). Seeming steps forward such as accessibility of knowledge have only served to create a wider gap between education in HICs and LMICs due to poor information communication technology. Evidence also shows that previously, policy makers, pharmacy professional bodies and regulators did not view the development of pharmacy education in LMICs as significant, hence they were not taken into account when global standards were discussed (Jamshed et al., 2007; Ghilzai, 2008). Global standards were tailored to the concerns and priorities of HICs and policies developed to address the same. Yet in many areas of practice where a difference in context is significant, these standards have been adopted by LMICs (Jamshed et al., 2007; Babar, 2005; Hadi, 2010; Ryan et al., 2008), without amendment. The resulting discrepancy between standards and practice has led to skill mix imbalance among other issues.

Post-modern views on education development challenge the merits of universalism, which tends to overlook socio-cultural characteristics and specific needs (Pieterse, 2010). The United Nations Development Programme (UNDP) rejects the universalism theory which ignores existing capacities in LMICs and replaces them with western knowledge and systems as a form of 'development as displacement' rather than 'development as transformation' (UNDP, 2002). Their position being: outcomes that do not strengthen existing capacities are weak development efforts. In the same vein, FIP, WHO, and UNESCO unanimously agree that the educational design and capacity to develop pharmacists for a diversity of settings (e.g. community, hospital, research and development, academia) across varying levels of service provision, competence, and scope of education (e.g. undergraduate, post graduate, lifelong learning)" must be quality driven and directed towards societal healthcare needs (Anderson et al., 2009). This must be so for the professional to remain relevant to the society requiring pharmaceutical services. Education should therefore be viewed from a fitness-for-purpose perspective, competencies and outcomes reviewed, and curricula modified in the context of national needs and priorities taking into account available resources and the implications of proposed change (FIP, 2013). The FIP

education initiative has urged all countries to thoughtfully and objectively engage with relevant stakeholders in discussions pertaining to needs-based education, recognizing that one size does not fit all, and so 'best fit' approaches should be chosen over 'best practice' ones (Sekhon and Kamboj, 2011). Alsharif (2012) and Hadi (2014) sharing similar views discussed how educational systems can be reconstructed with respect for ethnic, regional, and national identities with a global perspective.

Ultimately, in this era of globalization, local needs should be prioritized and local models that work be embraced as valid examples for learning. This has been acknowledged as the best path towards sustainable development, meeting global needs without compromising local relevance (FIP, 2013). However, globalization remains a useful endeavour. Deployed appropriately, it may help to address common issues, foster shared expertise and experiences, build trust and understanding among nations, and promote an appreciation of cultural and social differences.

1.2.7 Skill Mix Imbalance and Employability

The tendency for LMICs to adopt overgeneralized and ill-suited development programmes often leads to a skills gap or imbalance defined by a mismatch between the combination of activities or skills needed to fulfil a role and the requisite skills possessed by role-holders. This **s**kills gap has been extensively discussed in literature (Matowe et al., 2004; Anderson and Futter, 2009; Levy, 2003; Ghilzai, 2008; Kheir et al., 2008) being identified as one of the reasons for health inequities between HICs and LMICs. Pharmacy education in LMICs may lag behind practice, insufficiently prepare graduates for practice (Matowe et al., 2004), or 'overtrain' graduates for realistically available roles by others (Anderson and Futter, 2009; Levy, 2003; Ghilzai, 2008; Kheir et al., 2008). All cases create an education-practice gap, leading to frustration and a lack of job satisfaction among pharmacists who are therefore unable to provide the best healthcare service to patients.

While this mismatch has a huge impact on health service provision, it also has implications for graduate employability and retention. The World Economic Forum report (WEF, 2018) disclosed that in response to skills gap, employers are twice as likely to employ new staff possessing required skills than to train existing ones. In India a study, showed that 55% of graduates in healthcare were deemed unemployable (Ernst and Young, 2017). Though the measurement of employability varies, studies citing employability levels appear to base them not just on technical skills but on other transferable skills (Fallows and Steven, 2013; Jones, 2013). Opportunities for experiential learning fostered by public-private partnerships are key to building and enhancing transferable skills, both of which are insufficiently practiced in many LMICs. Apart from nationally facilitated initiatives, universities have been unwilling to collaborate with or learn from industry emphasizing a need

to adhere to a strict curriculum rather than keep up with industry changes. Universities have been criticized for inflexible curricula, rote teaching and learning and lack of experiential exposure (Roush et al., 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010; Babar et al., 2013), but academics view industry expectations as often unrealistic and misguided.

Amidst funding cuts, limited study period, and staff shortages, universities usually cannot provide the quality of students required by industry. The curriculum is also inflexible and unable to meet changes. In order to maximize the university's impact, especially considering limitations and resource constraints, skills gap, or needs assessment research such as this may indicate what universities can focus on in student training. Employers should be willing to train and invest in their employees considering that the educational system cannot provide everything (Jones et al., 2001). FIP advocates a focus on non-university graduate training in the form of Continuous Professional Development (CPD) courses which should be introduced at student level, and lifelong learning prioritized in student training with greater emphasis on ''know how'' than ''know all' (Wilson et al., 2005).

1.3 Study Theory

Considering all of the above, and following reports which revealed that higher education was not meeting society's needs (Wingspread Group, 1993), several education reforms have been attempted, some of which include the notion of the learning rather than the teaching institution (Barr and Tagg, 1995). Globally, there has also been a shift from traditional, structure-based education practices in which knowledge acquisition and retention were described as tedious for both students and teachers (Johnson and Finucane, 2000) to competency-based pharmacy education (Bruno et al., 2010; Nash et al., 2015; Caraccio, 2002). This has also been the case in other health professional domains such as medicine (Frank et al., 2010), dentistry (Spielman et al., 2005) and earlier for nursing (Girot, 1993). Brownie et al. (2011) made us realize that since the introduction of competence, philosophical debates and controversies have surrounded competence frameworks for the health workforce, including pharmacists. Louie et al. (2004) and Tanner (2001) had argued that competency-based education was 'narrow', 'simplistic' and 'reductionist' and that significant aspects of learning, such as clinical judgment, clinical reasoning, empathy and interpersonal functioning, are not easily measured. Hence, despite the benefits of competency-based education over time-based education highlighted by Gruppen et al. (2012) especially in the LMIC context, competency-based education is often viewed as another "X-based" system of education that may not fix education issues in required contexts.

Problem-based learning (PBL) is another widely used technique that has been described to improve students' analytical, critical thinking skills and clinical

reasoning. PBL uses clinical cases as the context for students to study basic and clinical sciences. Possible advantages over traditional approaches include greater relevance to practice, ability to promote retention and application of knowledge, and encouragement of self-directed life-long learning (Johnson and Finucane, 2000). Following Frenk et al's (2010) seminal report there has been a move from problem-based learning to systems based instructional innovations to improve the performance of health systems by adapting core professional competencies to specific contexts, while drawing on global knowledge which this study has attempted. This should be the basis for pedagogical strategies chosen and these strategies should be flexible to pre-existing and future needs of the community (Duncan-Hewitt, 2005) as well as considering available resources, concerns and priorities (FIP, 2013), in order to optimize effectiveness.

Hence, the study theory of needs-based or fit-for-purpose education. It is however important to state that the term "needs-based education" as used in the context of this research does not refer to an X-based system of education attempting to fix education issues by an improved technique, rather an umbrella term covering several theories of development . It simply focuses on collaboratively finding what works for a particular social system. The global concession towards needs based education speaks to specific country needs and disabuses the "one size fits all" system that many LMICs have accepted. In contrast to a few other X-based education strategies, needs-based education is context specific and allows for a careful consideration of intrinsic and extrinsic factors while developing a system that works. It posits that investment in the planned, purposive training and education of the workforce is the key to achieving economic growth through fit for purpose human development (Ul Haq, 1995).

Bolman and Deal (1984) advocated that a multidimensional understanding of institutional needs, challenges and context are necessary to devise appropriate actions that lead to change, which is a multifaceted process involving stakeholders including educators and students (Katajavuori et al., 2017). The needs-based/ fitness-for-purpose study theory informed stakeholder engagement as well as the systems approach to this study.

1.3.1 Quality as Fitness-for-Purpose

In the higher education context, quality is defined in several ways: excellence, perfection or zero errors, ability to meet minimum standards, value for money, fitness-for-purpose (Fry et al., 2003; Harvey and Knight, 1996). The fitness-for-purpose approach to quality has been widely adopted by education policy makers and analysts (Houston, 2008) because fitness-for-purpose equates quality with the fulfilment of a specification or stated outcomes, it is a measure of whether or not a unit meets quality as against its intended goals (Campbell and Rosynai, 2002). How these goals are set are often culturally

determined, e.g. higher education systems based on the US model embrace variability across institutions while the British model aims to minimize or totally eradicate variability (Woodhouse, 1999).

The fitness-for purpose concept derives from the manufacturing industry that assesses a product against its stated purpose (Harvey, 2004). Moving on from previous definitions of product quality as one with no defects (zero defect product), fitness-for-purpose has quickly become the new definition, since quality only has meaning in relation to fulfilment of purpose. It is the new way to harness the drive for perfection. While the zero-defect product may be "perfect", if it does not fit its purpose, its perfection is irrelevant, and it is perfectly useless (Harvey, 2004). Though this may seem quite straightforward to grasp, it is a tricky concept nonetheless, as issues such as who determines purpose, and how fitness is assessed need to be answered (Fry et al., 2003). There are two broad answers to the question of who determines purpose: the 'customer' and the 'provider'. In the context of pharmacy workforce development, purpose can be defined by education providers, by patients, by students, by the government, by regulatory and accrediting agencies. It is not as clear-cut considering the complexities of interlinked higher education environments and varying expectations (Houston, 2008). How these decisions are made, and by whom, have been explored in this research. This has been done considering the global consensus that the training of pharmacists must be tailored to meet societal health needs, professional needs, identification of concerns and priorities, and coordination of appropriate supports through an efficient use of resources. This is therefore the definition of fitness-for-purpose of pharmacy education in the global context. Here, purpose is determined by the healthcare needs of patients and roles pharmacists are required to perform. This also reveals the purpose of pharmacy education as preparation to meet societal healthcare needs amidst several other views of education such as a tool for social justice, a way to grow the economy and nurture culture, or fit into the global market, or as preparation for adult life. Understanding this purpose would be crucial for decisions on how to design the curriculum to train needs-based pharmacists, and realistically admit the limits of education: what the curriculum can or cannot do.

Needs-based education is a strategy that calls for a system to assess the needs of its community and then develop or adapt the supporting educational system accordingly (Anderson et al., 2009). Adjusting core professional competencies in particular contexts while drawing on global knowledge and perspectives (Frenk et al., 2010; WHO, 2011). It is the global standard for pharmacy education and complies with the fitness-for-purpose theory. It ensures that practice and science are evidence based and pharmacists have the capabilities to provide healthcare services for their communities. Anderson et al. (2010) recommend that optimal educational systems development should progress through a Needs-Services-Competencies-

Education cycle (See Figure 1.6). Workforce development needs must be assessed and understood, after which services required to meet identified needs are defined. Then required workforce competencies to enable optimal quality in the delivery of these services are determined. Finally, educational programmes are designed to prepare a workforce that achieves, maintains, and enhances desired competencies (Zeitoun, 2011). This is the theoretical framework for my research.

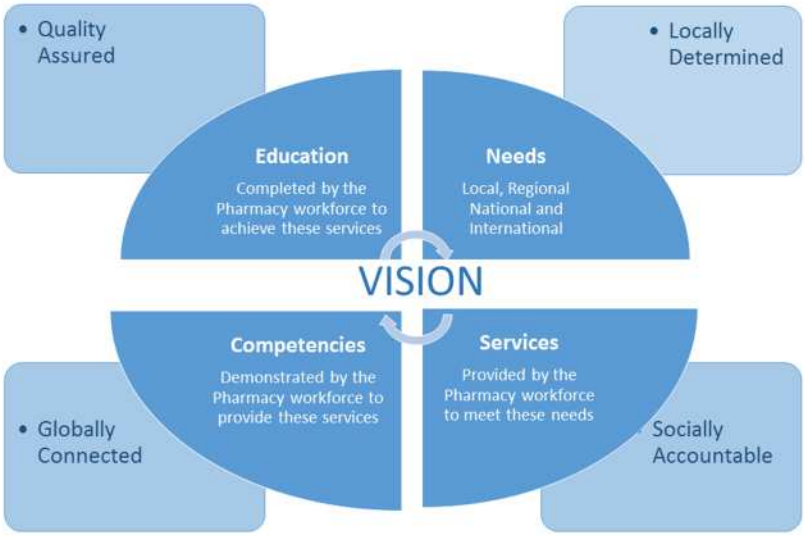

Figure 1.6: The needs-services-competencies-education cycle (Anderson et al., 2010)

Needs should always be defined and legitimized. In the context of this study, it refers to the gap between what exists and what is expected or required and has been identified by stakeholder responses to interview and survey questions. Harvey (2004) argues against some variants of fitness-for-purpose which state that resources should be allocated toward achieving purpose and not squandered on trying to achieve a higher standard product than is necessary. This seems to suggest that anything is acceptable if 'purpose' or 'need' can be contrived for it. This should not be so, hence" fitness-of-purpose" becomes a necessity. This evaluates whether the quality related intentions of an institution are adequate. This research explored fitness of stakeholder perceived purpose from responses as well by identifying standards applied during discussions around education status and quality and comparing these to global standards in chapter 6. By complementing "fitness-for-purpose" with "fitness-of-purpose" an evaluation can consider and challenge the comprehensiveness and relevance of purposes in order to ensure improvement. So that education is not given just for the sake of it but designed in such a way that it fulfils its purpose. Actualizing the fit-for-purpose theory in this way may also address skill mix imbalance.

Taking into consideration how purpose (workforce development needs) may change over time, the 'fitness-for-purpose' theory is developmental in nature and recognises that constant revision and re-evaluation of the specifications are both necessary to keep up with new and evolving contexts (Burrows et al., 1992). This was the argument on which the ground-breaking report of the Lancet commission on education for health professionals in the 21st century was based (Frenk et al., 2010), seeking to advance healthcare by recommending institutional and instructional changes that would produce professionals who are prepared to meet both current and future challenges in the ever changing healthcare landscape. This is especially true for the pharmacy profession which is constantly evolving (Anderson et al., 2010; Breland, 2007; Steyer et al., 2004). As a result, pharmacy education must be flexible, preparing pharmacists for these evolving roles while maintaining professional standards.

1.3.2 Stakeholder Engagement

The standard definition of 'stakeholder' as an individual or a group of people who can affect or can be affected by the achievement of an organization's aims (Freeman, 1984) has been used in this study. Stakeholders are described as useful contributors to education reform by their ability to identify needs, concerns and priorities in a particular context, thereby serving as credible experts (Creswell, 2003). Their importance in strategic discussions around education research is well-documented in literature (WHO, 2006; WHO, 2008; UN, 2016; Jamshed et al., 2007; Ghilzai, 2008). Implementing a needs-based approach requires ongoing consultation, co-operative partnerships, strategic, thoughtful and objective engagement, between all relevant stakeholders within countries and institutions in order to articulate, pursue, and achieve a profession-wide consensus and vision (UN, 2016). These discussions should also consider all required resources and the implications of proposed changes (Anderson et al., 2012).

Stakeholder engagement is not without its drawbacks. Anderson et al. (2010) noted that there is often a lack of consensus in assessing the needs of communities as each stakeholder engaged in the process has a different perspective. This was sometimes the case in this study. Some stakeholders confuse and even subvert local needs with their own "wants". Challenges notwithstanding, stakeholder engagement has been recommended while working towards a fit-for-purpose health education programme or undertaking other health projects of national impact (WHO, 2006), and the Kampala declaration and agenda for global action in 2008 clearly called for multi-stakeholder action to address workforce issues (WHO, 2008b). Stakeholders included in this study are shown in figure 1.7 below.

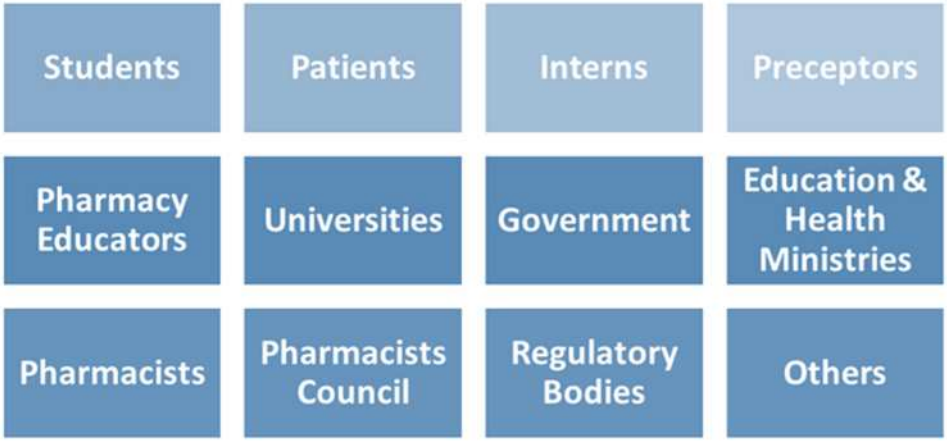

Figure 1.7: Stakeholders included in this study

1.4 Research Context: Nigeria

Without country specific studies, interventions may remain theoretical. They are useful to illustrate how complex processes can be broken down in a local context. Singly or in aggregation, they can also inform global development efforts. While each country is unique, findings can provide insights into how the needs-based model can be integrated into traditional academic environments especially for those not readily accepting of this notion (Anderson et al., 2012). It is important to state here that this research was initially intended to be an analysis of the recently approved PharmD undergraduate programme in Nigeria, to determine its feasibility in and suitability (fitness-for-purpose) for the Nigerian context. Engagement with stakeholders led to a broader study involving an analysis of the current status of pharmacy education, the subtleties and complexities surrounding the PharmD switch, domains for needs-based education in the Nigerian context as well as the previously planned analysis of the programme in light of revealed domains.

1.4.1 Country Profile

This research was conducted in Nigeria, which is the most populous country in Africa, and the seventh most populous country in the world with a population of about 204 million in 2020 (Worldometer, 2020), and ample natural resources. It is located in West Africa (Awaisu et al., 2016). It has 36 states and a federal capital territory clustered into six geopolitical zones (see figure 1.8): North-East, North-Central, North-West, South-East, South-South, and South-West, created for better governance being a highly populous country. Economic, political and educational resources are often shared across the zones. States with similar ethnic groups and common political history are grouped together within the same zone (Fathelrahman et al., 2016).

Despite Nigeria being a major oil and gas producer, ironically, most Nigerians live below the poverty line of one dollar per day (Okoroma, 2006). In the past

few decades, military rule as well as corruption and misappropriation of funds has negatively impacted economic growth, health, and education sectors. This is reflected by the country's per capita government expenditure on health being one of the lowest in the world (WHO, 2019). A major contributory factor to the poor health status is the health workforce skills gap earlier described, and a notion that western standards, despite being ill-suited to the Nigerian context, are better. This understanding of pharmacy workforce development in Nigeria while being important to Nigerians, may also be useful to other countries that require pharmaceutical workforce from Nigeria (Ogaji and Ojabo, 2014) or seek to understand the LMIC context.

Access to proper healthcare and essential medicines, which is a component of the right to health and an indicator of Nigeria's progress as a country is still lacking, and worse in rural areas and northern region where there are even fewer pharmacists (Chankova et al., 2006; Pharmanewsonline, 2016) and reflected in the number of pharmacy schools (see table 1.1). Nigeria offers the typical LMIC scenario of a growing population fraught with challenges, disease trends and economic distress where formal local-level decentralized structures exist by name rather than working for voice and accountability.

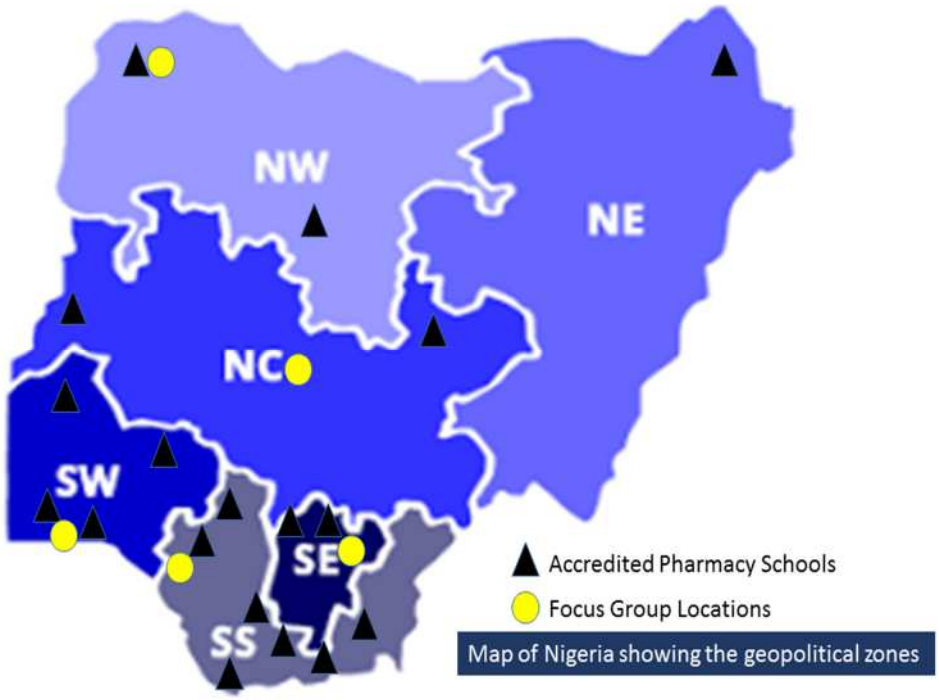

Figure 1.8: The map of Nigeria showing geopolitical zones, pharmacy schools and focus group locations (Key NE-North East, NC- North Central, NW- North West, SE- South East, SS- South South, and SW- South West).

1.4.2 Health System

Healthcare in Nigeria was originally based on traditional practice and herbal medicines; practitioners learnt through apprenticeship (Ityavyar, 1987). The

advent of western medicine as well as subsequent association of traditional medicine with witchcraft and satanism by missionaries, firmly established western medicine in most areas of the country. Western medicine and standards have been the accepted norm for health professional training and practice, after which the government equipped hospitals with resources and personnel, subsidized health costs and sponsored the training of medical personnel abroad. However, practice standards were not sustained with the downturn of oil prices and an increase in corruption. Generally poor work conditions and remuneration led to the mass exodus of health professionals seeking better conditions of employment in other countries. At the same time, traditional medicine practice had waned as most practitioners died having no one else to pass the knowledge to (Asakitikpi, 2019). The gap created by the exodus of health professionals led to the proliferation of quacks and counterfeit medicines (Akinyandenu, 2013). Amidst user fees, counterfeit medicines, quacks in practice, the debilitating state of hospitals, and workforce skills gap there has been a massive outcry by citizens for a restructuring of the health system.

The failure of the National Drug Policy (FMOH, 2005) follows the pattern of definite but insufficient progress earlier described. There are several issues of public health significance and the health status of Nigeria is still below global expectations as indicated by WHO statistics (WHO, 2019).

The public sector has three levels of care in alignment with the three tiers of government. The federal government handles tertiary care through the federal ministry of health, state government coordinates secondary care through state ministries of health, and the local government is responsible for primary care (Asuzu, 2004). Though the three health system categories run simultaneously, autonomy of each tier of government has made allocation of resources and demarcation of responsibilities troublesome (Awaisu et al., 2016). The private sector also provides health services to Nigerian citizens. Facilities in this sector are believed to be better and services are often higher priced (Olukoshi, 1993) which a majority cannot afford with over 60% of Nigerians living below the poverty line (World Bank, 2017).

Healthcare financing is a major issue as government spend on healthcare is still one of the lowest globally (WHO, 2019). This reflects in poor infrastructure and healthcare facilities available, hence the social elite and financially comfortable seek health services in countries abroad. Healthcare is funded through several channels, government budgetary allocations, grants and loans, private sector contributions, and out of pocket expenses. The real cost of healthcare is still not known due to poor record keeping (Fathelrahman et al., 2016). There are several insurance options that provide alternative funding. However, healthcare for many Nigerians is funded out of pocket.

Other issues described earlier exist alongside complaints by employers of mismatched pharmacy graduate skills or insufficient training in specific sectors of practice such as industry. These are challenges that need to be addressed for there to be considerable progress within the Nigerian health system.

1.4.3 The Pharmacy Profession and Practice

Pharmacy as a profession has gained increased recognition and relevance to Nigerians within: Hospital pharmacy, Community practice (retail and wholesale), pharmaceutical manufacturing, academic practice, regulatory and administrative practice. In 2018, 13,457 pharmacists served over 200 million Nigerians, the majority worked in urban areas, leading to shortages and geographical maldistribution. Over 70% of pharmacists work in hospital and community practice (Ekpenyong et al., 2018) and provide clinical and primary care services to patients.

Within hospital practice, there are primary, secondary and tertiary healthcare pharmacies (Fathelrahman et al., 2016) and the scale of operations in each level determines the standards and type of service available. Most pharmacists work in tertiary hospitals where they complain of feeling 'overtrained' and underutilized considering the limited roles they perform. Predominant pharmacists' roles include compounding, procurement, dispensing, counselling and drug information. Pharmaceutical care services including rational use of medicines and adverse drug reporting have been implemented in some hospitals. Core clinical services such as total parenteral nutrition, intravenous admixture, therapeutic drug monitoring, and clinical ward rounds with other members of the healthcare team are uncommon. Specialized clinical services such as anticoagulation and heart failure clinics are almost non-existent (Awaisu et al., 2016). Doctors' resistance to patient-oriented pharmaceutical services is a major reason among others such as inefficient co-ordination of activities, and lack of pharmacist specialization in the hospital setting (Erah, 2011; Olurinola, 2003). With the approval of the PharmD which would provide better clinical training for pharmacists, it is expected that pharmacists may be able to make more meaningful contribution to the health team. Working collaboratively with other health professionals may reveal areas where pharmacy expertise is needed for best patient outcomes (Erah, 2011).

Community pharmacy is often the first port of call for health services in Nigeria (Ekpenyong et al., 2018). Hence pharmacists are often required to provide primary care to patients which they may feel undertrained and unprepared for. In the community, pharmacists serve as gatekeepers by managing minor ailments and referring clients to hospitals when necessary (Matowe, Duweijua and Norris, 2004). These pharmacies are few and located mostly in urban areas: about 50% of the community pharmacies in the

country are located in just one city, Lagos, the commercial hub of the country. In which case clients are often underserved by over worked pharmacists and less qualified pharmacy assistants. The usual pharmacist roles include filling prescriptions, logistics and supply chain management, patient counselling and education and in some cases, personnel management. The shortage of pharmacists, especially in rural areas has necessitated the licensing of patent medicine vendors to sell non-proprietary medicines (Fathelrahman et al., 2016) to improve access to medicines. Unwholesome practices such as covert sales of prescription medicines and narcotics, wide distribution and sale of fake and substandard medicines, illegal importation and manufacturing have been reported among these vendors. In an effort to curb these practices, the Pharmacists Council of Nigeria (PCN) now stipulates that licensed pharmacy technicians should operate these patent medicine stores. Amidst these challenges the roles of community pharmacies have evolved. The concept of pharmaceutical care has been adopted by this practice sector and in addition to the traditional dispensing roles, clinical services such as wellness promotion, preventive care, vital signs and support for self-care are now offered (Ogaji and Ojabo, 2014).

The manufacturing sector is one of the major sectors of practice in Nigeria focused on drug production, distribution, quality control and assurance, research and development. Population demands for medicines far outstrips the national capacity for manufacture. In the same vein, required skills for industrial practice are more advanced than skills acquired by pharmacists in training. Despite an annual turnover of about 2.5 billion USD within the manufacturing sector, only about 35% of medicines needs of Nigerians have been met so far (Fathelrahman et al., 2016), highlighting a need for increased local production of medicines and raw materials. Research and development of new medicines is also grossly underdeveloped; poor research funding in the public sector and very scarce research grants in the private sector coupled with erratic power supply and other socioeconomic challenges have stagnated this sector. An enabling environment should be created for the manufacturing sector to be able to meet the medicine needs of the Nigerian population. Efforts should also focus on ensuring that the sector complies with global standards. Earlier mentioned challenges such as power, training deficits, and availability of grants need to be addressed. Also, medicines imported to make up shortfalls must be of standard quality.

1.4.4 Practice Regulation

Regulations in Nigeria are neither adhered to nor strictly enforced. For example, the law stipulates that prescription only medicines (POMs) can only be sold in registered pharmacies and dispensed against a valid prescription, yet poor enforcement, means that patients can buy them without a prescription, and at stalls of street vendors at night (Awaisu et al., 2016). According to the law, all imported drugs (except orphan drugs which require

only a permit) must be registered with NAFDAC and the business premises approved by the PCN (Mora, 2014), but this is not so in reality, as there are unregistered drugs being sold.

Despite efforts of regulatory agencies, the chaotic drug distribution system continuously threatens the healthcare system and puts public health at risk (Fathelrahman et al., 2016). Widespread corruption for monetary gains exists (Erah, 2011; Olurinola, 2003). with more than 30% of medicines being sold contained wrong, low or no drug content as claimed on the label (WHO, 2008). This is one of the major public health challenges in Nigeria, often leading to irrational use of drugs (See figure 1.9)

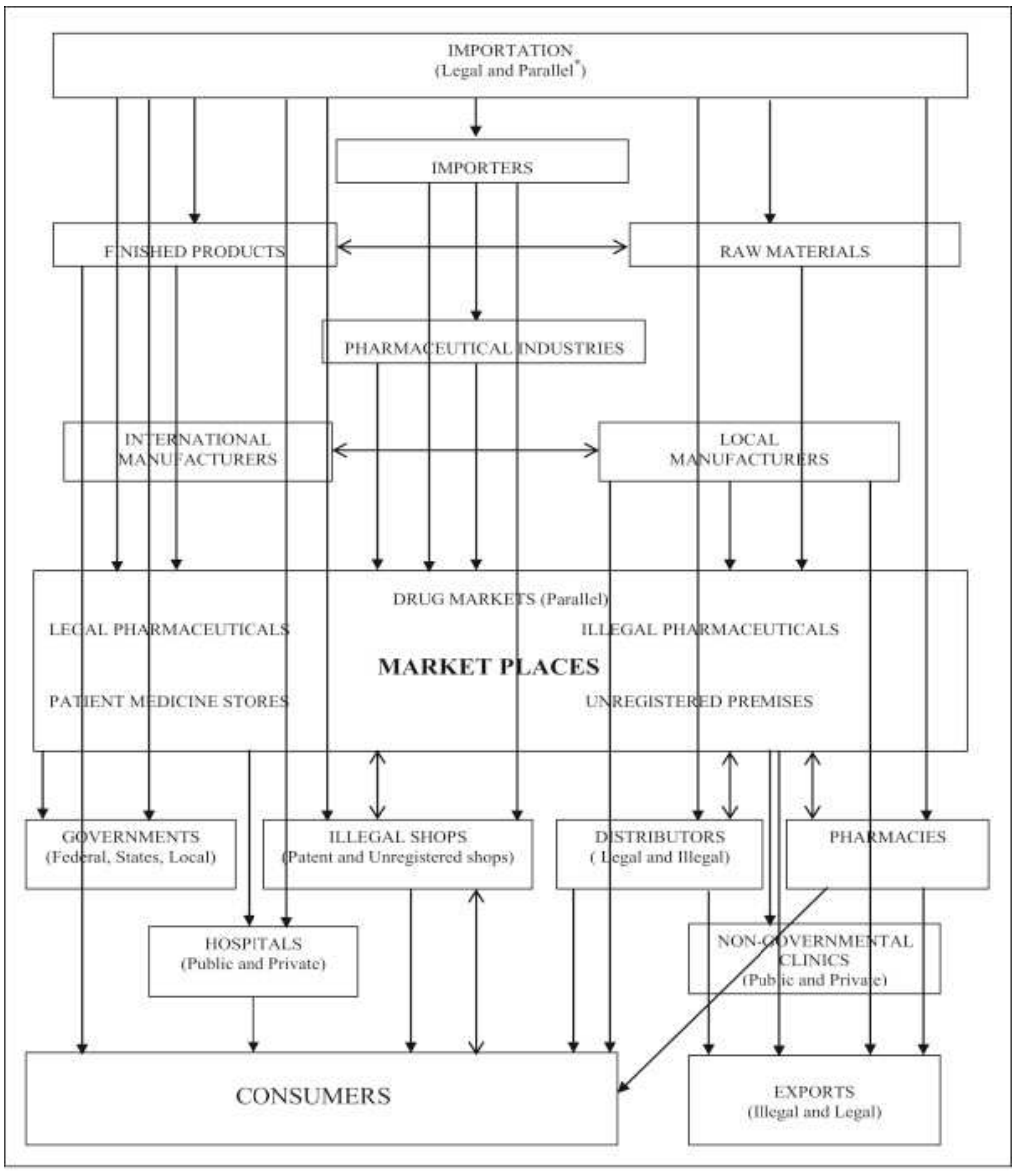

Figure 1.9: Schematic view of a chaotic drug distribution pattern in Nigeria (Awaisu et al., 2016)

In response to this, the government proposed channels for drug distribution are shown in figure 1.10 below.

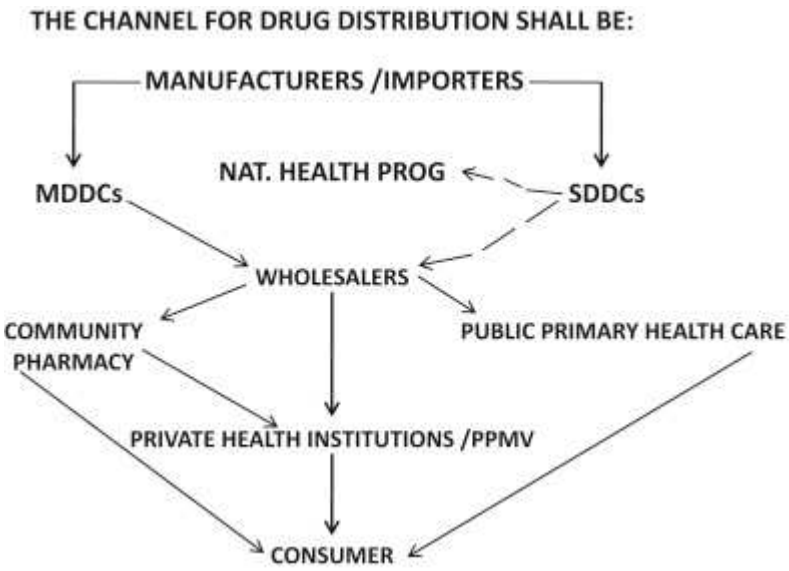

Figure 1.10: National drug distribution guidelines' drug distribution channel (FMoH)

Other challenges including transportation of medicines and poor storage conditions contribute to the loss of potency before getting to the end users. Initiatives such as regular inspection, sample testing and mobile authentication to guarantee quality of antimalarials and antibiotics has yielded some results.

There are also no stringent regulations on medicines pricing, hence a wide variability in prices of the same medicine exists across facilities; medicines in Nigeria cost between 2 to 64 times as much as international reference prices (FMOH, WHO, EU, HAI, 2006). In response to this, the national drug policy was revised in 2005.

1.4.5 Pharmacy Education in Nigeria

Globally, giant strides have been made within the health training institutional landscape. Examples of reforms include a scientific approach to medical education in the USA (Flexner, 1910), the demand for training of field workers for public health campaigns in many countries (Welch-Rose, 1915), an overhaul of India's Health training institutions following Bhore's report in (1946), China's barefoot doctors (Chang, 1966). Several studies also report the development of pharmacy education across countries (Austin, 2008; Kheir et al., 2008; Bourdon et al., 2008; Marriot et al.,2008; Sosabowski and Gard, 2008; Ryan et al., 2008) as well as changes to prepare pharmacists for evolving roles while maintaining global and local standards. There are concerns however that similar steps forward have not been recorded in

several LMICs, and with new challenges arising in the 21st century, the higher education landscape is neither responding to current needs nor preparing for what lies ahead (WHO, 2006).

Pharmacy is offered at the higher education level of study in Nigeria. The higher education sector in Nigeria is made up of 170 universities: 91 public (43 federal, 48 state) and 79 private universities accredited by the NUC. 18 universities: 12 federal, 4 state and 2 private universities are accredited for training of pharmacists. See table 1.1 below. Schools of pharmacy are known as faculty of either pharmacy or pharmaceutical sciences depending on emphasis placed on the training. This nomenclature previously determined schools' core courses, and the time allotted to teaching (Ogaji and Ojabo, 2014). While the nomenclature remains, there is now a unified benchmark-BMAS for pharmacy programmes, developed by the National Universities Commission, and focused on patient-centred care (See Appendix 1).

FIP defined pharmacy education as the educational design and capacity to develop the workforce for a diversity of settings across varying levels of service provision and competence (Anderson et al., 2009). The education of pharmacists in Nigeria began by a desire to meet needs; dispensers were trained to help doctors "mix drugs". Institutionalized pharmacy and pharmaceutical sciences education in Nigeria began in the early 1920's with the training of chemists and druggists at the school of Pharmacy, Yaba. Several other pharmacy schools were established afterwards, and now there is an average of about 1300 graduates annually (Ekpenyong et al., 2018). By 1980, Nigeria had established a well-regarded higher-education system offering instruction at an international standard in a number of areas. However, this reputation steadily declined under successive military governments (Saint, Hartnett and Strassner, 2003). Between 1990 and 1997, for example, the real value of government allocations for higher education declined by 27% as enrolments grew by 79%. Resulting in dramatic fall in the quality of university education and research, as implied by the 62% drop in the real value of recurrent expenditure per student during this period (Hartnett, 2000). Downward pressure on salaries, deteriorating working conditions, and political repression on campus, generated staff and student strikes during the 1990s, and culminated in year-long closures of the university system in 1992 and 1996 (Oni, 2000), and again in 2002.

In Nigeria, only 4% of the relevant age cohort are enrolled in university, comparing poorly with economic competitors such as South Africa (17%), India (7%), Indonesia (11%), and Brazil (12%) (Taskforce on Higher Education and Society, 2000). In the post-colonial era, higher education was viewed as a luxury in sub-Saharan Africa having lower returns than basic education (Psacharopoulos, 1981). Since then, combined challenges of academic brain drain (Levy, 2003), underfunding (Akinyemi, 2013), embezzlement of funds

(Ololube, 2016), industrial action (Adavbiele, 2015), inequity, poor governance have almost paralysed this sector. Today, old challenges have been augmented by new ones of rapid changes in ICT and the globalization of trade and labour markets (Salmi, 2001) as well as westernization leading to a skill mix imbalance.

Many LMICs including Nigeria have neither articulated a development strategy linking knowledge to economic growth nor built up their capacity to do so. Although its Africa's largest country with 20% of the region's population, Nigeria had only 15 scientists and engineers engaged in research and development per million persons in 2002, compared with 168 in Brazil, 459 in China, 158 in India, and 4,103 in the US (World Bank, 2002). This may be responsible for the low level of development, poor economic growth, weak institutions as revealed by Oketch, Mc Cowan and Schendel (2014).

Table 1.1: List of accredited pharmacy schools in Nigeria

GEOPOLITICAL ZONES	LIST OF ACCREDITED PHARMACY SCHOOLS	YEAR ESTABLISHED
NORTH EAST	Faculty of Pharmacy, University of Maiduguri, Maiduguri, Borno State	2001
NORTH CENTRAL	Faculty of Pharmaceutical Sciences, University of Jos, Jos, Plateau State	1982
	Faculty of Pharmaceutical Sciences, University of Ilorin, Ilorin, Kwara State	2010
NORTH WEST	Faculty of Pharmaceutical Sciences, Ahmadu Bello University, Zaria, Kaduna State	1968
	Faculty of Pharmaceutical Sciences, Usmanu Danfodiyo University, Sokoto, Sokoto State.	2007
SOUTH EAST	Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka, Enugu State	1970
	Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Awka, Anambra State	2007
SOUTH SOUTH	Faculty of Pharmacy, University of Uyo, Uyo, Akwa Ibom State	1990
	Faculty of Pharmacy, University of Benin, Benin City, Edo State	1970
	Faculty of Pharmacy, Igbinedion University, Okada, Edo State*	2004
	Faculty of Pharmaceutical Sciences, University of Port Harcourt, Port Harcourt, Rivers State.	2005
	Faculty of Pharmacy, Madonna University, Elele, Rivers State*	2003
	Faculty of Pharmacy, Delta State University, Abraka, Delta State.	2005
	Faculty of Pharmacy, Niger Delta University, Wilberforce Island, Bayelsa State	2002
SOUTH WEST	Faculty of Pharmacy, University of Ibadan, Ibadan, Oyo State	1980
	Faculty of Pharmacy, University of Lagos, Lagos, Lagos State	1980
	Faculty of Pharmacy, Obafemi Awolowo University, Ile-Ife, Osun State	1962
	Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu, Ogun State	1998

*-

Private Universities

1.4.6 Education Regulation

Global education standards have been set by FIP such as the Global Competency Framework (FIP, 2012) the Pharmaceutical Workforce Development Goals (FIP, 2016) and the Nanjing Statements (FIP, 2017). However, how these global standards are perceived and locally appropriated in Nigeria as well as what constitutes local standard requirements are defined by the National Universities Commission (NUC) and Pharmacists Council of Nigeria (PCN) benchmarks.

Pharmacy education in Nigeria is regulated by both ministries of education and health. NUC, is parastatal under the Ministry of education responsible for quality assurance and accreditation of all programmes. There are variations in the way accreditation is conducted globally: in some countries it is conducted by professional organizations, in others by the government (Uys and Coetzee, 2012). In Nigeria, it is conducted by both, independently. Four domains are evaluated: academic matters, physical facilities, library, and staffing and these include learning infrastructure, staff numbers and qualification, student assessments, among others. There is limited literature on the impact of accreditation on quality improvement, but it has served as a guide for education to address the priority needs of the community (WHO, 2013) and is recommended for pharmacy workforce development globally (FIP, 2017) though it exists in only a third of African countries (Frenk et al., 2010). In the Nigerian context, accreditation has neither produced the curricular harmonization intended nor assured quality according to stakeholders in the qualitative research phase. PCN is the professional regulatory body. Its philosophy is to produce a well-educated and competent professional pharmacist in every Institution. PCN ensures quality standards are attained and maintained by conducting periodic accreditation exercises independently of the NUC, induction programmes for graduates, Pre-registration Examinations for Pharmacists (PEP), Foreign Pharmacists Graduate Orientation Programme (FPGOP) and Mandatory Continuing education for Professional Development (MCPD) of practising pharmacists (PCN, 2016).

Most pharmacy education challenges, such as curricular overload, mismatch between acquired and required skills for practice and wide variation in graduate competence among others, are attributed to poor regulation.

1.4.7 The Pharmacy Undergraduate Programmes

The benchmark minimum academic standards (BMAS) was designed, with these goals in view, for the education and training of undergraduate students wishing to obtain pharmacy degrees within the university system. It stipulates the minimum requirements for design of pharmacy degrees. According to the BMAS, the mission of Nigerian pharmacy education is to produce pharmacists worthy in character, capable of critical thinking, lifelong learning and knowledgeable in the practice of pharmacy towards the achievement of

optimal patient outcomes. This in line with global recommendations. However, the Nigerian BPharm curriculum has been described as a pseudo British-American curriculum that does not address local needs and peculiarities (Ikhile and Chijioke-Nwauche, 2016). Hence, the clamour for a new programme. Currently, there are two undergraduate pharmacy programmes being run in Nigeria, The Bachelor of Pharmacy (BPharm) and Doctor of Pharmacy (PharmD) programmes.

1.4.7.1 The Bachelor of Pharmacy (BPharm)

The current pharmacy programme is the 5-year BPharm (4 years for direct entry). Each year comprises two 15-week semesters. The entry requirement is a minimum of credit pass in five relevant subjects (including Mathematics and English) in not more than two attempts at the General Certificate Examination Ordinary level examinations administered by the West African Examination Council or the National Examination Council. In addition to a score above the set mark for specific courses in the Unified Tertiary Matriculation Examination (UTME), or direct entry. It is a declassified degree programme with a 50% pass mark and a cumulative grade point equivalent to a second-class lower being the minimum requirement for graduation (Ikhile and Chijioke-Nwauche, 2016). Despite the harmonized BMAS, curricula content varies across schools; common courses include pharmaceutics, pharmacognosy, medicinal chemistry, pharmacology, clinical pharmacy and pharmacy practice (Fathelrahman et al., 2016).

Graduates are expected to function knowledgeably, confidently and consistently as healthcare providers, while maintaining ethical standards of practice. Expected competencies include the ability to: source appropriate drug material, prepare the drug in a form suitable for administration, ensure the quality of the final product, distribute drug products to consumers appropriately, prevent misuse and harmful effects, give appropriate professional information at various points of care, organize and promote pharmaceutical care in patients.

The Student Industrial Work experience scheme (SIWES) is another component of student learning mandated by NUC where students spend a 6-month period in the third or fourth year of study working in an industry related to their discipline to consolidate classroom knowledge and develop transferable skills.

At the end of this programme, graduates must complete a mandatory one-year paid internship training at accredited centres (Ikhile and Chijioke-Nwauche, 2016), pass the pre-registration examination for pharmacists (PEP), after which they can apply to PCN for full registration as a pharmacist. The licence to practice must be renewed annually and fitness to practice maintained by undertaking the three-year cycle mandatory continuing professional development (MCPD).

1.4.7.2 The Doctor of Pharmacy (PharmD)

Following intense agitation for the approval of the PharmD curriculum by pharmacy stakeholders in Nigeria, the 6-year Doctor of Pharmacy programme was approved by NUC in July 2016 as the minimum requirement for all pharmacy practice (Ikhile and Chijioke-Nwauche, 2016). The PharmD is a clinically- intensive programme which trains students to respond to immediate community as well as contemporary global needs of a patient-oriented pharmaceutical healthcare delivery system. Graduates are expected to have enhanced pharmaceutical knowledge and professional skills to competently identify and solve both human and veterinary drug-related problems.

Some see this change as long overdue owing to the global clinical focus of pharmacy practice in recent times insisting that in other countries like the United Kingdom, Qatar and Saudi Arabia, pharmacists are directly involved in patient care, offering invaluable services as experts and key members of the health team (pharmanewsonline, 2016). Others see the development as unnecessary and superficial because in some countries the PharmD merely extended the programme duration by one year with no content change (Jamshed et al., 2007), with no recorded clinical practice improvement in LMICs that have made this change (Babar et al., 2013).

The PharmD switch refers to a change in the pharmacy undergraduate program from the Bachelor or Master of Pharmacy (BPharm or MPharm) to the clinically intensive Doctor of Pharmacy (PharmD) as the entry level degree for pharmacy practice. This transition began in the USA due to systemic and conceptual changes in pharmacy practice leading to a focus on direct patient care (Miller, 1981) and has spread to several LMICs (Frankel, 2014; Yoo et al., 2014). The PharmD is currently being embraced in countries like Ghana, South Africa (Jamshed et al., 2007, Summers et al., 2001), while Kenya lags behind in the implementation of this (Okumu et al., 2017). Rhetorical debates about the motivation for, suitability, and feasibility of the PharmD in the LMIC context have appeared in pharmacy education literature over many years (Anderson and Futter, 2009; Deshpande, 2013; Jamshed et al., 2009; Jamshed, Babar and Masood, 2007; Babar et al., 2013) but little empirical research has been conducted to determine the actual motivation for the switch.

Also since the pharmacist's clinical role in Nigeria is not established, this may result in a complete shift in attention from the traditional concept of pharmacy training which focuses on drug research, quality control, and manufacturing, and a major vacuum would be created when pharmacists abdicate this equally important role for the Doctor title. The controversy caused by recent changes has become an opportunity for me to research education suitable for pharmacy practice and profession in Nigeria, while remaining globally relevant, progressive, and prepared for the future. And at

the same time uncover the motivators for as well as barriers and facilitators to this switch. These have been discussed in chapter 5.

1.5 Research Questions, Aims and Objectives

My research questions reflect the problem I would like to investigate. They are extensions of the statement of purpose for the study (Johnson and Christensen, 2004), determine the study focus, as well as the boundaries, and inform the type of data collected. Four research questions for this project include:

- What is the **current status of pharmacy workforce development** in Nigeria?
- What are **pharmacist perceived domains that determine fit-for-purpose pharmacy workforce development** in Nigeria?
- What are the **barriers** and **facilitators** to n**eeds-based workforce development** in the context of Nigerian pharmacy practice, and the extent of their influence?
- How does the **Nigerian Benchmark Minimum Academic Standards (BMAS)** reflect both **global recommendations** and **local requirements for workforce development**?

The overarching aim of the study was to explore fit-for-purpose pharmacy workforce development from a multi-stakeholder perspective with an intent to identify key drivers, barriers and facilitators in the LMIC context, with the expectation that this would inform and provide guidance for ongoing policy and governance efforts around undergraduate pharmacy education in the Nigerian context. This would also provide evidence-based data for addressing skill-mix imbalance in the Nigerian context and indeed any LMIC context with similar circumstances. The objective of the qualitative phase of the study was to explore the "education fitness-for-purpose" phenomenon from stakeholder perspectives and to develop an instrument grounded in these views for the quantitative phase. The objective of the quantitative phase was to describe the sample and determine if qualitative opinions were nationally perceived. Findings from both were useful for establishing local standards in the subsequent documentary analysis of the curriculum.

1.6 Thesis Structure and Organization

This research is located within wider global health and workforce inequity issues caused chiefly by both 'quantity' and 'quality' challenges. It focuses on quality challenges and on the pharmacist as an essential primary health provider in the LMIC context. It explores key domains for sustainable workforce development which could possibly address workforce quality challenges identified. Engaging with a multisectoral, multicultural selection of key stakeholders ensured a wider perspective on strategies to boost the

efficiency of existing human resources. This study has been undertaken with a systems approach as recommended by Frenk et al (2010), considering connections between education and the health system, and is in line with the WHO call for concerted and immediate efforts to transform and scale up health professionals' education and training (WHO, 2013): identifying major gaps, and country-specific priority areas as foci for change. The argument for this is that adopting a systems approach is holistic and likely to bring about sustainable change. In the same way, involving stakeholders will likely lead to shared ownership for decisions and create a platform for collaborative partnerships. Generally, focusing on key areas identified may maximize efficiency and yield best results in a resource-limited setting. The expectation is that an improvement in health workforce quality (including relevance and sustainability) in these regions can strengthen the health systems and help to bridge the existent wide gap towards a greater possibility of achieving global health goals. This thesis has been structured thematically based on the objectives of the project (see figure 1.11 below).

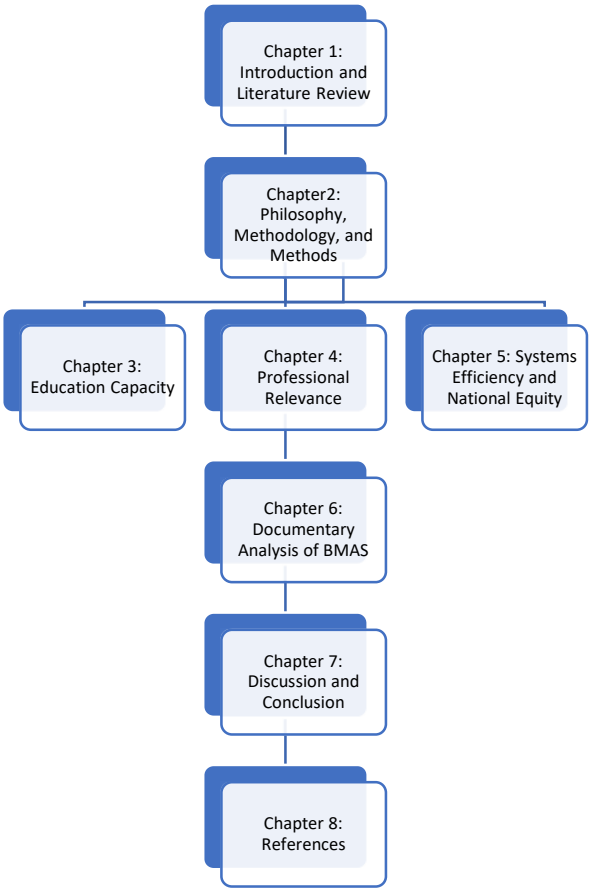

Figure 1.11: Thesis structure

2 Chapter 2: Philosophy, Research Design, Methodology and Methods

2.1 Introduction

In all research, philosophical assumptions and positioning which influence the researchers' worldview, either consciously or unconsciously determine research conduct (Parvaiz et al., 2016). Every instance of inquiry is situated within a particular context, every experience awakens prior beliefs, so that we are constantly acting within a mind-set that determines our choice of research question, methodology, and methods (Morgan, 2014). Observations are therefore theory dependent. Even schools of thought that acknowledge an independent reality admit that access to it is mediated (Bogen, 2017). This realization creates a need to show a logical flow from previously acknowledged philosophical positioning underpinning any research carried out to methodological choice.

2.2 Philosophical Underpinning

It has been agreed that with mixed methods research, rather than begin with philosophical foundations, the choice for mixing methods should be a pragmatic one driven by the questions that the research seeks to answer (Johnson and Onwuegbuzie, 2004). Pragmatism has a positive meaning to me, being practical in solving problems, getting things done in the best possible way while taking others' views into account, thereby leading to shared ownership for decisions made and results of implementation. I am interested in what works, using diverse approaches, and giving priority to my research question (Morgan, 2007).

2.2.1 Paradigm Incompatibility?

The idea of combining methods from paradigms may not sit well with purists. The conflict between two ways of thinking in the philosophy of science persists. It is a dilemma of sorts between paradigms that seems irresolvable.

Thomas Kuhn who popularized the term "paradigm" did not give a singular definition for the term and in fact has been accused of using it in over twenty ways (Morgan, 2007). However, for the purpose of this research it will mean worldviews, or a set of beliefs about the nature of reality, knowledge and values, and practices that guide a field. The paradigm incompatibility theory holds that the conflict between qualitative and quantitative research is so foundational that it is virtually impossible for them to be combined without violating philosophical principles (Morgan, 2014). Positivism and interpretivism are seen as two mutually exclusive paradigms about the nature and source of knowledge. The deductive reasoning that aims to confirm a well-established theory often associated with positivism seems in direct contrast with the inductive reasoning of interpretivism that aims to develop a theory (Parvaiz et al., 2016).

A brief explanation of both paradigms may be useful here, positivism is the most extreme form of a realist worldview- that what research does is uncover an existing reality. The truth is 'out there' and it is the job of a researcher to find it using objective research methods and being as detached as possible from the research. Positivists believe that the world works according to fixed laws of cause and effect (Mujis, 2010). Scientific thinking is used to test theories about these laws and either reject or provisionally accept them, and this is how we finally get to understand the truth about the way the world works. However, this view is problematic, or at best incomplete, we are all part of the world we are observing and cannot completely detach ourselves from it. Historically, research has shown that what is studied, and the findings produced, are influenced by the beliefs and views of the researcher (Mujis, 2010). The scientific method is both contingent and influenced by social and political forces (Freshwater and Avis, 2004), therefore the idea of objective knowledge is open to argument.

Subjectivists point to the role of human subjectivity in the process. They believe that the truth is not 'out there' to be objectively and dispassionately observed by us but is at least in part constructed by us and our observations and the process of our observing the truth changes and transforms it. Looking at the extreme forms of the two paradigms it would seem that the two research paradigms are in fact incompatible.

This perceived polarization had over time promoted purists who were unwilling or have refused to accept that epistemological purity popularized in time past no longer represents best practice. They restrict themselves to a single paradigm thereby relying on one type of data. Such single method research is the biggest threat to the advancement of social research. Purity of a research paradigm is a function of the extent to which a researcher is prepared to conform to its underlying assumptions. Hence discrepancies in the two paradigms do not originate from different goals but a decision to adopt different operational strategies to achieve these goals (Onwuegbuzie and Leech, 2005). Any experienced researcher would have come to discover that, in reality, the research designs are not so polarized, the dichotomy between the paradigms is false. All distinctions between methods in both paradigms lie on continua (Collis and Hussey, 2013). For example, as regards the manipulation of an independent variable, the continuum is from a situation where the researcher is the agent of change to one where he has no control over such changes. Also, hypotheses lie on a continuum from exploratory to confirmatory. Pragmatism encourages retroductive or abductive reasoning, seeking the most likely explanation for an observation where the premises don't guarantee the conclusion.

2.2.2 Pragmatism: Standard Views

According to a pragmatist, there are several different ways of interpreting the world and undertaking research. No single point of view can give the entire picture: induction being that there is no theory-independent language with which observations can be described, no amount of observations can establish a universal truth. And for deduction, almost any theory will suffice.

The research question is the most important determinant of the research philosophy employed, hence, both positivist and interpretivist methods can be employed within a single research study depending on the nature of the research question (Saunders et al., 2012). Rather than assign post-positivism and constructivism from the onset to different ontological and epistemological camps, a pragmatist would instead concentrate on their inherent approaches to inquiry (Morgan, 2014).

Therefore, pragmatic researchers are more likely to have a full repertoire of research skills and select methods based on their ability to best address the research questions rather than based on preconceived biases about which paradigm is hegemony in social research (Onwuegbuzie and Leech, 2005). Pragmatism favours a pluralism of positions based on what works as dictated by the research question(s). It sets aside concerns about how evidence represents the world and instead focuses on the arguments that account for the usefulness of evidence derived from various forms of enquiry (Rorty, 1999; Freshwater and Avis, 2004). Each form of enquiry must be considered in the light of its role in generating the evidence to justify knowledge claims.

The major debate between realism and anti-realism is rejected by a pragmatist. He/she replaces the arguments about the nature of reality as the differentiating factor for research approaches yet recognizes the importance of these different approaches as communities that guide the conduct of inquiry. All this is done without a dependence on metaphysical assumptions about ontology and epistemology. While post-positivists claim that the world exists independently from our knowledge of it, constructivists believe that the world is created by our conceptions of it (Morgan, 2014). Pragmatists do believe in a reality but in one that constantly changes based on our actions and decisions. Any attempt to find a lasting reality external to ourselves which Dewey (1930) termed “the spectator theory of knowledge”, is doomed to failure.

Pragmatism rejects relativism and believes instead that actions have quite predictable consequences, hence differs from interpretivism. To a pragmatist research is a human experience based on beliefs and actions of actual researchers rather than characterizing research in terms of ontology, epistemology and methodology. Considering that research never occurs in a vacuum, pragmatists are concerned about how external factors shape choices made and the interpretation of these choices (Morgan, 2014).

2.2.3 Why Pragmatism?

Pragmatism is a useful choice for my research because it fits what we do. Pharmacy education like most professional education sectors is outcomes oriented. Students are expected at the end of the course of study to possess knowledge, skills, and attitudes fit for practice. In pragmatism, issues are best resolved by comparing outcomes that result from different courses of action rather than appealing to a set of abstract principles (Ormerod, 2006). In this way, we can determine if stakeholders' qualitative responses are nationally perceived by comparing with quantitative data. Also, while stakeholders may not always agree on a set of principles they can agree on expected outcomes and hence the course of action to achieve same outcomes.

Pragmatism encourages a scientific, empirical and methodical approach to problem solving. The fitness-for-purpose theory and needs-based framework to ensure education relevance to practice are both methodical and the latter a product of scientific research by the International Pharmaceutical Federation education team.

Pragmatism highlights the incertitude and changeability of findings. They remain "truth" until proved otherwise. It agrees with the history of error and correcting error, it realizes that science is context dependent. This research disabuses the one-size-fit all approach to education and advocates an education program that is context specific employing social science methods, one that meets the needs of the immediate society, not the generic easily transferable, yet inapplicable system of education. And when this is achieved, its adequacy is tested by being employed in action in keeping with Dewey's (1930) theory. The needs-based approach is also iterative recognizing that human needs are not constant, they change over time.

Meaning is personal, as posited by William James, and no thought is justified by its correspondence with reality, if not what is the purpose of humans as intellectual beings? (Ormerod, 2006). Hence, a collaborative approach that involves intellectual discourse is encouraged so that every perspective is captured, and a richer and more diverse solution is reached. Involving stakeholders at every stage of the research aims to achieve this end, to encourage shared ownership for decisions made and maximize diversity. The mixed methods approach employed can also be supported by this idea. Knowledge and inquiry are both social, hence updating knowledge ought to be a collaborative endeavour.

The needs-based approach is based on experience, experimentation, and action as is pragmatism, encouraging socially accountable education and is focused on what works in a particular context. In which case what does not work is done away with. Important issues such as ethics, social interests, morality and politics are not ignored. In every society, power dynamics are present affecting research and education to a large extent. Pragmatism

embraces societal norms and values and realizes that these shape thoughts and the validation of ideas and the conduct and ethics of research.

Generally, in academia there is an emphasis on the development of theory, pragmatism acknowledges this and goes further to posit that the purpose of theory is to serve practice. It is difficult to see how there can be a higher purpose for new problem-solving methods than actually solving problems, thereby improving and aiding practice. Needs-based education discredits abstract pharmacy educational principles and pedagogies that do not translate to better pharmacy practice. It is not against theory or principles but it gives them a less prominent role, focusing instead on context suitability, outcome and consequences, on means as well as ends (Ormerod, 2006).

Pragmatism's position on many things is quite modern. Science as a social activity makes room for collaboration, hence interdisciplinarity, which is the future of social research. Pragmatism is a flexible philosophy, able to accommodate other philosophical positions. It starts with no particular results in mind, it has no doctrines or fixed ideas, except its methods. It is therefore in the best position to take advantage of the benefits to be derived from mixing methods based upon alternative paradigms (Ormerod, 2006).

Inquiry will always be a social, political, and value-determined undertaking which cannot be separated successfully from culture. Pragmatists advocate a freedom of inquiry, the liberty for researchers to go about research in ways that are most meaningful to them (Morgan, 2014). Hence favour "informed" agency over structure. Theories should be assessed based on their capacity to solve human problems. The mandate of science is to proffer solutions to real human problems and not to search for truth or reality, which is the root of the paradigm wars. This is the major critique of positivism and interpretivism, both are conservative with no concern for social inquiry to transform society. After all, of what use is a "reality" that does not facilitate human problem solving? Granted, accepting a pragmatic basis for social research will require a change in thinking, but the time has come to sidestep metaphysical issues and pursue real decisions that drive the practice of research (Morgan, 2014).

I realize that the philosophical arguments put forward by pragmatism may not be the best way to understand the world or humanity. Such surety, I believe, cannot be claimed by any philosophical position. We can only judge these positions as we put them to practice. Are they useful to us, do they make sense in practice? The answer for me has been yes, to pragmatism. Coincidentally, these are also pragmatic questions. All philosophies at the end are judged pragmatically in terms of adoption or use.

2.3 Mixed Methods Methodology (MMM)

Qualitative and quantitative approaches to research are informed by different theories of knowledge or epistemological stances (Given, 2008) as explained

above. As more researchers realize that the research question is an important determinant of the research philosophy employed, qualitative and quantitative data collection and analysis are integrated in a single study or research project to better answer their research question (Saunders et al., 2012). Over the past few decades mixed methods research is increasingly subscribed to by an emerging cross-disciplinary community of researchers and has emerged as a distinct methodological approach. It is now considered the de facto third methodological movement toward social science inquiry (Tashakkori and Teddlie, 2010).

The term 'mixed methods' has several different definitions (Johnson, Onwuegbuzie and Turner, 2007) but for the purpose of this project, it is defined as research where the researcher systematically collects, mixes or combines, analyses and integrates quantitative and qualitative research techniques, methods, approaches, concepts or language in a single study (Creswell, Fetters and Ivankova, 2004) in order to best answer the research questions. The historical origin of mixed methods research has been a matter of debate. While some suggest that it began with the ground-breaking Hawthorne studies of the 1930s which made use of empirical data, interviews and observations (Tashakkori and Teddlie, 2010), others argue that it dates back even earlier to the Thomas and Znaniecki study of polish peasants in the 1920s (Lewis et al., 2009). There have been varying degrees of comfort and acceptance also, while some struggle with accepting this methodology, it has coexisted comfortably for a while in applied fields like evaluation (Greene, 2007). In such fields, complex social issues are not amenable to rigid probes by researchers insisting on their epistemological stance, such complexity demands multiple investigative tools (Pierce, 2008). Mixed methods is not simply a matter of gathering quantitative and qualitative data, there are specific scientific techniques associated with this methodology which are discussed below.

The mixed methods approach has been viewed in several different ways; from a philosophical stance in which epistemology and other philosophical assumptions take centre stage, to a methodology originating from a broad philosophy and extending to interpretation and dissemination, and then to a method where data collection, analysis and interpretation are the crux. My perspective is to view 'mixed methods' as a methodology or approach to research originating from a broadly pragmatist stance and influencing my choice of methods.

As a pragmatic researcher, I adopted the approach of 'doing what works.' I used the theoretical and methodological differences among the interview, survey, and documentary analysis methods to generate more insights than would have been possible with either method alone (Greene and Caracelli, 1997). Qualitative methods were used to explore stakeholders' perspectives

on fit-for-purpose pharmacy education in Nigeria, and themes were used to determine priority items for a quantitative instrument grounded in their views, after which these views (representing local standards) and global standards were utilized for documentary analysis of the Nigerian pharmacy curriculum. Figure 2.1 below shows the phases in the research process.

Figure 2.1: Phases in the research process

2.3.1 Why Mixed Methods?

Its central premise is that the combination of quantitative and qualitative approaches provides a better understanding of the research problem than either approach alone (Creswell and Plano Clark, 2011). With the broadening scope of research questions and to thoroughly understand a complex phenomenon such as education fitness-for-purpose, the explanatory power of qualitative research, as well as an optimized sample size with a large number of participants may be needed in the same study (Collins et al., 2006). In education policy-related research, most stakeholders are no longer content to accept globally recommended evidence-based interventions, but also need to understand how they will work within a particular context, how best to implement them considering attendant as well as potential barriers and facilitators, and possibly subsequent programme evaluations (O'Cathain and Thomas, 2007). Hence, there is often a need to employ both quantitative and qualitative methods within a single study or program of enquiry.

MMM fosters interdisciplinarity. Pharmacy education researchers and indeed most researchers in areas of health education face a dilemma common to most "social science-applied science" interdisciplinary research. There is a need to conduct evidence-based scientific studies and at the same time explore wider social, behavioural and policy related issues inherent in education research. Therefore, the future of research across disciplinary boundaries lies in an approach that thoroughly investigates the phenomenon in question by combining the descriptive and statistical efficiency of quantitative methods with the qualitative ability to generate insights into the research question, without losing rigor. Mixed methods as a methodology is beneficial in this regard. It has been particularly recommended for policy-relevant social pharmacy research (Almarsdottir and Traulsen, 2009).

MMM gives priority to the research questions. It is considered an especially valuable tool when the research questions are multi-layered, (Aronson, 2005). While this may seem logical, purists (O'Cathain and Thomas, 2007), do not think so. Being a believer in methodological eclecticism, I am free to combine methods by choosing what I believe are the best tools to answer my

questions. Considering that quantitative questions within an under-examined research area are better answered when context has been established qualitatively, I would either need to mix methods or compromise on research quality (Tashakkori and Teddlie, 2010). In this research, fit-for-purpose education is not easily reducible to a single metric or survey item, hence, quantitative data alone would not produce the depth and richness of data necessary to understand stakeholder perspectives of fit-for-purpose education. In the same vein, qualitative research of these stakeholder perspectives may not be amenable to systematic comparisons and may fail to generate the type of feedback, such as statistics, required by policy makers to inform practice (Mc Laughlin, Bush and Zeeman, 2016). Hence, the need to combine methods since complementarity of data allows me to uncover different perspectives, get a clearer picture, and lead to crystallization (Sandelowski,1995).

MMM is particularly useful for new initiatives, emerging research areas, hard to measure constructs and complex phenomena. In such cases, datasets and findings are compared to explore convergence, divergence, contradiction, and development where one method is used explicitly to aid the other method (O'Cathain and Thomas, 2007). In this way, the shortcomings of one method can be made up for in the other method through integration, hereby maximizing the strengths, minimizing the weaknesses of each individual approach, (Hussein, 2009) and leading to richer and deeper meanings where the whole is greater than the sum of its parts (Barbour 1999, Creswell, 2009). With this approach, I can uncover complexities and subtle undertones from stakeholders that may otherwise be missed, and reveal how these influence their understanding of needs-based education (Cruz and Higginbottom, 2013; Mayan, 2009; Morse and Richards, 2002). Combining both methods expand knowledge and understanding of the process, content, and impact of development (Schifferdecker and Reed, 2009).

One intrinsic advantage of mixing and combining methods in this research was that it allowed for greater validation through enhancing the relevance, consistency, depth, context-specificity and scope of the quantitative instrument developed, considering that it was grounded in stakeholders' views and not just drafted from literature. This has therefore led to an increase in the integrity, confidence and applicability of research findings and recommendations (Flick, 2002; Schifferdecker and Reed, 2009). This multiple-methods approach is usually described as one of convergent validation, corroboration, or 'triangulation' (Webb et al., 1966) through establishing associations between and within different data types in a way that the evidence base is incremental, confirming existing propositions. One of the conceptual strengths of mixed methods research is that the inherent methodological integration involved offers a more holistic account of the

research topic, enabling greater depth of understanding of the investigated phenomena (Day, Sammons and Gu, 2008).

Summarily, using mixed methods research has provided a more comprehensive reflection of stakeholder perceptions of needs-based education in pharmacy by providing stronger inferences from different sources and presenting opportunities for a wider diversity of views (Tashakkori and Teddlie, 2003). It is efficient in the way that it has incorporated both meaning (stakeholders' perspectives) and measures (how strongly these opinions are held) in the same study and has enabled questions that would normally emerge at the end of a project such as how patterns of discussions with stakeholders are reflected in the new undergraduate curriculum to be addressed during the study. Mixing methods can therefore increase the scope of research possible by accessing both kinds of data.

2.3.2 Exploratory Sequential Mixed Methods Design

Research designs are procedures for collecting, analysing, interpreting, and reporting data in studies (Creswell and Plano Cark, 2011). Rigorous designs are important because they shape data collection procedures and determine data interpretation at the end of the study. Having decided on the mixed methods approach for the study, the next step was to choose the specific design that best addressed the research questions considering timing/sequence (decision to implement qualitative and quantitative phases concurrently or sequentially), weighting (priority or relative importance of qualitative and quantitative methods to answering the research questions), and mixing (how and when the two data types are merged, embedded or connected with each other).

Understanding that mixed methods methodology is a systematic process, the combination of both methods must use specific types of mixed methods design and interpret integration (Creswell, 2014). There are nearly 40 types of mixed methods designs (Tashakori and Teddlie, 2003), but these have been condensed to four major designs: triangulation design, embedded design, explanatory design and exploratory design (Creswell and Plano Clark, 2011), with variants within each type and peculiar strengths and challenges for each.

In order to achieve the aim and objectives of this project, I chose the instrument development variant of the exploratory sequential design (Creswell, 2003) (see figure 2.2) which has been adapted to fit this study (figure 2.3). In this design, I first collected and analysed the qualitative data and the subsequent quantitative phase was built on findings from the qualitative which in turn helped to interpret qualitative findings. Validated results from both informed the final documentary analysis phase.

Figure 2.2: Instrument development model of exploratory sequential design (Creswell and Plano Clark, 2011)

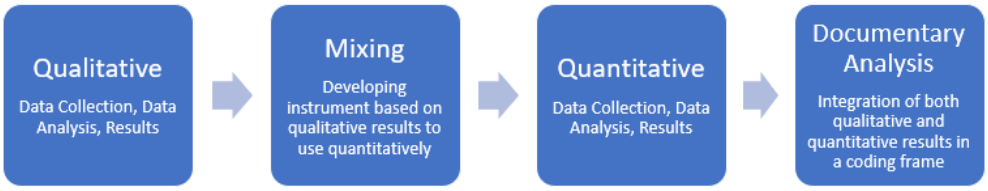

Figure 2.3: Adapted model for this study

In some variants, the quantitative phase is the "core project" while the qualitative is the supplemental component which provides access to an area germane to the research question, but which cannot be in the core component, hence it helps build the core project (Morse, 2010). The two phases are connected in the intermediate stage of the study. In this case, the qualitative was the core project, with the quantitative helping to determine if the qualitative views were nationally perceived (Johnson and Onwuegbuzie, 2004; Tashakkori and Teddlie, 1998). This choice was based on the premise that subsequent quantitative exploration of stakeholder perspectives will be needed to generalize responses. Hence, the questionnaire for the quantitative phase of my research was informed by codes from analysis of the qualitative phase involving both individual and group interviews, survey responses in return corroborated qualitative findings. Also being a complex phenomenon, important variables to study needs-based education quantitatively were not evident (Creswell and Plano Clark, 2007), hence this design was best (Creswell, 2003) because all three phases were mutually synergistic thereby leading to richer, more robust research. I was also able to explore stakeholders' perspectives of needs-based education in-depth on a national scale, determine geopolitical variations in responses, as well as perceived concerns and priorities to implementation. The goal of exploring stakeholders' perspectives was tremendously enhanced by thickening qualitative responses with quantitative data through this design, which allowed for a gradual and recursive emergence of pharmacy education fitness-for-purpose themes.

As should be with every mixed methods design, the scope of both qualitative and quantitative methodologies has not been reduced. Key elements, such as specifying a distinct approach for both the qualitative and quantitative phases, have been maintained. A generic qualitative inquiry was employed for the qualitative phase while a descriptive cross-sectional study was carried out in the quantitative phase as discussed below, see Figure 2.4.

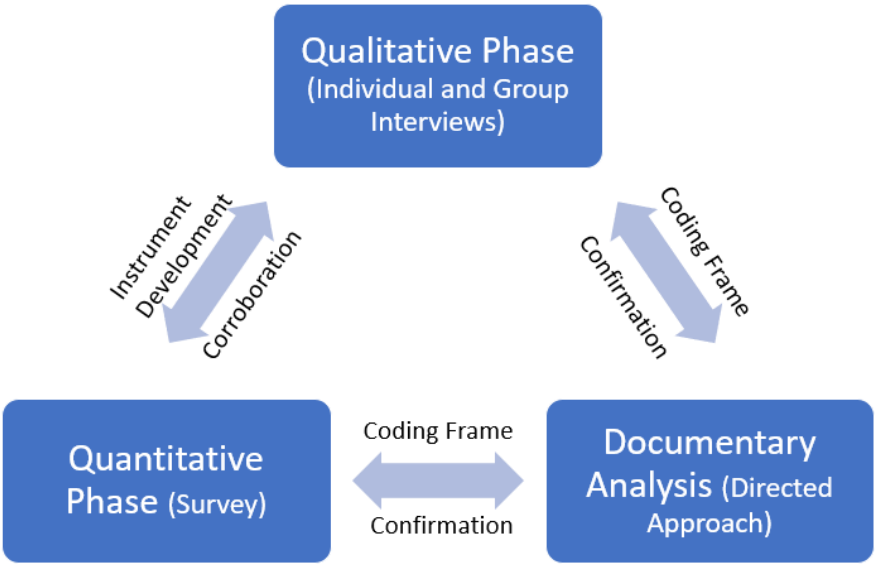

Figure 2.4: Interrelationship among phases in the adapted exploratory sequential design

Having three separate phases made it quite straightforward to implement and report. However, considerable time, effort and resources were required to implement this design and deciding on which data to use for instrument development from the qualitative phase was a bit difficult, since I had to balance the overall question and purpose of the survey instrument with the time required by respondents to complete it. There were also instances where qualitative and quantitative responses were contradictory which made it difficult to decide what the actual situation was (Schifferdecker and Reed, 2009). The freedom and ability to explore these contradictions within new initiatives and hard to measure complex phenomena, such as fitness-for-purpose, is one of the prime benefits of mixed methods research (O'Cathain and Thomas, 2007). How this was handled has been described in the methodological limitations section. Figure 2.5 shows how each phase answers the research questions.

Qualitative Phase	Quantitative Phase	Documentary Analysis
• What is the **current status of, and pharmacist perceived domains that, determine pharmacy workforce development** in Nigeria?	• What are the **barriers** and **facilitators** to n**eeds-based workforce development** in the context of Nigerian pharmacy practice, and the extent of their influence?	• How does the **Nigerian Benchmark Minimum Academic Standards (BMAS)** reflect both **global recommendations** and **local requirements for workforce development?**

Figure 2.5: How each phase answers the research questions

2.3.2.1 Qualitative Phase of the Exploratory Sequential Design

In research, there are instances where the question seeks to understand realities constructed from subjective experiences which cannot be objectively quantified (Parse, 2001), such as the inquiry into people's opinions, views, and perspectives to better understand the dynamics of needs-based education. Qualitative methodology is useful in this regard, and has also been employed in preparation of subsequent quantitative studies (Rowan and Wulff, 2007), where it serves to ground successive quantitative research in real-life situations and observations, thereby enhancing the later processes and final outcomes (Padget, 1988; Ulin, Robinson and Tolley, 2005). The past decade has seen a dramatic increase in the use of qualitative methods in various disciplines as well as education (Divan et al., 2017) and across several countries.

Qualitative approaches have been modified overtime to meet emerging needs of healthcare research and diverse populations (Morse, 2007), including combining two or more methods in the same study. In this study, qualitative methods used include the individual interview and focus group methods in the first phase, and the qualitative content analysis in the third phase of the research. This was a pragmatic decision- choosing best methods for different cadres of stakeholders in an effective and inexpensive way. Stakeholders in education leadership were individually interviewed as it was difficult to get them all in a room for group interviews, stakeholders in practice were interviewed in groups consisting of most areas of practice to generate rich discussions based on varying views. Using both individual and group interviews offered an opportunity to gain a better understanding and unravel deeper meanings of the education fitness-for-purpose phenomena which affect different facets of the pharmacy profession as well as influencing the

contributions pharmacists can make to society. Gathering additional qualitative data has been found to aid in the holistic understanding of participants' views and experiences (Creswell, 2012), leveraging on the interpersonal and interactive nature of focus groups to generate information on a wider range of views and ideas which might not be obtained from a single interview (Guest, Namey and McKenna, 2017).

2.3.3 Qualitative Methods

Despite great variation, qualitative methods are often interpretive and naturalistic seeking to understand the way people make sense of the world in which they live and their experiences in their natural settings (Cohen and Crabtree, 2006). Two qualitative methods were employed in this study: Semi-structured interviews (individual and group) to obtain pharmacy education stakeholder views on fit-for-purpose education, and documentary analysis to determine if these views are reflected in the recently drafted curriculum.

Key informant interviews and focus groups were conducted sequentially between April and June 2018 while constantly referring to documentary materials to clarify issues that arise. As a pragmatic researcher, I recognize that it is impossible to set aside one's own perspective totally and I have not attempted to do that in this phase. However, self-reflective attempts to "bracket" existing theory and my own biases afforded me a better understanding and representation of the participants' experiences. Matters such as context, language, history have been taken into account and these have relativized the knowledge gained to participants, the Nigerian context of needs-based education, and to me as the researcher. While those with positivist worldviews may struggle with the epistemologies and theoretical assumptions (Rowland and Myatt, 2014), the value of qualitative methods is widely appreciated (Rosenthal, 2016).

2.3.3.1 Interviews (Individual and Group).

Semi-structured interviews were useful for this exploratory study of needs-based pharmacy workforce development (Dejonckheere and Vaughn, 2019) which is an under-researched topic. They provided a hybrid compromise between structured and unstructured interviews with a good balance between participant freedom and interviewer control (DiCicco Bloom and Crabtree, 2006). They generated rich information and grounded the research in real-life situations and observations thereby enhancing the later quantitative process and final outcomes (Nassar-McMillan et al., 2010). Views and opinions of stakeholders on fit-for-purpose pharmacy workforce development were socially constructed and based on past and present interactions with the environment, they were therefore unique, and put together, produced a reality that could be analysed.

Focus groups have been recommended for exploratory research and need to be inclusive (WHO, 2017). In this study they encouraged natural conversation,

allowed consensus and debate, and facilitated generation of ideas. They identified patterns of discussions and constructs used by pharmacists as regards needs-based pharmacy education with the intention of utilizing findings to generate the quantitative instrument (McLafferty, 2004). The dual demand for societal specificity and the requirement to cover a wide range of areas, made the use of focus groups in the process of questionnaire design relevant (Nassar- Mc Millan et al., 2010). Focus groups helped me narrow down questionnaire items by cutting out context irrelevant items found in literature such as competencies for advanced clinical practice which were non-existent in Nigerian pharmacy practice. They also helped to develop a taxonomy of terms by accessing the language and concepts which structure participants experiences and identify common terms and phrases used in local discussion (Hughes and DuMont, 1993), such as the term “charlatans” used to describe non-professionals who illegally engaged in the sale and distribution of medicines. This aided the development of meaningful response categories in the questionnaire reflecting real world perspectives. An indirect utility of my focus groups was to provide societal awareness of the research which likely increased response rates to the final questionnaire.

While focus groups were useful for drawing conclusions about participants’ views, ideas and experiences, they had potential disadvantages. Some individual voices of dissent (Kitzinger, 1995) may have been silenced by the group dynamic. Focus groups were also not as strong as participant observation in their ability to observe phenomena in context, nor as strong as individual interviews in providing rich understanding of participants knowledge but were better at combining these two goals than either technique alone (Morgan, 1996). Understanding that all interviews are active despite attempts to regiment, standardize and neutralize the interview process, I have attended to the issues of knowledge co-construction, finding reality in interview accounts and interpretive practices employed. The research methods employed here focused on identifying key informants and ensuring that as many perspectives as possible on fit-for-purpose pharmacy education were captured.

2.3.3.2 Documentary Analysis

Documentary analysis was an important research tool which served a complementary role to the other methods and provided clarity on the fitness-for-purpose of the Nigerian pharmacy programmes. The analysis of relevant documents (Bowen, 2009), combining local and global standards was used to develop the coding frame for documentary analysis. A directed approach to content analysis was applied, where the pharmacy curriculum was compared to generated codes from study findings and global standard documents, providing a confluence of evidence that bred credibility and reduced the impact of potential bias.

Documentary analysis has typically been in the domains of hermeneutics, literary theory, and linguistics but has also been applied in other disciplines to create more compelling qualitative research especially in an era where more information is communicated via printed text documents (Wickens, 2011). It was previously mainly a quantitative method (Berelson, 1952), but following critiques on its lack of interpretive rigor, limited analytical flexibility, and research decontextualization (Kohlbacher, 2006), it can now be conducted both quantitatively and qualitatively (Schreier, 2012). In keeping with the mixed methods approach to the entire project, it is at the intersection between the qualitative and quantitative traditions. As a scientific process, it identified messages relevant to the needs-based education theoretical framework, coded the messages, and systematically analysed the messages to build the coding frame and gain a better understanding of curricular global and local relevance. It is one of the most common approaches to the analysis of documents (Bryman, 2004) and was useful in this study for rigorous exploration of the important but hard to study issue of curricular relevance, as it tried to present the content in an objective form.

In this study, documentary analysis facilitated the identification of curricular concepts, fitness-for-purpose themes, foci, and indicated comprehensiveness of curricular coverage, major and minor oversights, intentions, curriculum developers' bias as well as global standards not suited to context when comparisons were made. It converted the large chunk of unstructured data within the study findings, Basic Minimum Academic Standards (BMAS), Global Competency Framework (GbCF), Pharmaceutical Workforce Development Goals (PWDGs) and Nanjing statement (NS) documents into manageable content, described characteristics of the content, and identified important aspects in each. Both conceptual and relational analysis were undertaken, establishing the existence and frequency of concepts in each document, examining the concept relationship among documents and comparing these with curricular standards. Findings from this phase were used to support or refute arguments on curricular relevance and to make necessary recommendations to policy makers.

Content analysis is an unobtrusive means of analysing interactions. While being quite useful for systematically interpreting textual data, hence getting to the core of complex social interaction or obscure meaning, it can be extremely time consuming. Limits to its use may also be quickly realized when using relational analysis to attain higher levels of interpretation.

2.3.3.3 Quantitative Phase of the Exploratory Sequential Design

Quantitative methodology is an objective, logical and systematic method of analysis focusing on gathering numerical data, analysing using mathematically based methods (statistics) and generalizing it across groups of people to generate reliable knowledge or to explain a particular phenomenon (Aliaga

and Gunderson, 2002). Phenomena here are defined as observable measures. In the context of this study, they are stakeholders' perspectives of fitness-for-purpose domains, attendant barriers and facilitators, and relevant competencies with variation by sociodemographic characteristics. While these phenomena do not seem likely to produce any quantitative data, data that do not naturally appear in a quantitative form can be collected quantitatively by designing research instruments aimed specifically at converting phenomena into quantitative data that can be analysed statistically. This involved developing a questionnaire where stakeholders' responses are based on scales which would enable statement number rating.

The design for this phase was a descriptive cross-sectional one which was relatively quick and easy to conduct since it did not require long periods of follow up and data on all variables were collected once. However, non-response was a problem inherent to this design especially as the characteristics of non-responders may differ from those of responders. Though the response rate of 34% in this study is considered good for an online survey with usual averages of 25-30% (Yun and Trumbo, 2008), especially considering that e-mail response rates have decreased over the years (Sheehan, 2008).

This design helped to describe the sociodemographic characteristics of the pharmacist population being studied, established associations between stakeholder responses and these characteristics, looked at the spread of the data and central tendency, hence provided simple summaries of the pharmacist population and their perceptions. In keeping with the descriptive design, I did not begin with a hypothesis but formed one after data collection was completed. This phase of the study corroborated the conceptual framework of domains from the qualitative phase that may be pertinent to ensuring pharmacy education fitness-for-purpose in the developing country context, as well as potential barriers and facilitators to ensuring needs-based pharmacy education. This may be useful for planning, analytical and explanatory purposes towards the advancement of the pharmacy profession. Data collection was done using survey questionnaires as the research instrument. This tool was validated to ensure that measurements are reliable, and a pilot conducted to improve all aspects of study design prior to full scale study. When used appropriately quantitative techniques can be very valuable (Williams, 1992). This study was done as objectively as possible understanding that objectivity is key in the evaluation of quantitative data.

2.3.4 Quantitative Method: Survey

The survey aimed to obtain information from respondents which were analysed, patterns extracted, relationships demonstrated, and comparisons made by asking the same questions of a representative stratified random sample from the selected pharmacist population (McColl E et al., 2001). It was

a cost-effective and reliable means of gathering relevant and accurate data through thoughtful design, testing and administration. It provided a snapshot of stakeholders' perceptions of pharmacy education between June and September 2019 (Denscombe, 1998). Surveys are well-suited to descriptive studies such as this (Kelley et al., 2003).

Benefits included that I could administer to a large national pharmacist population from different geopolitical zones at once, in that way it also minimized cost. Email surveys were non-intrusive in the way that respondents did not feel the pressure of the researchers' presence. Feedback received during the pilot showed that completing the questionnaire was quite simple and straightforward. This was an advantage since research has shown that simpler questionnaires improve the response rate and response accuracy (Draugalis and Plaza, 2009). There are two basic kinds of questionnaires, standardized ones and original ones. Standardized questionnaire are quite generalized in nature and have a one size fit all approach to questioning, however they have the benefit of validity and reliability, original ones are custom designed and are intended to serve a specific purpose, they are designed to address specific questions and need to be established and validated. An original questionnaire was used for this study and the process of validation has been described below. In this study, question wording and careful piloting ensured that all questions mean the same thing to all participants (Woodward, 1988). Also, great care was taken to ensure that the sample population was truly representative through random stratification.

2.4 Research process

2.4.1 The Field Work

The preparation to travel for field work took a lot longer than anticipated, because there were safety concerns about my travel to Nigeria. It is important to mention here that I am Nigerian and had arrived the UK for my PhD roughly a year prior to the field work application. In fact, I was advised against a visit to my home city where I had lived for over five years immediately preceding my journey to the UK based on travel advice from the Foreign and Commonwealth Office. Appendix 3 provides an overview of the travel advice. I complied, though I did not share their fears. This in a peculiar way made me realize that reality is indeed constructed by individuals based on information, experiences and exposure. I travelled to Nigeria in April 2018 for the multi-sited field work, did a lot of travel within Nigeria because stakeholders were located in different parts of the country, and returned to UK in June 2018 having completed my fieldwork. I was able to spend just four months collecting data because I had made necessary contacts and scheduled interviews while in UK prior to my departure.

2.4.2 Sampling and Selection

To ensure research validity in this study, sampling techniques stemmed logically from the conceptual framework and research questions, generated sufficient data on needs-based workforce development, and reasonably led to the possibility of making clear inferences or credible explanations from data (Kemper and Teddlie, 2000). Quantitative studies often use probability sampling techniques to demonstrate representativeness of findings, qualitative studies having smaller samples, tend to use non-probability sampling to seek information from groups and sub-groups of the population. In this mixed methods study, however, these techniques were blended. Proponents of mixed methods research also argue that adding a quantitative component that surveys a randomly selected sample is likely to lead to generalizability (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004; Johnson and Turner, 2003).

Stakeholder theory, though a business concept (Phillips, 1997) has been applied in this study mainly because of its power of fair representation and shared ownership for decisions made. In keeping with this theory, students (who are culturally considered a lower group in the power hierarchy and often not included) were included, as well as internal (pharmacy educators, pharmacy students), and external (pharmacists in other areas of practice, regulatory bodies) stakeholders of different cadres, across several sectors of practice, spanning all six geopolitical zones in the country. Specific stakeholder categories (figure 1.7) were in line with categories of stakeholders suggested by FIP (2014) for quality improvement, and Mendelow's (1991) suggestion that stakeholder groups be analysed based on their ability to influence strategy and project resources, and how interested they are in the success of the project, and prioritized accordingly (see figure 2.6 below).

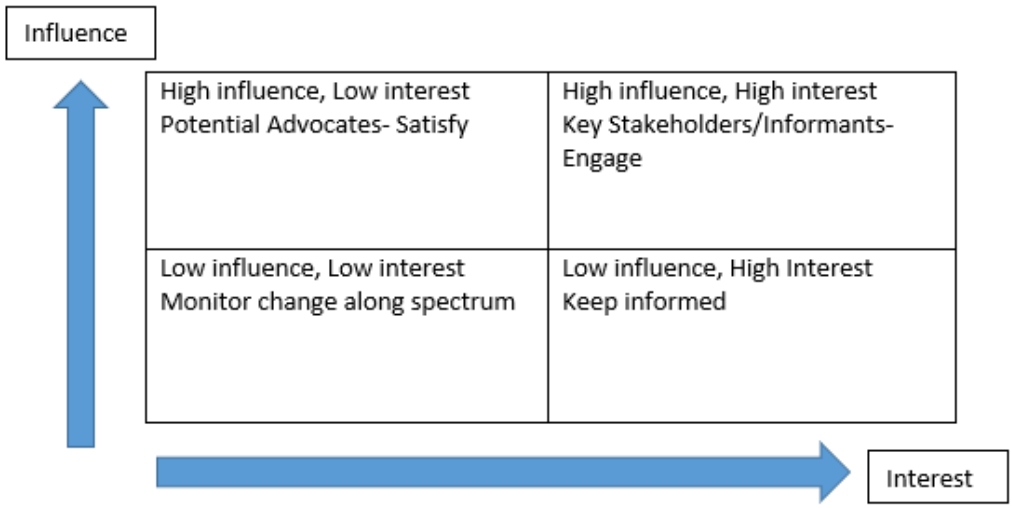

Figure 2.6: Mendelow's (1991) matrix for stakeholder priority

Stakeholder opinions and perceptions were the major data utilized in this study. Perception data refer to the expressed views and opinions of a group of people on a particular topic. It allows people to make subjective assessments of objective conditions. It provides the respondents own view directly, perceptions of themselves and their world, which are unobtainable in any other way. Their subjective judgements matter regardless of the objective circumstance, people may react to it if they can with consequences for how it will be experienced and the eventual success of the intervention (Coulthard et al., 2014). Also, some things are best assessed in subjective terms because what really matters is how people experience them (Gough and McGregor, 2009; Coulthard et al., 2014). For example, while providing aid to LMICs in the past, donors would often also determine what different groups of people perceive to be the best use of those resources. When Leo (2013) investigated whether USAID was prioritizing issues that mattered most to aid-receiving countries, he discovered that only 16% of the aid focused on the top three issues. Resources would have been better utilized if perception data was first sought.

The usefulness of perception data also lies in the relevance of the population from whom opinions are sought which was paramount during stakeholder selection in this study. Perception data is increasingly being used in research for monitoring changing situations over time within countries and as warning signals for policy interventions. They have implications for improvement efforts, can help to drive policymaking by providing information on people's priorities. Despite many benefits, the main limitation is the challenge of ensuring the reliability of the information obtained. This was mitigated in this study by triangulating qualitative responses with quantitative results and subsequent documentary analysis.

Stakeholder analysis was conducted prior to fieldwork to identify key stakeholders for the qualitative phase of this research, their level of influence, how important needs-based education is to them and how they will be engaged. It helped with development of effective communication and engagement strategies. For the qualitative phase, theoretical and purposive sampling (Kemper and Teddlie, 2000) was used to identify specific locally practicing pharmacy workforce development stakeholders in various sectors of pharmacy practice, since they could provide relevant information on the needs-based pharmacy education phenomenon being studied. Purposive sampling relies on the judgement of the researcher to select participants for the study in which case it is prone to researcher bias. Theoretical sampling meant that I kept recruiting until I felt that I had enough data to answer the research question and nothing new was being uncovered. To minimize this bias, stakeholder analysis was used to map key stakeholders and variation by area of specialty and geopolitical zones were considered. The main goal of purposive sampling focussed on particular characteristics of a population of

interest which will best enable me to answer the research questions. The sample was not representative of the population, but for mixed methods research this is not considered a weakness.

Stakeholders were eligible to participate if they were registered pharmacists or pharmacy students, key informants as determined by the stakeholder mapping matrix, and were willing to give informed consent. Table 2.1 below shows inclusion criteria for stakeholders. Key informants representing the various sectors of pharmacy practice and geopolitical zones in Nigeria were accessed through PCN (the body which regulates pharmacy education and practice). This was a useful recruitment strategy in a culture that relies heavily on social connections and influential intermediaries and where informal and formal gatekeepers play a crucial role in recruitment (Biernacki and Waldorf, 1981). It should be stated here this culture is endemic to Nigeria as a country (Agboola, 2016) and without PCN serving as gatekeepers, access to key stakeholders within the pharmacy profession would have been extremely difficult, in fact experience has shown that it may have been impossible. Zonal co-ordinators forwarded email addresses and phone numbers of participants to me (with participant's approval). Text messages followed by a phone call a few days later were sent to the participants explaining the purpose of the research and seeking voluntary participation. One stakeholder per sector of practice and per zone was invited to participate in the focus groups. Two focus group participants who were unable to attend due to prior engagements were asked to suggest suitable alternatives who replaced them.

All deans of accredited pharmacy schools in Nigeria were interviewed individually as well as five key decision makers in pharmacy education: three directors of regulatory bodies, a curriculum developer, and a PharmD proponent. The deans were gathered for an education committee meeting in Lagos Nigeria a few days after I arrived, I had been pre-informed of the meeting and sought the permission of the PCN registrar to have a brief focus group with them to scope my research. This was also an avenue for me to recruit them for the individual interviews which took place over the next three months. The other five key decision makers were contacted directly, and mutually convenient dates set for the interviews.

Table 2.1: Inclusion criteria for stakeholders.

Item	Description
Nationality	Nigerian
Undergraduate Education	Pharmacy
Undergraduate Degree	BPharm or PharmD
Occupation	**Pharmacist
Registration Status	Registered to practice in Nigeria
Area of Practice	Within Pharmacy at some point

**Final Year Pharmacy Students were also included for the qualitative phase

For the quantitative phase, stratified random sampling was used to choose a representative sample from the pharmacist population in Nigeria. A list of all Nigerian registered pharmacists was provided by the Pharmacists Council of Nigeria and a representative sample calculated by stratifying pharmacists into six geopolitical zones. Table 2.2 shows stratification done for sampling.

The total number of registered pharmacists in Nigeria based on 2018 statistics is 13,457. This constituted the sampling frame for this research. This list was obtained from the Pharmacists Council of Nigeria. Hence the population size for this research is 13,457 with a 5% margin of error, 95% confidence level, and estimated response rate of 10% the required sample size can be calculated as

Sample size = $(\text{Z-score})^2 * P * (1-P) / (\text{Margin of error})^2$

Required sample size =374 pharmacists.

Since the estimated response rate is taken as 10% the number of participants to invite would be

374 x 10 = 3,740 participants.

The percentage of pharmacists in each geopolitical zone was calculated from the sample frame and used to calculate the number of pharmacists to be invited from each geopolitical zone.

Table 2.2: Stratification done for survey sampling

Geopolitical Zone of Practice	North Central	North East	North West	South South	South East	South West	Abroad	Total
Sample Frame (n)	2795	544	999	2150	1443	5360	166	13457
Sample Frame (%)	21	4	7	16	11	40	1	100
Stratified Sample (n)	786	150	262	598	411	1496	37	3740
Respondent Distribution (n)	288	82	128	188	87	479	**12+27	1291
Respondent Percentage (%)	22	6	10	15	7	37	**1+2	100

**- 12 abroad and 27 did not respond to this demographic.

2.4.3 Data Collection

Qualitative and Quantitative data were collected in two main phases respectively in a way that remains true to the exploratory sequential design. Data collection for the entire study began in April 2018 and ended in

September 2019. Appendix 2 provides an overview of timelines for the 3-year research project.

Qualitative data collection began in April 2018 with a key stakeholder focus group, all deans of the accredited pharmacy schools or their representatives, the directors of the regulatory bodies were in attendance. The purpose of the focus group was to validate the already crafted interview schedule and for general scoping of the Nigerian Pharmacy education terrain which I was already quite familiar with, having been away for a while and with the recent approval of the PharmD as the minimum requirement for undergraduate qualification, there was a need for a scoping focus group to ensure that I ask the right questions at the interview. This focus group lasted about 20 minutes, was audio recorded and transcribed immediately after to determine patterns of discussion, and useful themes. The interview schedule for stakeholders was modified based on findings from this focus group.

After this, individual interviews were all conducted over a period of three months, ovser the phone or in the dean's offices, and each lasted about 45 minutes, a few less than this and just one over an hour. Twenty-three interviews were conducted (see table 2.3), the first few dean interviews had questions that were exploratory and expansive, the questions became more refined as the interviews progressed building on responses from previous interviews. Interview guides (Appendix 4) were prepared before the field work began and approved for use by the University of Nottingham School of Education ethics committee. These were the guides used for the dean interviews, the decision maker interviews were tailored specifically to reflect the office of the participants and their individual experiences. In keeping with the pragmatist paradigm, the research question informed the structure and content of the guide, which was grounded in literature, personal expertise as a pharmacy educator and modified based on information gleaned at the key stakeholder's pilot focus group earlier mentioned. The participants were asked open questions about their views on pharmacy education in Nigeria, strengths and weaknesses in light of the undergraduate programme change, as well as barriers and facilitators to needs-based workforce development.

Table 2.3: Geopolitical spread of deans interviewed

GEOPOLITICAL ZONE	NUMBER OF DEANS INTERVIEWED
NORTH EAST	1
NORTH CENTRAL	2
NORTH WEST	2
SOUTH EAST	2
SOUTH SOUTH	7
SOUTH WEST	4
TOTAL NUMBER	18

Key decision makers were contacted prior to the fieldwork to inform them about the study and seek their consent to be participants. They were called again when I arrived Nigeria to schedule a mutually convenient date for interviews. The interviews sought to understand views on needs-based pharmacy education in light of the recent programme switch, how societal issues may influence implementation and possible facilitators to the success. Phone interviews were all held in a private room to maintain confidentiality while face to face interviews were held in the offices of participants for mutual convenience. Consent to participate was sought by signature at the pilot focus group which they attended, and then verbal consent was sought again for the phone interviews. I ensured that I did not conduct more than two interviews per day to give time to process the information received, reflect on what went well and what I might do differently for subsequent interviews.

Focus Group participants were accessed through PCN. Text messages were sent to the participants explaining the purpose of the research and seeking voluntary participation weeks before, followed by a phone call a few days prior to the interview. One stakeholder per sector of practice and per zone was invited to participate in the focus groups giving consideration to gender ratio and level of experience of the participants. Gender balance was difficult to attain especially in the Northern geopolitical zones where participants suggested were predominantly male, on my insistence a few female participants were included. Despite this only 29% of the total participants were female (See table 2.4). Some (Carey and Smith, 1994) argue that participant homogeneity should be maintained in focus groups while others think this is unnecessary (Fern, 1982). I agree with Calder (1977) that the purpose of the group should dictate the degree of homogeneity. Considering that this research is exploratory, heterogeneous groups may provide richer information (Mc Lafferty, 2004). However, being about needs-based pharmacy workforce development means that gender imbalance is unlikely to skew responses significantly. Consent was confirmed by signature just before the focus groups began. Five focus groups were conducted across the six geopolitical zones. Krueger (1994) suggest that a minimum of three and maximum of 12 focus groups may be sufficient to generate required data. Nyamathi and Schuler (1990) agree with this and think response saturation should be attained by the fourth group. However, Stewart and Shamdasani (1990) think that there are no general rules and the required number may vary based on research application and should be worked out by the researcher, which I did. Specific stakeholder characteristics for the focus group can be found in Table 2.4.

The focus groups were held in the PCN zonal offices or seminar rooms of the university to ensure a neutral yet familiar setting (Dilorio et al., 1994; Mc Lafferty, 2004) with between 8 and 15 participants per group. 55 pharmacists

in all participated in the five focus groups, with group numbers ranging from 8-13, representing various sectors of practice. The recommended participant number for focus groups in the literature varies. Krueger (2002) suggests that 5-10 participants per group is the norm with 6-8 being the preferred range, some say 6-10 (Morgan, 1988), yet others 8 (Guest, 2017). The range varies as widely as 4-20 in some publications (Mc Lafferty, 2004). I think that several factors including the sensitivity of topic to be discussed should influence the number of participants chosen. The number 11 was adequate in this case, as the topic discussed was not a complex one, it ensured that all relevant sectors of practice were represented to ensure every perspective was captured and reduced the pressure to contribute (Morgan, 1988) which may have been more in a smaller group. I served as the facilitator in all five focus groups and employed the low control, high process style advocated by Millward (1995). The sitting arrangement was around a table in a comfortable room (Krueger, 2002) so everyone could see and be seen. I gave a brief introduction and gave the group leeway to discuss the topic while guiding the discussion by asking predetermined semi-structured open and probing questions, and when necessary, handling participant dominance (Krueger, 1994) when there was any attempt to "hijack" the discussion. Ideas from earlier focus groups were iteratively introduced into subsequent groups as part of probing (Guest, 2017), and I let groups challenge ideas from other focus groups in order to gain some form of consensus or otherwise (Mc Lafferty, 2004). In all focus groups, participants established a common communicative ground, contributions were added to that common ground as they aligned with or rejected ideas. Participants initially spoke in their capacity as sector representatives but as the group dynamic became more relaxed, personal experiences and opinions were shared (Hyden and Bulow, 2003). Group dynamics stimulated discussion and generated a wider range of views than could be captured by individual methods (Kitzinger, 1995; Krueger and Casey, 2015; Robinson, 1999). Understanding that the purpose of the focus group was not to arrive at a consensus (Morgan, 1988), varying views were encouraged. However, I realize that the presence of an audio recording device may have caused the participants to sanitize their views so that true feelings are not represented (Polgar and Thomas, 1995). Lunch was provided to create a relaxed atmosphere (McDaniel and Bach, 1994).

Table 2.4: Characteristics of individual and group interview participants

CHARACTERISTICS	INTERVIEWS	
GENDER	**Individual N (%)**	**Group N (%)**
MALE	20 (87)	39 (71)
FEMALE	3 (13)	16 (29)
GEOPOLITICAL ZONE OF PRACTICE		
NORTH EAST	1 (4)	2 (3)
NORTH CENTRAL	3 (13)	3 (5)
NORTH WEST	2 (9)	13 (24)
SOUTH EAST	2 (9)	13 (24)
SOUTH SOUTH	8 (35)	13 (24)
SOUTH WEST	7 (30)	11 (20)
SECTOR OF PHARMACY PRACTICE		
ACADEMIA	19 (83)	19 (35)
COMMUNITY	-	10 (18)
HOSPITAL	-	5 (9)
ADMINISTRATIVE/REGULATORY/OTHER	4 (17)	9 (16)
INDUSTRY	-	5 (9)
PUBLIC HEALTH	-	2 (4)
STUDENT	-	4 (7)
INTERN	-	1 (2)

Convening five focus groups on the same topic helped to validate views discussed by individual groups. The purpose of the schedule was to guide discussion, stimulate conversation and ensure required information is obtained (Dilorio et al., 1994). The schedule began with engagement questions to introduce participants to the topic and get them comfortable with the discussion, followed by exploration questions which comprised the main questions, follow up questions, probes and prompts, which were all open-ended and finally exit questions to see if any angle was missed during the discussion. Field notes were made immediately after the interviews (Krueger, 2002; Mc Lafferty, 2004). All interviews were audio recorded (Polgar and Thomas, 1995), transcribed verbatim, and subsequently imported into NVivo12 (a qualitative data analysis computer software program) for analysis.

2.4.4 Questionnaire Development

Themes and subthemes generated from the qualitative research together with items identified from literature were merged to develop a questionnaire to assess pharmacy education stakeholder's perspectives. Items for survey instruments can be developed from literature (Jaeger, 1984) or from a preceding qualitative study phase (Vacc and Loesch, 1993; Fuller, Edwards, Vorakitphokartorn and Sermsri, 1993; Hughes and DuMont 1993; O'Brien, 1993). The objective of the survey was to determine if qualitative views on needs-based pharmacy education were nationally perceived and to describe these views based on demographics collected. Since little information was known on needs-based pharmacy education there was a need to gather initial data using an exploratory approach to gain information and ensure the items were grounded in the views of the participants. Pharmacy education stakeholders represent an excellent resource for obtaining information critical

to identifying and selecting items (Vacc and Loesch, 1993) for the questionnaire. A semi-structured questionnaire was the instrument of choice comprising closed questions, laid out in a standard and logical form to record individual respondent's perspectives.

2.4.4.1 Item Generation

The purpose of item generation was to consider all potential items for inclusion in the questionnaire in order to identify important domains identified in the qualitative phase (Kirshner et al., 1985). No items had previously been developed for this purpose. An initial comprehensive list was made of all items that could go into the questionnaire, this went on till no new items emerged, called sampling to redundancy. At this stage, 98 items were identified. I created a table of specifications (Henry, 1986) with the research questions in one column and items on the other (Appendix 6). This table was revisited often as changes were made to establish validity (Ehrlich et al., 2006), after which I began identifying superfluous items in the next stage.

2.4.4.2 Item Reduction

The items were refined by combining, eliminating and splitting. I grouped items into categories based on concepts I wished to explore determined by the research questions and limited the number of potential categories by an iterative process of combining, eliminating, splitting, and began to formulate questions within these categories. Questions were constructed from the items ensuring that they were appropriate, able to be answered by selected respondents, drafted in the language the respondent uses (this was possible because of previously conducted interviews), with the same meaning both to me and the respondents, unlikely to trigger one response more than others, capable of coping with all possible responses. At this stage there were 40 questions.

2.4.4.3 Questionnaire Formatting

Questions were rephrased to ensure they generate useful answers by ensuring they were without bias (Stone, 1993), simple and specific (Passmore et al., 2002), void of jargon, complicated, and ambiguous words (Henry, 1986) to improve reliability. An appropriate Likert scale response format was developed, and response bands were introduced for demographic questions ensuring that fixed responses were exhaustive but mutually exclusive, that do not overlap to avoid answers being caught in the cusp. After review by supervisors to evaluate whether the questions effectively capture the topic under investigation, and check for common errors such as double barrelled, confusing and leading questions, further revision was made to 18 questions, and only 34 questions remained. These were put in appropriate sequence to bring logic and flow to the survey, starting with broader questions and then narrowing down. The questionnaire was formatted with participant information, clear instructions to the respondents and drafted on JISC online

survey platform in grid form to enable respondents to quickly move through the questions. There was an introduction before each change in theme to help the respondent make an easy jump.

2.4.5 Survey Distribution

The final layout of the questionnaire was piloted on a subset of the intended pharmacist population to iron out any design faults that may have been missed and enable a formal evaluation to be performed (Stone, 1993). Respondents were asked to examine the flow, importance, completion time and ease as well as comprehensibility of the questionnaire. It was revised based on feedback from the pilot phase (Bowden et al., 2002). This was done to validate the questionnaire (Collins D, 2003) at the same time shared with senior colleagues (Turocy, 2002) who made their input. One negatively phrased question was used to determine if the participants filled the survey inattentively. One question was removed because it was repetitive, and five were added. There were 38 final questions excluding the competencies chart this was a bit higher than the usual average of 25 questions (Passmore et al., 2002) but had at least 5 questions in each domain as recommended (Fox J, 1994). The online survey was open on the 6th June 2019 and sent via email to a stratified random sample of 3,740 Nigerian pharmacists. Reminders were sent monthly. The first was via SMS and the other a reminder email. Stratification and distribution can be seen in the sampling and selection section (See Table 2.2). The final response rate was 34%. Securing a higher response rate was also quite difficult especially considering the survey was administered electronically (Kim et al., 2000; Raziano et al 2001).

The survey method was useful for producing a large amount of data based on real-world observations in a short time span at a low cost. The breadth of coverage also meant that it was likely to obtain data from a representative sample and can therefore be generalizable. Disadvantages, however, included the typical lack of detail or depth of the topic being investigated. This was mitigated in this study by a previous qualitative phase.

2.5 Integration of Methods

A study with a qualitative and quantitative component without integration is not a mixed methods study (Creswell and Plano Clark, 2011). In mixed methods analysis integration is critical, yet often confusing, as one may ask how it is possible to reconcile words with numbers. However, integration is the nucleus of a mixed methods study (O'Cathain et al., 2010), hence there must be a demonstrable relationship and synthesis between the quantitative and qualitative phases. The strength of the study is only actualized when the two data sources are combined (Creswell, 2014). It is very important to get a proper understanding of how it is done. Integration simply describes merging, explaining, connecting, building, or embedding both quantitative and qualitative data sources in mixed methods research. It has been defined by

Woolley (2009) as the extent to which quantitative and qualitative components are explicitly related to each other within a single study in such a way as to be mutually illuminating, thereby producing findings that are greater than the sum of the parts. An understanding of the study design is prerequisite to an understanding of how and when the data sources should be integrated because sometimes integration is built into the research design as is the case with this research where qualitative data informed the development of the quantitative instrument, hence are interdependent in reaching a common research goal (Bazeley, 2016).. In this study, integration was built into the research design where qualitative themes informed quantitative instrument development and was further observed while reporting the study, where quantitative findings corroborated qualitative themes in narration

2.6 Data Analysis

Data analysis refers to the process of breaking up a complex topic or substance into smaller parts in order to gain a better understanding. It is a process of deconstructing and reconstructing evidence that involves interrogation of and critical thinking about data and the questions they are designed to answer in order to produce a useful and/or meaningful result. Viewing analysis as the continuation of a conversation between methods that began when the foundations of the study were laid, I had to ensure that the data I had available were sufficiently able to answer these questions. The process of data analysis for me began on the field during data collection (Marshall and Rossman, 1995), all the while keeping my focus on the whole data set and my research purpose with the understanding that this is all part of the continuing conversation. Field notes and memos taken during data collection were useful in the analysis process, recorded reflections, insights and ideas helped further analysis.

The qualitative data analysis was conducted first being a prerequisite for the quantitative instrument development. The first step in the process of analysis was the pre-processing and cleaning of data to get it ready for analysis, this involved sorting audio files and transferring them from the recording device to a secure computer, transcribing them verbatim, quality checking the transcripts, and exploring the text files to see what was there. The text files of the audio recorded interviews were imported into NVivo 12 for initial coding to identify relevant concepts and categories.

Thematic analysis was carried out following the six steps laid out by Braun and Clarke (2006) (see figure 2.7). Considering that thematic analysis has been described as a poorly demarcated, rarely acknowledged yet widely used analytic method (Boyatzis 1998; Roulston, 2001), I have taken care to describe systematically how I went about analysing my data. I chose this method because of its flexibility and its ability to capture important parts of the data

in relation to the research question which would be useful as items for the survey instrument. It also gives a patterned meaning to the data set which provides rich descriptions and a detailed account when reporting qualitative findings.

To ensure proper analysis was done, questions that guided coding and analysis of data were different from questions asked during the interview, which in turn were different from the research questions. Themes were identified both inductively and deductively. Deductively, in the sense that I was concerned with addressing specific research questions and analysed the data with this in mind. I looked for patterns of discussions that referred to needs-based workforce development, its facilitators and barriers. Inductively because I derived domains for needs-based workforce development from the data set (Patton, 1990; Fade and Swift, 2011), I coded every piece of text line by line using open coding, I developed and modified codes as I worked through the data set. Analysis in this study sometimes went beyond the semantic or surface meanings of the data to the latent (Boyatzis, 1998) in order to identify underlying ideas, assumptions and ideologies which shaped semantic content of data. This was done to better understand stakeholders' perspectives and possible reasons for their responses.

After transcribing the audio files for both individual and group interviews verbatim, ensuring that meaning was maintained, and the transcripts were true to the original interviews with everything taken in context, and suited to the purpose of analysis (Edwards, 1993). I went through transcripts of the interviews again and shared both audio files and transcripts with my supervisors to cross-check transcripts against original audio recordings for accuracy. The specific steps taken during data analysis are briefly discussed below:

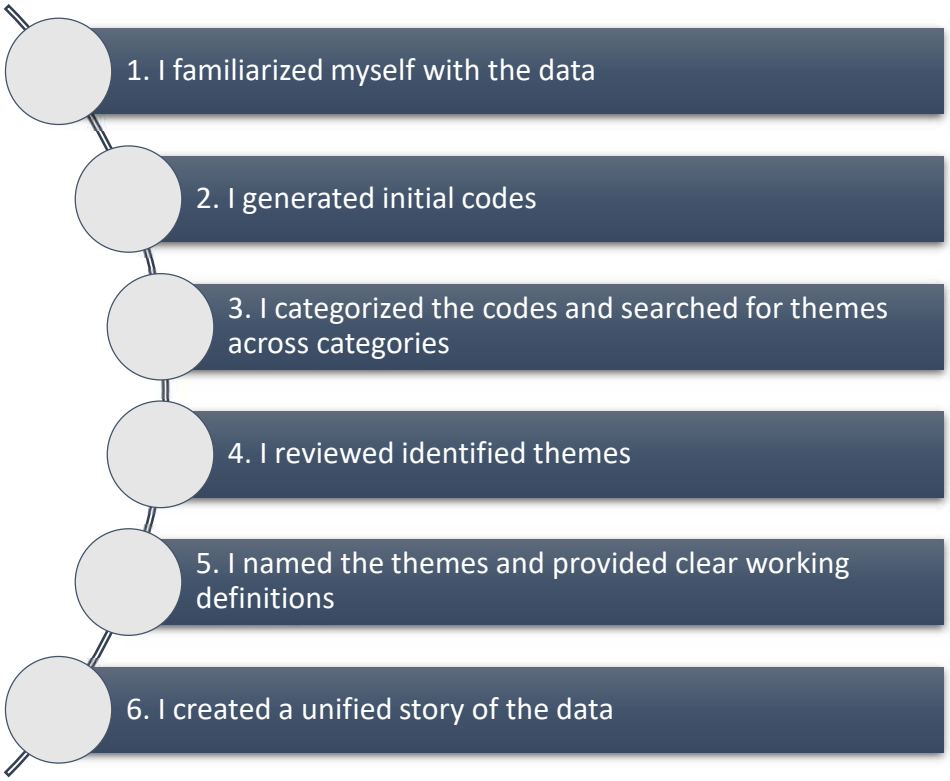

Figure 2.7: Data analysis process

(1) The first step involved familiarizing myself with the data by listening to audio files, reading and re-reading the transcripts of audio-recorded interviews (though I collected the data myself and had good knowledge of it). Quality checking and self-reflection notes, and the process of transcribing which I did myself also aided immersion in the data and active engagement with the data (Riesman, 1993; Lapadat and Lindsay, 1999). At this point, I began to get a feel for recurring patterns, similarities and differences across the data. I noted my initial thoughts down to crosscheck later in subsequent stages and with findings. This provided a good foundation for further analysis.

(2) I generated initial codes which were basically meaningful and interesting data features providing context to the conversations (Boyatzis, 1998). Coding was done using NVivo, a software programme to aid data management. This was part of analysis (Miles and Huberman, 1994). I coded for as many patterns as possible, trying at all times to retain context (Bryman, 2004). Multiple coding was done, supervisors as well as colleagues independently checked segments of texts against codes to mitigate the subjectivity risk inherent in this process.

(3) I categorized the codes and searched for themes across categories. This was the beginning of the interpretive analysis of collated codes. Similar codes were sorted into categories and then themes developed to summarize the essence of categorized codes (Morse, 2008). Categories were either split or combined into overarching themes by linking categories with social theory

until an overriding explanation was arrived at which made sense of the various patterns that emerged at the descriptive level (Green et al., 2007). The role of the researcher as the instrument became apparent at this stage and my thoughts processes alluded to relationships between and within codes and themes.

(4) I reviewed identified themes and decided whether to combine, separate, refine, or do away with initial themes. This was determined by data coherence within themes and distinct differences between themes and done in two stages. The themes were checked with coded extracts first, and then this stage can be found in appendix 7 showing the flow from initial coding to how final themes were developed. At this point findings from the research were sent back to participants for member checking (Barbour, 2001) to ensure my interpretation of the data are true to participants' perceptions thereby enhancing trustworthiness of the study (Lincoln and Guba, 1985).

(5) I named the themes and provided clear working definitions that captured the essence of the themes accurately and concisely. While considering how each theme will fit into the broader picture. Sub-themes were also identified at this stage.

(6) Finally, I created a unified story of the data by transforming my analysis into an interpretable piece of writing (Braun and Clarke, 2006), and then used the themes and sub-themes to develop the quantitative instrument.

Despite numerous advantages discussed above, it was difficult to decide what aspects of the data to focus on for instrument development. During analysis, contradictory evidence was purposefully sought out and accounted for to ensure that bias does not interfere with data collected or analysed.

For the Quantitative phase, the JISC online survey platform was used for survey data collection. Data analysis involved computation of descriptive statistics; measures of central tendency and measure of dispersion, reducing data into appropriate and simplified tables and graphs, cross tabulations and integrating data into a coherent whole, using SPSS version 26. After which data was interpreted, used to corroborate qualitative findings and conclusions presented.

2.6.1 Process of Documentary Analysis

Documentary materials were useful in this study to differentiate fact from opinion. Documents were collected throughout the research period whenever they became available. Relevant standard documents were used to validate the curriculum in the third phase of the research and other documents served a complementary role to data collection methods. For example, the list of all registered practicing pharmacists was required for the survey to accurately determine a representative stratified sample based on geopolitical zones. During the field trip official educational materials as well as pharmacy practice

documents were purchased at one of the zonal offices of the Pharmacists Council of Nigeria to understand the history of pharmacy education and practice in Nigeria.

The aim for documentary analysis was to determine if undergraduate pharmacy curricula were locally relevant and globally compliant. In order to achieve an interpretative understanding of the documents and for effective data analysis, I read through the GbCF, PWDGs, and NS to identify codes that reflected the fitness-for-purpose domains identified in the interview phase, these were merged with the study findings to form a local-global standard composite. The BMAS (standards and curricula) was provided and an updated copy obtained from the National Universities Commission when it became available. Other documents were accessed from the FIP website. I read and reread the documents and employed constant comparative methods to identify central recurring themes and motifs. I went about this by first unitizing (Lincoln and Guba, 1985) the data, identifying specific points in the narratives that match with identified fitness-for-purpose domains and tagging them with stick-on liners, at the same time noting any new ones. Table 2.5 below shows an example of unitizing the document (a unit is the smallest piece of information about something that can stand by itself) (Wickens, 2011). Then I transferred the information into NVivo as codes in order to better organize and manage the data. I categorized the units based on identified key domains from stakeholder interviews. I used a modified double entry journal (Vacca and Vacca, 2005) strategy to categorize the units. A third column was added at the right end for notes. It served as a self-reflexive heuristic (Mason, 2002) facilitating interpretive connections between units and domains for education fitness-for-purpose.

Table 2.5: Categorization of documentary units (Schrier, 2012)

Thematic Category	Documentary Units	Notes

Therefore, the double entry journal served as an analysis tool for organizing data units into categories and finally into themes. The steps undertaken were those by Schrier (2012) who defined qualitative content analysis as a method for systematically describing the meaning of qualitative material. This is done by classifying material as instances in the categories of a coding frame. These steps include:

1. **Deciding on a research question**- the aim of study was to engage with stakeholders to identify domains for a fit-for-purpose workforce development that would meet societal healthcare needs and thereby improve the country's health status. This phase of the study aimed to determine if the identified domains for needs-based workforce

development (encompassing both local and global standards) were reflected in the BMAS.

2. **Selecting the material**- The objective of the study specified the required material which were the BMAS, Study findings, GbCF, PWDGs, and NS. However, each document was read and re-read thoroughly to establish its relevance.
3. **Building a coding frame**- In accordance with this stepwise approach, a composite coding frame indicating important domains that a fit-for-purpose programme should possess was built from stakeholder responses as well as global standard documents. Initial codes were derived from previous thematic analysis of interview data and these were checked against codes from global recommendations to avoid repetition. A total of 55 initial codes were derived which became 78 at the end of frame development, and these were organized by domains. This can be found in chapter 6.
4. **Dividing the material into units of coding**- The published BMAS document was already divided into sections and subsections, as were the other documents. These were retained as units of coding for the purpose of this study. For example, domain 5, sub-domains 5.1, 5.2 etc (see table 2.6). This system of numbering was maintained in a way that a code represents a unit of description of a standard within each document.

Table 2.6: An excerpt from the NS document showing already sectioned units (FIP, 2017)

Cluster 5:	Experiential Education
Description on the cluster:	*Experiential education programmes are where students incrementally develop their pharmacy practice and science skills in a wide variety of real-life settings.*
5.1	Experiential education should foster development of critical thinking and problem solving processes relative to drug discovery and medicines use.
5.2	Students should have the opportunity to reflect on the clinical learning experience through patient case presentations, and development and discussions of patient notes/pharmaceutical care plans.

The curriculum section of the BMAS was not pre-numbered this way so it was divided into six parts, each part represented a year of study in the 6-year PharmD programme. These parts were further segmented into units representing a course of study in each year. So, the first course in the first year would be denoted as 1.1, while the tenth course in the fifth year would be 5.10 and so on. This was used to map out the course objectives and competencies that matched the descriptors of the key domains. Hence each document had its own specific units of coding.

5. **Trying out the coding frame**- The coding frame was tested by mapping the coding units in the BMAS document to the coding frame. Every unit was matched to a code in the frame. For example, in the BMAS if the first unit of the curriculum 1.1 matched a descriptor described in domain 2 of the coding frame it was matched to domain 2. In a few cases, coding units were assigned more than one domain.
6. **Evaluating and modifying the coding frame**- The coding frame was evaluated and adjusted, in most cases expanded to accommodate the scope of descriptors in the coding units. Any descriptor that could not be matched to a coding frame domain was given a new domain outside of the coding frame domains, and any code in the coding frame that failed to match any of the coding units was described as an empty code.
7. **Conducting the main analysis**- The analysis was conducted using the NVivo software and the procedure was as described above.
8. **Interpreting and presenting the findings**- The final coding units and corresponding domain codes were then matched and categorized to form a narrative around fit-for-purpose education. The results can be found in chapter 5.

The steps in the QCA process can be seen in figure 2.8 below, and these steps describe how data was analysed in this phase of the study.

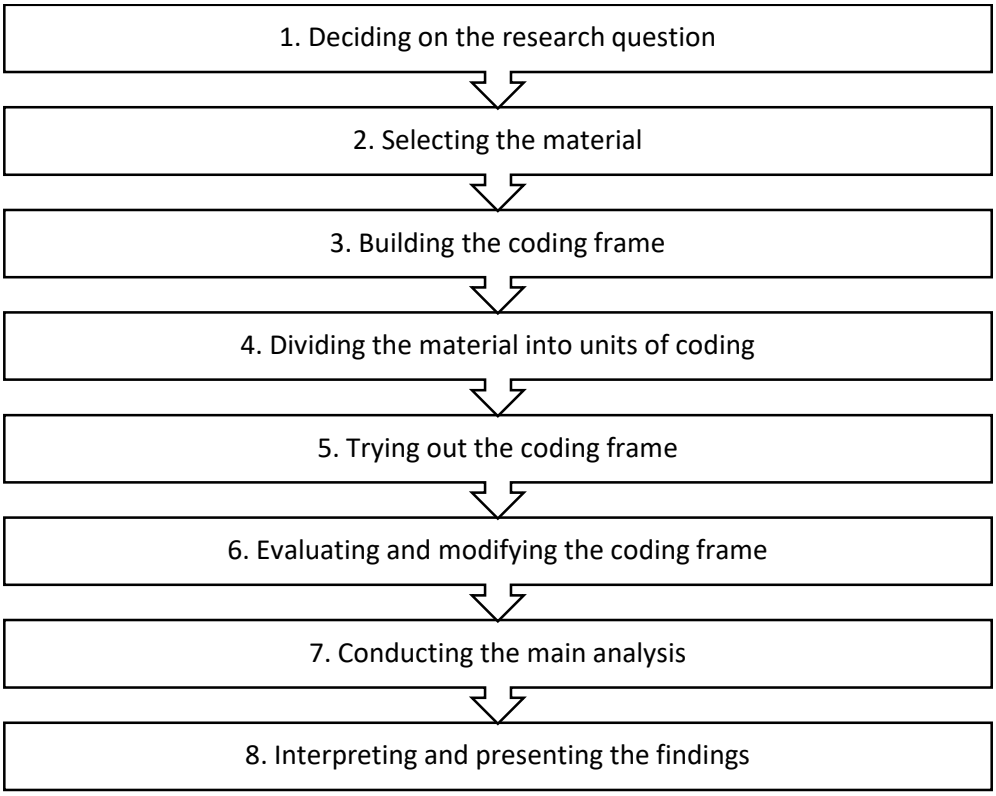

Figure 2.8: Documentary analysis process for this study

Summarily, documentary analysis is an efficient and effective way of collecting data because documents are manageable and practical resources, accessible, reliable, and non-reactive in the sense that they can be read and re-read several times and remain unchanged by the research process or researcher influence (Bowen, 2009). In this study it served as a complement to other methods, strengthening the research. However, considering these documents were not created with research agenda, investigative skills were necessary to obtain required information. The updated BMAS was also quite difficult to access.

2.7 Research Subjectivities

Understanding that my background, perspective, and position will shape my entire research and the framing and communication of results (Malterud, 2001), and that my beliefs and values are particularly important in qualitative research where I am seen as the human research instrument (Mechanic, 1989), I have attended to the context of knowledge construction at every stage of the research. I have done this by being aware of preconceptions and positionality, keeping a reflexive journal and carefully reporting how these preconceptions may have come into play during the research process.

Reflexivity is an attitude of attending systematically to the context of knowledge co-construction, especially to the effect of the researcher at every step of the research process. Understanding that a researcher's background and position will affect what they choose to investigate, the angle of investigation methods judged most adequate, findings considered most appropriate, and communication of conclusions, a researcher must be reflexive (Cohen and Crabtree, 2006).

It is an important dimension of qualitative research (Hammersley and Atkinson, 1995), researchers are obliged to clearly state how research findings may have been shaped by interactions that may have occurred among themselves, methodologies, settings, and participants (Denzin and Lincoln, 1988). This is in contrast to the quantitative research stance where efforts are directed to minimizing or eradicating the researcher effect on research (Murphy et al., 1998). Hence, there is no clear consensus as to how research subjectivity should be handled in the context of a pragmatic mixed methods research, while some suggest that subjectivity ought to be kept to the barest minimum in qualitative research, others argue that drawing on one's previous experiences will lead to a better understanding of the subject in question (Drapeau, 2002). I believe that nothing can be achieved without subjectivity and hence lean toward the latter school of thought. The concept of objectivity is in my opinion also subjective. All knowledge is relative to the knower hence self-reflection and acknowledgement of subjectivity is advised (Le Vasseur, 2003) to avoid potential bias that may arise due to proximity between the researcher and the researched.

I describe research subjectivities in two parts, how my background, experience, identity, and perspectives have shaped the research and how the research participants perceived my identity and positionality and how this may have influenced their responses.

Being a Nigerian, Pharmacist and educator myself who studied pharmacy in Nigeria, I am conscious of my preconceived ideas of pharmacy workforce development and how these may have shaped my understanding of the research question and findings from the research, considering that this was also the motivating factor behind the research topic. My interest in the research area was largely influenced by my personal experience of a knowledge and skills gap in practice after graduating from pharmacy school. This may have led me to look for gaps and shortfalls in the system that I believe already exist. These thoughts were continually captured in the reflexive journal and closely examined against the reality of participants responses. This was also mitigated by questions that asked both about facilitators and barriers in every case.

Participants were interviewed from all geopolitical zones in the country, Nigeria being a very large and culturally diverse country, context would be required to gain a deep understanding of responses provided. I am from the South-East, was born and brought up in the South-West, and have lived for a few years in the South-South therefore I am less exposed to the North as to the south which may have influenced my understanding of the individual and group interviews conducted in the North. It was therefore important that I asked as many questions as I could to understand context.

My research was conducted in my country of origin Nigeria with participants of the same broad culture, language and profession. Although sharing a common language implies significant agreements on words, nuances, and linguistics for dialogue, this cannot be relied upon to identify a single, correct interpretation (Bjork Bramberg and Dahlberg, 2013), perhaps because no single, correct interpretation of any text is ever possible. While this shared language and culture allowed me to understand much of what was being conveyed, I realise that interviewing fellow pharmacy educators of similar culture may have led to certain assumptions on their part of my supposed pre-knowledge of the system and how it works, leading to them deliberately omitting “obvious” information.

My PhD tuition is paid, and research partly funded by the Niger Delta Development Commission, a governmental agency in Nigeria focused on development of the oil producing states of the country, hence there was no conflict of interest with pharmacy education. Hence, this funding has not influenced my data or reporting of results in any way. My research is theoretically linked to and conducted in collaboration with the FIP workforce development arm, a collaboration that developed along the way of the

research. There has been no pecuniary or financial benefit to this collaboration. Though I find myself intrinsically linked to the workforce development discourse there is no politically driven or potentially questionable agenda behind this.

Reflexivity was maintained throughout the research. Self-reflective attempts to bracket existing theories and my own values enabled me to understand and represent participants' experiences and responses more adequately than would be otherwise possible (Elliot et al., 1999). While self-reflection has been described briefly in these paragraphs, the practice was a continuous one as is evident in the steps taken to ensure research quality, rigor and trustworthiness.

2.8 Research Quality, Rigor and Trustworthiness

In research, regardless of methodology employed, choices have to be made at every stage, from the selection of research questions to the analysis and interpretation of data. There is no perfect choice, as often whatever choice is made involves trade-offs given fixed resources, and has implications for the design, ethics, and conduct of research, which affect the validity of findings and conclusions, hence research rigor and trustworthiness. Understanding that everyday practice, policy, and clinical decisions are often based on research, I have ensured that research is of good quality and that choices with minimal potential threats on validity have been chosen. Where this was impossible, I have acknowledged these weaknesses in validity and reliability below, thereby anticipating critique to make for more compelling and acceptable research. Ultimately, I have ensured that these decisions have not negatively impacted on research quality to an extent that the findings are not useful, or conclusions drawn are erroneous.

Mixed methods research should not be considered inherently valid (Bazeley, 2004), but a distinct advantage of the mixed methods approach is that it increases research rigor or trustworthiness if conducted appropriately. Though criteria used to assess rigor and validity differ for both quantitative and qualitative research respectively (Hancock, 2002), key elements of quality for both methods have been incorporated into this study (Creswell, 2014) and various strategies have been deployed to maximize rigor and trustworthiness throughout the entire research process. Already having some background knowledge, and using intensive methods such as audio recorded interviews and focus groups (Knoblauch, 2005; Morse and Richards, 2002) to obtain information from participants with specific knowledge (Higginbottom, Pillay and Boadu, 2013) also helped to ensure rigour.

The quality indicators for quantitative research rigor include validity, reliability and objectivity. Validity reflects the extent to which a measure actually represents what it claims to measure, it has four major domains which have all been considered while carrying out this study: internal validity, external

validity, construct validity, and analytical validity. Internal validity refers to the extent to which a piece of evidence supports a claim about cause and effect. Though causation was not a direct objective of this study, rather description and explanation, threats to internal validity were avoided. Sample was randomly selected to ensure conditional independence, selection bias (King et al., 1994) was avoided by employing the stratified random selection technique to ensure that pharmacists in every sector of practice and geopolitical zone had a chance of being represented thereby ensuring unit homogeneity (King et al., 1994). Maturation (Cronbach, 1982) was not a threat in this study being a cross-sectional study where samples were observed once and not over a long period of time. Considering that the measuring instrument in this phase was a survey questionnaire there is practically no risk of instrumentation change (Shadish et al., 2002), participants however may have interpreted the questions differently. Conducting a pilot survey and reviewing questions based on findings from the pilot largely minimized this risk.

Analytical validity which refers to the extent to which the test used can predict the absence or presence of a change was ensured by using the right measure of central tendency to avoid fractions or decimals when reporting motives, barriers (How does someone have half a motive or 0.9% motive?). Descriptive statistics was used to show the differences in perceptions across pharmacists practising in different geopolitical zones within different practice sectors. Considering that the questions asked in the questionnaire required responses in scales, there is a possibility of level of measurement assumption threat where one participant's response of 'strongly agree' may actually be weaker than an 'agree' by another participant. This is a study weakness that has been acknowledged. Cases of non-response are often unavoidable, but responses have been mapped to sample data (see table 2.2 showing stratification done for survey sampling), and similar percentages indicate that non-response bias was highly minimized.

Construct validity is the extent to which a study measures what it set out to measure. The constructs in this research which include perceptions of needs-based education, variation by geopolitical zones, sector of practice, and other sociodemographic characteristics as well as barriers and facilitators to its implementation have been explored both qualitatively and quantitatively. Threats to validity brought about by double participation in the survey were avoided by ensuring by design that participants could only complete the survey once. The mixed methods approach inherently cancels out the mono-method bias since constructs can be operationalized in different ways. For cross-sectional studies there is a need to standardize observations, how do you standardize observations with a human-crafted instrument "measuring" humans? (Xu and Storr, 2012). This is the case with the survey method, there are many confounding variables that may affect results. Humans are generally unpredictable and total objectivity cannot be guaranteed. If for the sake of

argument, we assume the crafted questionnaire were totally objective, the participants would respond differently to this objective instrument, hence that homogeneity or standardization cannot be fully attained.

External validity is a measure of the relevance of findings from the study to other studies, cases, times and contexts (Shadish et al., 2002). Though it cannot be expressed in a coefficient it ensures that findings from a study are generalizable. Considering that the aspiration of any empirical study is inference and generalizability (King et al., 1994), external validity must be ensured. As with this study, generalization may not rely on statistical tests but on similar type cases. “If it works here, it should work there”. For this statement to hold true, research must be thorough and representative of Nigeria itself. This was one of the major purposes of the subsequent quantitative phase. Reliability describes the extent to which findings are stable and consistent, while objectivity indicates to what extent the measuring instrument is free from researcher bias. These have been touched on while discussing the domains of validity.

In all qualitative studies, the degree to which assertions are supported by convincing evidence must be evaluated (Anderson, 2010), reproducibility of findings and the extent to which findings truly represent what they intend to must be proven. This has been done in this study by using relevant quotes from the qualitative phase to support statements made. The integrity and trustworthiness of a qualitative study is established by the exploration of four domains: credibility, dependability, confirmability/authenticity and transferability (Lincoln and Guba, 1985).

Credibility reflects confidence in the findings. A possible threat to credibility in this study was interviewer bias where responses were likely to be different just because of the presence of the interviewer, or the interviewer interpreting responses based on his/her own understanding which may not be what the participant really said. This was minimized by member checking, sending interpretation of findings back to participants to verify researcher’s understanding, which was done after transcribing and changes made by participants were adopted. Credibility has also been promoted by proper engagement in the field during interviews, peer debriefing (discussing data with critical colleagues) with supervisors, proper analysis of negative cases, and triangulation (using multiple sources to verify data) of both qualitative and quantitative data (Cohen and Crabtree, 2006).

Dependability refers to the stability or repeatability of the research process. A threat to dependability in this research may be instrumentation where the characteristics of the measuring instrument may change overtime making resulting measurements incomparable (Shadish et al., 2002). This is worse with a ‘human instrument’ which is always the case in a qualitative study (Xu and Storr, 2012). To ensure dependability of this study, a researcher not

involved in the research process examined both the process and product of the research study. The purpose of this was to evaluate the accuracy and evaluate whether or not the findings, interpretations and conclusions were supported by the data. This provided an opportunity to summarize preliminary findings, assess adequacy of data and preliminary results, and led to the development of stronger and better articulated findings.

Confirmability is a measure of relative neutrality and involves minimizing the researcher's subjective influence on the research and has been improved in this study by reflexivity and describing the methods in detail. This is similar to authenticity which refers to the extent to which participants' experiences have been objectively reported.

Transferability describes the extent to which findings can be applied in other contexts and has been enhanced in this study by using rich in-depth descriptions (Lincoln and Guba, 1985). By describing a phenomenon in sufficient detail, one can begin to evaluate the extent to which the conclusions drawn are transferable to other times, settings, situations and people. Reactivity being a threat to transferability of this research could not be totally avoided considering that some part of this research was based on self-reports (Shadish et al., 2002). People often do not report on themselves in an objective manner, they tend to produce reactive self-reports (Kaplan, 1964). There may also be reactions to perceived researcher expectations. One of the questions in the qualitative interview guide was "What are your thoughts and opinions of pharmacy education in Nigeria?" Considering that I am a pharmacy educator, participants may feel obliged to make positive comments that they don't necessarily think to be true. This bias may not be pronounced in the context of the Nigerian culture because there is a cultural tendency to speak up on things that are not quite right regardless.

This study has given due attention to ensure that elements of rigor and validity were incorporated into all phases and stages of the research process by ensuring the research design was specified from the onset. The sampling approaches for both quantitative (stratified random sampling) and qualitative (purposive sampling) phases were stated, the number of participants in each phase also specified, instruments to collect data (survey for quantitative, focus groups and interview for qualitative) as well as types of data to be collected (questionnaire responses for quantitative and audio recordings for the qualitative), organization and cleaning of data was done prior to data analysis and the analysis procedures were clearly described and free from ambiguity. Approaches to establish validity and reliability of data were also described.

2.9 Data Management and Ethical Considerations

Ethical approval was sought and granted by the School of Education ethics committee (Ref number 2017/112) on the 23rd January 2018 at the University

of Nottingham because the research was primarily educational and there was no potential risk to patients and the public. Ethical clearance was also sought from the Ministry of Health (MoH) through the Pharmacists Council of Nigeria (PCN) for this study. Both ethics approval forms are attached at appendix 7. Informed consent was obtained from all participants. Emails were sent, information provided, and signatures obtained at the start of group sessions. Confidentiality was maintained throughout the study and data stored in a secure location. In accordance with the University of Nottingham's Code of Research Conduct and Ethics, a lone working policy was set up in liaison with the School of Pharmacy's Health and Safety Officer who has a policy system dedicated for researchers planning to conduct their fieldwork abroad.

3 Chapter 3: Education Capacity

3.1 Chapter Introduction

The first objective of this research project was to determine the current status of pharmacy workforce development in Nigeria. To provide a contextualized understanding of perceived standard domains as well as identified workforce development 'needs' (defined in this study as the gap between what exists and what is expected). This objective has been met in this and the next two chapters which each address one of three major themes identified as fitness-for-purpose domains for Nigerian pharmacy workforce development by identifying descriptors through an exploration of stakeholders' qualitative and quantitative responses. Three major themes discussed in this thesis are: education capacity, professional relevance, and systems efficiency. Barriers and facilitators to their actualization were also discussed in these chapters.

Education capacity was the first, and most dominant theme identified while stakeholders discussed workforce development standards in Nigeria. Capacity is a term frequently used by development agencies and has been defined by UNDP as a process through which institutions or individuals obtain, strengthen and maintain capabilities to set and achieve certain goals (UNDP, 2008). In a similar pattern to this research, a review of research articles indexed in PubMed over many years, all addressing workforce training and development issues, revealed a major focus on educational measurement and assessment (WHO, 2006) (see figure 3.1 below).

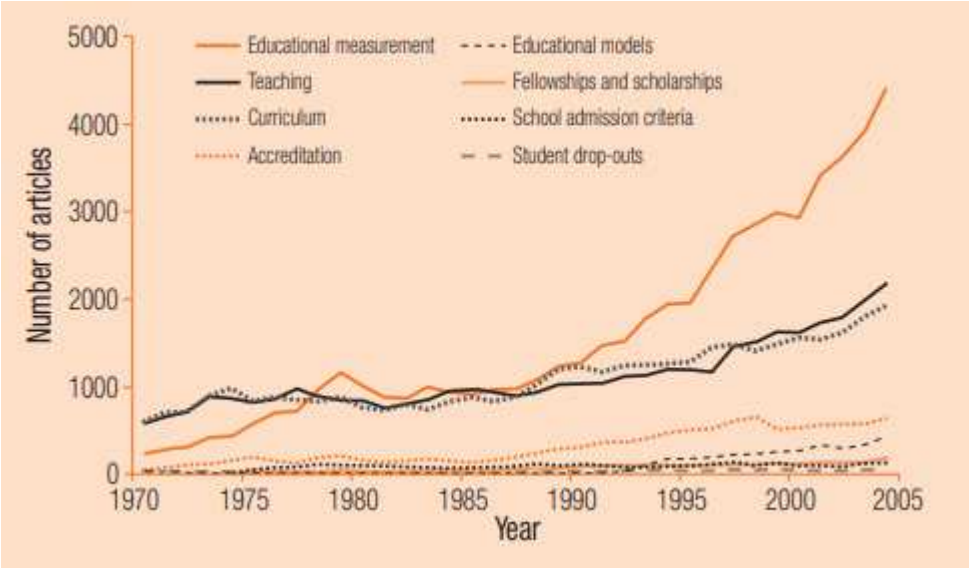

Figure 3.1: Research articles on topics addressing health workforce training (WHO, 2006)

Nigerian pharmacy stakeholders described education capacity as a measure of compliance with global and local quality requirements, and an ability to

prepare pharmacists with international competencies, who are able to undertake patient-focused practice within country of study, as well as other countries with minimal additional training due to differences in context. According to stakeholders, education capacity was mainly defined in terms of institutional capability (programme, curriculum), human competence (staff training, student engagement and employability) and infrastructural adequacy (learning environment, up-to-date facilities and equipment). Academic participants measured education capacity by comparing to other pharmacy schools or by graduates' ability to excel in conversion examinations abroad, while employers and those in other sectors of practice measured this by graduates' competencies, time span from graduation to independent practice, the ability to apply personal education gained to current practice experiences. Most stakeholders agreed that capacity was also determined by the extent to which education could overcome challenges reported. All these influenced the quality of pharmacy graduates produced.

Table 3.1: Illustrative quote representation

Acronym	Meaning
I	Individual Interview Participant
FG	Focus Group Participant
Geopolitical Zones Where Universities Are Located or Focus Groups Conducted	
NW	North West
NE	North East
NC	North Central
SE	South East
SS	South South
SW	South West

Results are presented using illustrative quotes attributed to different stakeholders as shown in table 3.1 above. and figure 3.2 shows the chapter structure.

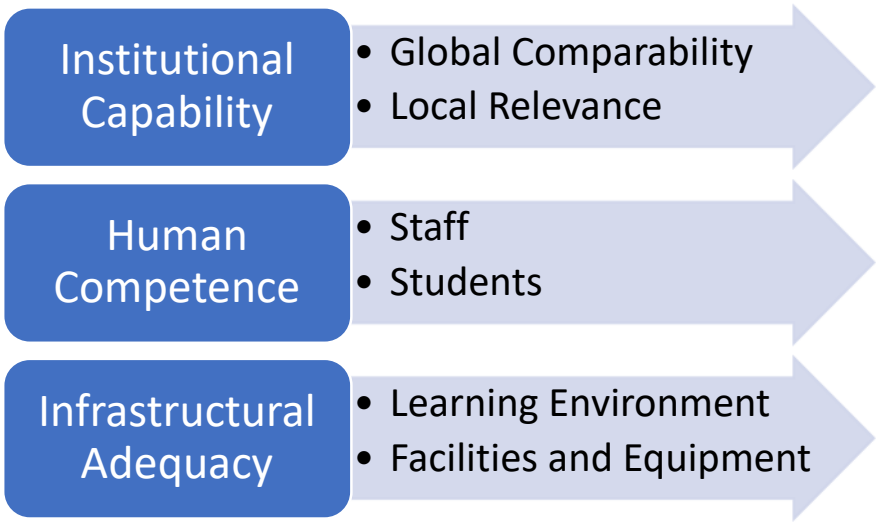

Figure 3.2: Chapter structure

3.2 Pharmacists Overview

There are 25,138 registered pharmacists in Nigeria, according to the PCN 2019 register with 13,457 (53.5%) licensed to practice pharmacy. Results presented in the next three chapters are based on responses from individual (N=23) and group interviews (N=55) with stakeholders representing all six geopolitical zones and across various sectors of pharmaceutical practice including students, followed by an online national survey of a stratified random sample of pharmacists (N= 1291) across the country.

3.3 Demographics

1,291 pharmacists responded of 3,740 surveyed (34%response rate). Respondent demographics (N=1291) is shown in table 3.2, while the frequency table for education capacity variables are shown in table 3.3.

Table 3.2: Respondent demographics

Variable Category	Group	Frequency (N)	Percentage (%)
Gender	Male	729	57.9
	Female	522	41.4
	Prefer not to say	9	0.7
Age (Years)	18-24	21	1.7
	25-34	654	51.7
	35-44	309	24.4
	45-54	196	15.5
	55-64	75	5.9
	65 or older	10	0.8
University Attended	UniMaid	61	4.8
	UniJos	149	11.8
	Unllorin	2	0.2
	ABU	223	17.6
	UDUS	11	0.9
	UNN	153	12.1
	NAU	27	2.1
	UniUyo	39	3.1
	UniBen	119	9.4
	Igbenedion	16	1.3
	UniPort	13	1.0
	Madonna	31	2.5
	DELSU	27	2.1
	NDU	20	1.6
	UI	74	5.8
	UniLag	85	6.7
	OAU	135	10.7
	OOU	60	4.7
	Outside Nigeria	20	1.6
Highest Degree Completed	Bachelor's Degree (BSc/BPharm)	751	59.2
	Master's Degree (MSc/MPharm/MBA/WAPCP)	379	29.9
	Doctor of Pharmacy (PharmD)	92	7.2
	Doctor or Philosophy (PhD)	47	3.7

Sector of Practice	Hospital practice	452	35.7
	Community practice	492	38.9
	Industrial Practice	79	6.2
	Academia/Research	120	9.5
	Administrative/Regulatory/Ministry	81	6.4
	Sales and Marketing	114	9.0
	Global Health/Public Health/NGO	144	11.4
	Other (Pharmacy)	21	1.7
	Non-pharmacy	36	2.8
	Outside Nigeria	32	2.5
Workplace Position	Trainee/Student	66	5.3
	Staff	576	45.9
	Manager	337	26.9
	Director	174	13.9
	CEO	102	8.1
Number of Years of Practice	0-5 years	509	40.1
	6-10 years	341	26.9
	11-20 years	233	18.4
	21-30 years	113	8.9
	31-40 years	69	5.4
	More than 40 years	3	0.2
Geopolitical Zone of Origin	North Central	244	19.3
	North East	81	6.4
	North West	88	7.0
	South South	231	18.3
	South East	279	22.1
	South West	341	27.0
Geopolitical Zone of Practice	North Central	288	23.0
	North East	82	6.5
	North West	128	10.2
	South South	188	15.0
	South East	87	6.9
	South West	479	38.3

Table 3.3 Frequency table for education capacity variables

Key for tables below: SA- Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree, N-Count.

S/N	Variable		SA	A	N	D	SD
		Rank Value	1	2	3	4	5
1.	My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world.	N	366	537	158	169	32
		N %	29.0	42.6	12.5	13.4	2.5
		Median Rank	2				
		Lower Quartile	1				
		Upper Quartile	3				
2.	Course-appropriate teaching techniques, employing information technology are now used in classrooms by pharmacy educators.	N	111	412	368	300	66
		N %	8.8	32.8	29.3	23.9	5.3
		Median Rank	3				
		Lower Quartile	2				
		Upper Quartile	4				
3.	A PhD degree alone provides lecturers with requisite skills to teach undergraduate pharmacy courses.	N	93	251	251	513	151
		N %	7.4	19.9	19.9	40.7	12.0
		Median Rank	4				
		Lower Quartile	2				
		Upper Quartile	4				
4.	The school environment for pharmacy students is comfortable, inspiring, and conducive for study.	N	79	289	251	457	188
		N %	6.3	22.9	19.9	36.2	14.9
		Median Rank	4				
		Lower Quartile	2				
		Upper Quartile	4				

5.	Learning facilities and equipment during my undergraduate training were up to date with practice standards.	N	73	264	193	511	222
		N %	5.8	20.9	15.3	40.5	17.6
		Median Rank	4				
		Lower Quartile	2				
		Upper Quartile	4				
6.	Lecturers' teaching notes and other teaching materials are regularly updated to ensure information provided is up to date and supports future developments	N	77	313	320	402	151
		N%	6.1	24.8	25.3	31.8	12.0
		Median Rank	3				
		Lower Quartile	2				
		Upper Quartile	4				
7.	Written assessments in pharmacy school usually require students to reproduce lecture notes rather than apply taught concepts.	N	346	549	137	188	45
		N %	27.4	43.4	10.8	14.9	3.6
		Median Rank	2				
		Lower quartile	1				
		Upper Quartile	3				
8.	Student evaluation of teaching is a useful index for promotion of lecturers.	N	379	405	198	163	111
		N %	30.2	32.2	15.8	13.0	8.8
		Median Rank	2				
		Lower Quartile	1				
		Upper Quartile	3				
9.	Pharmacy students will benefit from being mentored by experienced practising pharmacists.	N	933	290	25	11	4
		N %	73.9	23.0	2.0	0.9	0.3
		Median Rank	1				
		Lower Quartile	1				
		Upper Quartile	2				

10.	Interviewing orally before admission into pharmacy school to ascertain possession of desirable character traits will minimize school dropouts	N	302	337	302	234	89
		N%	23.9	26.7	23.9	18.5	7.0
		Median Rank	2				
		Lower Quartile	2				
		Upper Quartile	4				
11.	The undergraduate programme gives sufficient opportunity for applying scientific classroom knowledge and taught concepts in hospitals and other simulated real-life settings.	N	101	427	232	399	101
		N %	8.0	33.9	18.4	31.7	8.0
		Median Rank	3				
		Lower Quartile	2				
		Upper Quartile	4				
12.	Past experience, along with ongoing practice exposure in main areas of teaching and research, is necessary for educators to remain relevant in their field of expertise.	N	777	424	43	9	8
		N %	61.6	33.6	3.4	0.7	0.6
		Median Rank	1				
		Lower Quartile	1				
		Upper Quartile	2				
13.	High work pressure due to heavy workload made worse by workforce shortage has negatively impacted pharmacy educator's productivity	N	547	504	124	69	15
		N%	43.4	40.0	9.8	5.5	1.2
		Median Rank	2				
		Lower Quartile	1				
		Upper Quartile	2				
14.	The geographical maldistribution of pharmacists can be addressed by providing incentives to students who school in rural and semi-rural areas to practice in same areas after graduation	N	531	498	131	75	25
		N%	42.1	39.5	10.4	6.0	2.0
		Median Rank	2				
		Lower Quartile	1				
		Upper Quartile	2				

15.	Country Specific healthcare needs are prioritized in the Nigerian pharmacy undergraduate programme	N	80	293	296	424	171
		N%	6.3	23.2	23.4	33.5	13.5
		Median Rank	3				
		Lower Quartile	2				
		Upper Quartile	4				
16.	National accreditation standards are equitably applied across all pharmacy schools without prejudice.	N	190	434	384	186	60
		N %	15.2	34.6	30.6	14.8	4.8
		Median Rank	3				
		Lower Quartile	2				
		Upper Quartile	3				
17.	The recently introduced pre-registration examination is a good way to standardize graduate quality across schools.	N	287	439	195	186	150
		N %	22.8	34.9	15.5	14.8	11.9
		Median Rank	2				
		Lower Quartile	2				
		Upper Quartile	4				
18.	The curriculum should be uniform across the country, with no university variations in courses, to ensure pharmacy graduates are of similar quality.	N	837	355	37	25	5
		N %	66.5	28.2	2.9	2.0	0.4
		Median Rank	1				
		Lower Quartile	1				
		Upper Quartile	2				

Table 3.4: Coding Frame from Qualitative Phase of Study

Chapters	Major Themes	Sub-Themes	Codes	Descriptors
Chapter 3	Education Capacity	Institutional Capability (Programme, Admission, Curriculum, Experiential training, Pedagogies, Competencies, Quality Assurance, Assessment)	Global Comparability Local Relevance	Comparing standards with pharmacy education abroad Comparing with others rather than with standards
		Human Competence (Student Support, Staff training)	Staff Students	
		Infrastructural Adequacy	Learning Environment Facilities and Equipment	Poor funding, poor maintenance
Chapter 4	Professional Relevance	Practice Environment	Unmet Expectations Underutilization of Pharmacists Interprofessional Discord	
		Policy Issues	Charlatans in practice Widely varying societal perceptions Weak and prohibitive policies Support for professional development	Chaotic drug distribution, poor professional regulation, role ambiguity, lack of postgraduation specialization pathways
Chapter 5	Systems Efficiency	The Pharm D Switch Motivators	Keeping up with global trends	Collaborative patient focused practice

			Clinical Practice Dynamics	
			Self-Actualization	
		Barriers	Education-Practice Gap	Curricular mismatch yet overload
			Perceived detriment of switch	Ignorance of switch among pharmacists
			Poor clinical training capacity	
			Medical Doctors Resistance	Interprofessional discord
			Curricular Overload	
			National Inequities	Tribalism, geopolitical favouritism
			Others	
		Facilitators	Home Grown PharmD	Incorporating all sectors
			Foreign Collaboration	
			Student's Interest	
			Doctor Title	

Table 3.4 above shows the thematic map for the qualitative phase of this study. These form the basis for the narratives discussed from this chapter through to chapter 5. How codes were extracted from qualitative responses of stakeholders has been extensively discussed in chapter 2.

3.4 Institutional Capability

In practice, when institutional capability is evaluated, several metrics can be assessed (Fry et al., 2003; Harvey and Knight, 1996), and often involves the fulfilment of specific stated outcomes which are pre-defined (Campbell and Rosynai, 2002). Interviews with stakeholders revealed what these specific pre-defined outcomes are in the Nigerian pharmacy context. 'Institution' in this study was defined as pharmacy schools, their all-encompassing structure, and programmes of learning. Most stakeholders in education and regulation leadership described institutional capability as a measure of global comparability, programme similarity to reference countries, and compared standards among pharmacy schools within the country rather than evaluate their ability to meet global and national standards. These views were not shared by those in practice and employers who prioritized local relevance of the programme.

3.4.1 Global Comparability: Prioritized Global Compliance

Global compliance has always been a priority for the development of the Nigerian pharmacy programmes, and has informed programme changes over the past decades (Ogaji and Ojabo, 2014; Awaisu, Mohammed and Yakubu, 2016), from a diploma to a Bachelors (BPharm) and most recently to a Doctor in pharmacy programme (PharmD) (Ikhile and Chijioke-Nwauche, 2016). This focus on global comparability of the programme as well as international competence of pharmacy graduates is potentially beneficial, however, this study showed that this may have been done to the detriment of local relevance.

A tendency to prioritize global and international standards and keep pace with educational developments in HICs is a widely documented issue in the LMIC context (Ghilzai, 2009; Ghani, Gillani and Ghani, 2010; Hadi, 2010; Duweijua et al., 2004; Jamshed, Babar and Masood, 2007; Asiri, 2010) and has been identified as the reason for the extensively researched misalignment of education programmes with societal healthcare needs due to stark differences in context (Jamshed, Babar and Masood, 2007; Babar, 2005; Hadi, 2010; Ryan et al., 2008). Having incorporated an American curriculum into the already existent British curriculum (Ikhile and Chijioke-Nwauche, 2016) to yield a pseudo British- American curriculum with components from Canada and Australia also, the pharmacy undergraduate programme in Nigeria, despite not satisfactorily meeting local needs, was lauded by participants in education and regulatory leadership as a world-class programme.

Okoroma (2006) argued that this British-American combination has not helped education development in Nigeria. On one hand, the British system that helped maintain traditional values and a healthy society has been lost, on the other, the American system with its potential for technological growth has failed to make a difference because of the level of development of Nigeria,

leaving the worst of both systems. This notwithstanding, stakeholders in education leadership recounted experiences of Nigerian-trained pharmacists who had emigrated to other countries and succeeded at the conversion exams at first attempt, in addition to being ranked among the top performers globally (Alkhateeb et al., 2010) in the United States of America. In a similar pattern, stakeholders in regulatory leadership insinuated that pharmacy programmes were subjected periodically to rigorous quality checks by appropriate regulatory organizations for this reason.

"We want to keep up with international standards that is why our products are highly reliable. As you may be aware, graduates of Nigerian Universities in pharmacy are the third highest supplier to the US and 70% of the Nigerian graduates pass their conversion exams in US at the first sitting. All these are testimonies of the reliability and quality of our pharmacy training in Nigeria, and it is because we subject the program to all these processes to guarantee the quality of the program" (Director in Regulatory Organisation).

The comparability to pharmacy programmes in other countries was corroborated by pharmacists' responses in the subsequent quantitative phase. A majority of pharmacists agreed or strongly agreed (71.6%) that their undergraduate degree prepared them to compete effectively with pharmacists trained in other countries of the world. Only 15.9% disagreed or strongly disagreed. A median rank value of 2 indicated that most stakeholders agreed to this statement.

Participants in the North east were most likely to agree or strongly agree (86.4%) and least likely to disagree or strongly disagree(8.7%) to the global comparability of the Nigerian pharmacy programme while those in the South West were least likely to agree (66.6%), and most likely (20.5%) to disagree to that statement.

When these results were analysed a chi-square test of independence was performed to examine the relation between geopolitical zone and responses to the global compliance variable (see table 3.5). Stakeholder responses to the global compliance variable differed by geopolitical zones of practice. The relationship between these variables was significant. X^2 (20, N=1241) = 52.26, p< .001.

This may indicate geopolitical variations in the standard and focus of pharmacy education despite curricular harmonization. It is also probably because participants who practice in the North East tend to be more conservative culturally, and less critical of programmes than the South West where people are more outspoken.

Table 3.5: Global compliance variable crosstabulation with Geopolitical zones of practice

Geopolitical zone of practice * My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world. Crosstabulation							
% within Geopolitical zone of practice							
		My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world.					Total
		SA	A	N	D	SD	
		N%	N%	N%	N%	N%	
Geopolitical zones of practice	North Central	26.2	45.1	13.6	12.9	2.1	100.0
	North East	40.7	45.7	4.9	6.2	2.5	100.0
	North West	41.3	39.7	10.3	8.7	0.0	100.0
	South South	37.7	35.0	14.8	10.9	1.6	100.0
	South East	32.2	41.4	8.0	13.8	4.6	100.0
	South West	22.2	44.4	13.0	17.6	2.9	100.0
Total		29.3	42.5	12.2	13.6	2.3	100.0

When analysed by sector of practice, pharmacists in Ministry, regulatory and administrative sectors of practice were most likely to agree or strongly agree (79.0%) to the statement (table 3.6). This may be because they are not required to utilize core clinical skills, which was identified as a major curricular gap, in their line of work hence can confidently compete globally. While those in global health, public health and NGOs were most likely to disagree or strongly disagree (23.2%). This may be related to the insufficient coverage of locally relevant topics in the curriculum which would be further discussed in the competencies section below.

Table 3.6: Global compliance variable crosstabulation with practice sectors

		My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
Practice Sectors	Hospital Practice	30.4	40.5	13.2	13.6	2.2	100.0
	Community practice	29.3	41.8	13.9	13.3	1.6	100.0
	Industrial Practice	32.9	44.3	11.4	8.9	2.5	100.0
	Academia/ Research	31.7	43.3	11.7	9.2	4.2	100.0
	Administrative /Regulatory/ Ministry	42.0	37.0	12.3	6.2	2.5	100.0
	Sales and Marketing	18.4	50.9	12.3	14.0	4.4	100.0
	Global Health/Public Health/NGO	28.9	38.7	9.2	21.1	2.1	100.0
	Other (Pharmacy)	33.3	22.2	33.3	5.6	5.6	100.0
	Non-pharmacy	22.2	52.8	8.3	11.1	5.6	100.0
	Outside Nigeria	18.8	37.5	28.1	9.4	6.3	100.0
	Total	29.1	42.5	12.5	13.4	2.5	100.0

3.4.2 Curricular Similarity

Curricular similarity with reference countries in the global north was another descriptor identified in discussions. Though the curriculum is not the only means by which health professionals acquire knowledge, it acts as an important vehicle for evidence-based practice (WHO, 2013). Hence an important tool for education reform and catalyst for change and innovation in health systems (WHO, 2006). This may explain why the curriculum was the most widely discussed theme. Research has shown that education development in some LMICs occur by uptake of curricula (Asiri, 2010) and entire programmes (Jamshed et al., 2007; Duweijua et al., 2004) from HICs without adapting core competencies to specific localized contexts while still maintaining global standards, as recommended by Frenk et al. (2010).

Most stakeholders stated that curricular similarity with western countries was a necessary consequence of globalization. To facilitate transnational migration and for international employability of pharmacy graduates, the programme

should not differ widely across countries. Curricular similarity in itself is not a problem, and is in fact expected when context, needs and purposes are similar. However, when this is not the case as can be expected between most LMICs and HICs, resulting misalignment (Jamshed et al., 2007; Babar, 2005; Hadi, 2010 Ryan et al., 2008) may hamper the ability of graduate pharmacists to contribute meaningfully to the health status of their country. This may also lend credence to literature that describes the curriculum in LMICs as a tool for international employability (Jamshed et al., 2007, Anderson and Futter, 2009; Babar et al., 2013). In support of this, some LMICs have been reported to purposefully enable pharmacists to sit for examinations to work in the USA (Ghilzai and Dutta, 2007) post-degree, amidst severe workforce shortages, and this practice has led to a crisis. Especially considering that curricular similarity in Nigeria was actively sought with the United Kingdom, United States of America, and Canada, which were major destination countries for Nigerian pharmacist emigration (Khan-Ghilzai, 2006).

"I think we put ourselves under immense pressure to look like, feel like, sound like pharmacy in the UK, pharmacy in the US, pharmacy in Canada. But is that what we need? (SWFG participant in academic practice).

In most of these cases, the focus shifts from preparing graduates to meet societal healthcare needs to information overload for successful practice in other countries. This was confirmed in the quantitative phase as most respondents (78.4%) either agreed or strongly agreed that the curriculum focuses on providing information rather than skills required for patient focused practice. A median rank value of 2 indicated that most stakeholders agreed to this statement.

These responses were largely similar across the sectors of practice (see table 3.7), with pharmacists in other sectors and those who have left the pharmacy practice sector more likely to agree to this statement than those still in practice and within major practice sectors.

Table 3.7: Curricular relevance variable crosstabulation with practice sectors

		The BPharm curriculum focuses more on providing scientific information than on skills required for patient-focused practice.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
Practice Sectors	Hospital Practice	29.4	49.2	6.9	13.1	1.3	100.0
	Community practice	29.3	47.7	6.4	13.5	3.1	100.0
	Industrial Practice	30.4	49.4	5.1	13.9	1.3	100.0
	Academia/ Research	33.3	44.2	7.5	15.0	0.0	100.0
	Administrative /Regulatory/ Ministry	27.5	47.5	7.5	15.0	2.5	100.0
	Sales and Marketing	28.1	51.8	8.8	11.4	0.0	100.0
	Global Health/Public Health/NGO	33.6	44.1	8.4	13.3	0.7	100.0
	Other (Pharmacy)	15.0	70.0	0.0	15.0	0.0	100.0
	Non-pharmacy	19.4	55.6	11.1	11.1	2.8	100.0
	Outside Nigeria	38.7	38.7	12.9	9.7	0.0	100.0
	Total	30.6	47.8	7.2	12.6	1.8	100.0

This tendency towards western education patterns may be rooted in conventional development theory which focuses on a universalism that holds western political, economic, and academic standards as the global norm (Rapley, 2004). Nevertheless, it is now widely recognized that curricular development should always prioritize local needs, national health priorities over global views (Hadi, 2010). It should be rooted in its own locality and context and meet the needs of its own learners and population. This is the global standard recommended by FIP (FIP, 2013; Anderson et al., 2009) to ensure that pharmacists are relevant to societies requiring their services. If curricular similarity would be embraced at all costs, then countries with similar healthcare challenges and similar contexts should be considered as countries of reference. This is the practice in some HICs who learn from neighbouring countries in decision making concerning healthcare and

education. For example, Belgian policy makers, learn from France, Germany and the Netherlands (Driesen et al., 2007).

3.4.3 Curricular Coverage

Globally, the 21st century curricular trend is a shift from a focus on knowledge, skills, and attitudes to one that can train pharmacists to think, and act in a patient-centred way (Rennie et al., 2011; Noble et al., 2011) in keeping with the paradigm shift. This is generally understood by education policy makers who keep making changes to the curriculum in order to keep up with global best practice (Ogaji and Ojabo, 2014; Ikhile and Chijioke-Nwauche, 2016; Fathelrahman et al., 2016). Especially following publications that described curricula in LMICs as rigid and static (Roush et al., 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010) and unable to keep up with healthcare advances. However, these changes to the curriculum have been majorly additions without concomitant removal of obsolete content, thereby leading to an 'over bloated' curriculum as described by stakeholders which, due to the sheer enormity, cannot offer the required depth to ground students in knowledge provided.

"When pharmacy is moving, we don't pick the ones that meet our needs and leave the rest. We just pick every wave of doctrine that comes from UK, US, Canada, and Australia, and the old ones cannot leave because as a group, pharmacists are very territorial. If I say cognosy [pharmacognosy] remove this from your course, they say why are you making me less relevant? So, who suffers? The students and the country. So, we have not purpose built our programs" (Academic Pharmacist LFG).

'Territorial' was the term used to describe educators who acted and worked in silos, refusing to integrate and with a need to hold on to aspects of the curriculum deemed obsolete, repetitive or excessive by other educators. In the Nigerian pharmacy context, territorial behaviour led to an overloaded curriculum, inevitably followed by 'broad and shallow' coverage: dilution of focus and insufficient depth in treatment of subjects (WHO, 2006; Jamshidi and Cook, 2003). This phenomenon of compartmentalization among educators was described by Desselle et al. (2011) as leading to discord among faculty members from different sub-disciplines. In this study, pharmacists argued about focused versus wide curriculum, deep learning versus surface knowledge to the extent that some participants suggested that instead of the broad and non-specific curriculum pharmacy students should be allowed to specialize while in school. Others did not agree.

"Truth be told, it's not feasible to say pharmacists after the second or third year should specialize. It does not happen anywhere in the world it won't even happen here. So, it's the discipline that you go through that helps you to choose a specialization, if not you would be a scientist and be limited in your choice of practice after graduation" (Academic Pharmacist SWFG).

Quantitative findings showed most pharmacists (89.7%) agreed or strongly agreed that pharmacy graduates should be able to function optimally in all locally available pharmaceutical practice sectors before specializing. A median rank value of 2 indicated that most stakeholders agreed to this statement. Only 4.6% disagreed or strongly disagreed to this.

Evidently, the need to have flexibility to practise within all sectors is nationally perceived, and this realization was consolidated by the opinions of participants in academic leadership who had interviewed foreign-trained pharmacists during their Nigerian pharmacy orientation programme. They reported that they found these pharmacists deficient in certain areas of pharmaceutical knowledge, which was attributed to curricula which were limited in scope. They spoke proudly about the Nigerian curriculum which has a broad scope of coverage and cross-sector applicability within pharmacy practice.

"I think pharmacy education is actually very strong…very very strong…. It's all round unlike what you see in many countries, many countries lean towards clinical so they will be very strong in clinical weak in industrial, some other countries will be strong in industry and weak in the clinical area, but Nigeria has managed to maintain or to carry along all sectors of pharmaceutical science" (Dean SE University).

This need for a widely applicable curriculum may be for improved employability in as many sectors as possible due to high national unemployment rate, which could still be achieved with a less loaded curriculum, once irrelevancies are taken out (Johnson and Finucane, 2000). This must be done in order to achieve a lean curriculum, and performance assessments should focus on high order skills as can be found in high-achieving, steeply improving nations (Darling-Hammond, 2010).

3.4.4 Minimized Interschool Variation

A high degree of similarity in graduate competence across all pharmacy schools was a national goal, in concordance with the British higher education model (Ajayi, 1975) which aims to minimize or totally eradicate variation among schools (Woodhouse, 1999). Interviews with regulatory leaders revealed steps taken to ensure uniformity such as curricular harmonization and the adoption of Basic Minimum Academic Standards (BMAS) for quality assurance of schools.

"So, we created standards for all programmes for all Nigerian Universities to tell you that a graduate of history in university A is the same, as far as this standard is upheld, as a graduate in university B. This was not common practice anywhere in the world, but this is what we did, and it paid off. Some countries have even been trying to adopt this. Even in very developed countries they don't even have this method. In fact, last time

when we attended a council of higher education accreditation in US one of their lamentation was their inability to have a common standard" (Regulatory Director I).

Stakeholders expected this competence similarity, hence, there was a tendency for interschool comparison rather than against requirements or standards as is the norm with comparative efforts in literature (Hawboldt et al., 2017). Feedback from employers, school staff strength and calibre, performance at inter-school quiz competitions, post-graduation leadership positions occupied by alumni globally, performance in pharmacy conversion exams of high-income countries especially the USA and Canada, students' confidence and ability for independent practice soon after graduation, were bases for comparison. Participants when discussing schools often emphasized their unique qualities.

"I am proud of the products of my school that went through me, because we got the standard that we wanted. Even despite all the challenges around us we had one of the best crop of pharmacists graduating from that school, excellent graduates, and I'm really proud even the products of that school, even though we are very young compared to most pharmacy schools" (Dean SW University)

The standard of similarity in graduate competence across schools was nationally perceived. Findings from quantitative survey revealed a near consensus (94.7%) on the need to harmonize the curriculum across the country to ensure graduate similarity. A median rank value of 1 indicated that most stakeholders strongly agreed to this statement.

Stakeholders reported that graduate competence differed across pharmacy schools despite attempts to harmonize curricula and standardize programmes. This may be due to a failure to clearly specify required competencies (Atkinson et al., 2014) for graduates in the BMAS. A particular pharmacy school was identified for superior graduate competence by employers, going by these standards. This was confirmed by a graduate of this school who could not relate to many challenges passionately discussed by graduates of other schools. He seemed sincerely surprised, shocked even, because he had a different education experience.

"Let me speak as an employer. Products of this pharmacy school, like he said, under 1 or 2 weeks you are free to leave them… they rank number one in community practice, even in admin" (SWFG in community practice).

Quantitative results revealed that the outstanding performance by graduates of aforementioned school may have been due to a focus on local applicability of their curriculum rather than global comparability, since graduates of this school were one of the least likely to strongly agree (11.1%) that their undergraduate programme prepared them to be globally competitive.

When these results were analysed, chi-square test of independence was performed to examine the relation between university attended and responses to the global compliance variable (table 3.8). Stakeholder responses differed by university attended. Graduates from UDUS were most likely to strongly agree while those from OOU were most likely to strongly disagree to this statement. The relationship between these variables was significant. X^2 (72, N=1255) = 148.30, p< .001.

Table 3.8: Global compliance variable crosstabulation with university attended

		My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
University Attended	UniMaid	50.0	35.0	10.0	3.3	1.7	100.0
	UniJos	22.8	51.7	10.1	12.1	3.4	100.0
	UnIlorin	50.0	0.0	50.0	0.0	0.0	100.0
	ABU	34.5	41.4	11.8	10.5	1.8	100.0
	UDUS	72.7	9.1	18.2	0.0	0.0	100.0
	UNN	28.8	41.8	11.8	15.0	2.6	100.0
	NAU	51.9	29.6	14.8	3.7	0.0	100.0
	UniUyo	29.7	45.9	16.2	8.1	0.0	100.0
	UniBen	38.5	36.8	10.3	11.1	3.4	100.0
	Igbenedion	12.5	43.8	25.0	18.8	0.0	100.0
	UniPort	23.1	46.2	15.4	15.4	0.0	100.0
	Madonna	36.7	43.3	13.3	3.3	3.3	100.0
	DELSU	11.1	44.4	22.	18.5	3.7	100.0
	NDU	65.0	25.0	5.0	5.0	0.0	100.0
	UI	18.9	43.2	12.2	21.6	4.1	100.0
	UniLag	10.6	34.1	21.2	29.4	4.7	100.0
	OAU	21.5	51.9	9.6	16.3	0.7	100.0
	OOU	13.6	50.8	13.6	16.9	5.1	100.0
	Outside Nigeria	45.0	45.0	10.0	0.0	0.0	100.0
	Total	29.0	42.6	12.5	13.4	2.5	100.0

Wide variations in graduate competence were evident, despite being taught with a 'harmonized' curriculum. This emphasized the importance of less controllable factors such as curricular delivery and individual student interest and aptitude. This is not peculiar to Nigeria, as similar variation despite harmonization has also been reported in Zambia (Kalungia et al., 2019). In response to this variation, a pre-registration examination was recently introduced by PCN similar to the UK (RPS, 1992), to ensure expected minimum practice standards, amidst protests from young pharmacists who thought it unnecessary since the pharmacy programmes were already accredited. The

examination had been run successfully and participants thought it may serve as a graduate competence check since programmes and curricula were quite diverse.

"…we were able to introduce a program, preregistration exam for Pharmacists. This is something that has been on the table for a long time but literally the young pharmacists have been kicking against it because to them they didn't understand the rationale behind introducing such when we accredit the programs. We needed something to act as more like standard for all the schools. We felt that this must start" (Director in regulatory organisation)

Just over half (57.7%) of survey respondents agreed or strongly agreed that the pre-registration examination was a good way to standardize graduate quality across schools. A median rank value of 2 indicated that most stakeholders agreed to this statement.

When these results were analysed, chi-square test of independence was performed to examine the relation between age and responses to the regulatory effectiveness variable. Stakeholder responses differed by age (see table 3.9). Younger pharmacists (18-24 years) were most likely to disagree or strongly disagree (42.8%) and least likely to agree or strongly agree (28.6%) to this statement which corroborates report made by education director in the qualitative phase of young pharmacists' opposition to the idea. The relationship between these variables was significant. X^2 (20, N=1250) = 83.69, p< .001.

Table 3.9: Regulatory effectiveness variable crosstabulation with age

		The recently introduced pre-registration examination is a good way to standardize graduate quality across schools.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
Age	18-24	4.8	23.8	28.6	23.8	19.0	100.0
	25-34	19.7	29.8	14.9	19.1	16.5	100.0
	35-44	29.1	35.0	16.7	11.8	7.5	100.0
	45-54	22.1	49.2	13.8	8.7	6.2	100.0
	55-64	28.0	44.0	14.7	6.7	6.7	100.0
	65 years or older	44.4	55.6	0.0	0.0	0.0	100.0
	Total	22.8	35.0	15.3	14.9	12.0	100.0

FIP acknowledges that harmonization of content and competencies is important at both country and regional level (FIP, 2018) to maintain uniform standards. While comparisons could be healthy and quite useful for quality

improvement, criterion referenced comparison (Hambleton and Li, 2014) against set standards rather than among schools may be a more equitable and measurable way to assure quality.

3.4.5 Regulatory Consistency

Accreditation and other quality assurance mechanisms are instrumental to the progress of pharmacy education and practice in LMICs (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al., 2008). Yet, they have been described as particularly weak in these contexts (WHO, 2013) mainly due to a failure to establish and implement fair and transparent standards (Babar, 2005; Ghilzai, 2008; Baumann and Blythe, 2008).

The regulation of pharmacy programmes in Nigeria takes place by resource verification at the commencement of the programme and subsequent accreditation every five years. A few stakeholders in the qualitative phase spoke of poor regulation, inconsistent, and inequitably applied accreditation standards as one of the major challenges. Older schools were being treated preferentially, and newer schools held to higher standards, and this led to the variation in graduate competence earlier described.

"The regulatory board should step up measures to ensure what is applicable in one state is applicable in all and if there is any school that does not meet the standard, such school should not be accredited and make sure they get all that would be required" (SWFG participant in community practice)

However, these views were not nationally perceived. About half of survey respondents agreed or strongly agreed (49.8%) to the statement that national accreditation standards are equitably applied across all pharmacy schools without prejudice. A median rank value of 3 indicated that most stakeholders were likely to give a neutral response to this statement.

Regulation issues were likely not caused by inequitably applied standards but challenges with the standards themselves. Some accreditation criteria were deemed unnecessary and unrealistic; expensive equipment- considering the socioeconomic condition of the country, and a high number of professors- considering the academic workforce shortage. FIP (2014) recommends that context must be considered when establishing quality standards. There were also suggestions to ensure standards are not just attained but maintained. There were reports of schools going above and beyond to meet accreditation standards and afterwards reverting to the status quo. For example, as regards professor numbers, the same professors make rounds of different schools for them to meet accreditation standards.

"You know the economy is bad and you just think that someone will buy a particular equipment worth 10 million naira that students rarely use and even if they use it, how would they utilize it in practice? What the universities would

do is spend all their money to buy that equipment and not build lecture theatres. How about use that money admit as many students, expand the lecture theatres, because you need the practitioners get as many lecturers as possible, focus on developing the curriculum and delivery, focus on that as a basis for accreditation instead of counting how many professors and you know the professors are not just there"(NWFG participant in academic practice)

The responsibilities of regulatory organizations towards the quality assurance of needs-based education have to be made clear with respect to policy development and implementation (Salamzadeh, 2004). These may include establishing fair, transparent, and realistic standards in line with national priorities and policies, as well as ensuring that these standards are equitably applied across schools (FIP, 2014) and maintained after the exercise. Accreditation, if properly used, is a key tool for quality management of professional education and ensuring graduates have competencies that correspond to accepted professional standards and population needs (WHO, 2013).

3.4.6 Experiential Learning

The science-focused pharmacy curriculum which characterized previous educational domains in HICs (Shah et al., 2010; Breimer, 2001) is still maintained in many LMICs (Babar, 2005; Ghilzai, 2008; Ghilzai, 2009; Mangasuli et al., 2008; Ikhile and Chijioke-Nwauche, 2016; Mendonça, Freitas and Ramalho de Oliveira, 2017). Although pharmacy education has evolved overtime to a patient-focused, practice-based study, the successful incorporation of the experiential component has been difficult to achieve (Collins et al., 1999). Curricular 'import' by LMICs is often done in a selective pattern due to infrastructural deficits, thereby offering limited opportunities for application of knowledge to patient care (Shah et al., 2005).

Most participants described the curriculum as theory-focused and stated that pharmacy as a practice-based profession should expose students to real-life practice situations and experiential learning often and over the entire course of study. This was thought to be necessary to build confidence (Noble et al., 2014), competence, foster deep learning of theoretical concepts and socialize students into the profession (Ting, Wong and Thang, 2009). Which would lead to the provision of high-quality patient-centred care (DiFrancesco, 2011). In the Nigerian context, there are formal requirements for experiential education incorporated into the curriculum: Student Industrial Work Experience Scheme (SIWES) for 6 months in the third or fourth study year and the Clerkship exercise for 12 weeks in the final year (Ikhile and Chijioke-Nwauche, 2016). These notwithstanding, participants reported that students were not sufficiently exposed to practice situations.

"I don't really like the way the curriculum is structured, it is more of theory-based, it stereotypes students to theory, reading and passing exams, the

laboratories are not really equipped, even when they are equipped the technical knowhow is not there. We have situations where the students would go to the labs and wait long hours before a technician is being called upon to take the class. And again, at my level now, the final year, I have found out that much of the knowledge I have is theory, I cannot really boast of practice" (Final Year Student SSFG)

A theory-based practical session referred to as "alternative to practicals" was sometimes conducted instead of practical sessions due to lack of infrastructure. A participant recounted to the group how he openly challenged a lecturer when this same theoretical approach to practical courses was carried on to postgraduate study, and a clinical skills educator attempted to teach these skills without demonstration.

…when we were doing our WAPCP, I challenged the lecturer, the lecturer was always saying so you do palpation, auscultation, I said, 'Oga' (teacher) do it, do it let me see!!! What are we talking about??? We can't continue like this!! (SSFG Clinical Pharmacist participant)

Wilson et al. (2005) argued that in education, the emphasis should be on 'know how' rather than 'know all' which seemed to be the focus in pharmacy education with the overloaded curriculum yet limited practical exposure, thereby negatively affecting students' confidence. A participant with multi-sector experience described graduate pharmacists' attempt to make informed contributions when asked during ward rounds in hospitals as "*chopping mouth*"; a Nigerian term for mumbling when you are unsure or lacking knowledge and confidence.

This perspective was not made clearer by the quantitative phase as results showed an almost equal distribution between those who agreed and disagreed to the statement that the undergraduate programme gives sufficient opportunity for applying scientific classroom knowledge and taught concepts in hospitals and other simulated real-life settings. A median rank value of 3 indicated that most stakeholders were likely to give a neutral response to this statement.

Analysing by universities, there were also no evident geopolitical patterns, respondents who schooled outside Nigeria were most likely to agree or strongly agree (70%) to this statement while those that graduated from Unilag were least likely to agree or strongly agree (27.1%) (see table 3.10).
When these results were analysed, chi-square test of independence was performed to examine the relation between university attended for undergraduate degree and responses to the experiential learning variable. Stakeholder responses differed by university. Graduates form UDUS were most likely to strongly agree (18.2%) while graduates from DELSU were most likely to strongly disagree (14.8%) to this statement. The relationship between these variables was significant. X^2 (72, N=1253) = 132.95, p< .001.

Table 3.10: Experiential learning crosstabulation with university attended for undergraduate degree

		The undergraduate programme gives sufficient opportunity for applying scientific classroom knowledge and taught concepts in hospitals and other simulated real-life settings.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
University attended for undergraduate degree (if more than one, please select the one you graduated from)	UniMaid	16.7	38.3	21.7	18.3	5.0	100.0
	UniJos	4.7	30.9	22.8	32.9	8.7	100.0
	UnIlorin	0.0	0.0	100.0	0.0	0.0	100.0
	ABU	8.2	39.3	19.2	26.0	7.3	100.0
	UDUS	18.2	45.5	27.3	9.1	0.0	100.0
	UNN	5.2	33.3	10.5	39.9	11.1	100.0
	NAU	7.7	50.0	30.8	11.5	0.0	100.0
	UniUyo	16.7	36.1	5.6	38.9	2.8	100.0
	UniBen	4.2	37.0	18.5	31.1	9.2	100.0
	Igbenedion	25.0	37.5	12.5	25.0	0.0	100.0
	UniPort	23.1	30.8	7.7	15.4	23.1	100.0
	Madonna	16.7	40.0	20.0	20.0	3.3	100.0
	DELSU	7.4	48.1	18.5	11.1	14.8	100.0
	NDU	5.0	55.0	5.0	30.0	5.0	100.0
	UI	6.8	25.7	23.0	36.5	8.1	100.0
	UniLag	4.7	22.4	21.2	43.5	8.2	100.0
	OAU	10.4	22.4	17.2	38.8	11.2	100.0
	OOU	5.1	28.8	20.3	40.7	5.1	100.0
	Outside Nigeria	10.0	60.0	20.0	10.0	0.0	100.0
	Total	8.1	33.8	18.4	31.6	8.1	100.0

Difficulties often exist in differentiating activity from learning experience (Smith, 1994). Students may go on ward rounds but are unable to participate in learning if medical doctors talk over their heads, and use terms they are not accustomed to, or if they are totally ignored and treated as second class learners. Some PharmD graduates and current students decried the inefficiency of the clinical rotations where students were not learning much but just ticking a box which may be an example of activity rather than experience.

"The difference is not much apart from the clinical setting which to me is not really there, like the ones that come to the hospital how often do they come to

the hospitals, and what do they even learn, if at all they come to the hospital for training and perception…The knowledge is watery personally it was like a fun time going on clinical rotations". (PharmD Graduate)

Research has found that important issues which pharmacists have to handle in practice most often do not fit precisely into the disciplinary divisions used to design pharmacy curricula (Cooke et al., 2010). They may only be learnt in real-life practice situations, hence the need for better experiential learning monitoring and supervision to ensure it is a learning exercise rather than a mere tick-box activity.

3.4.7 Assessments Techniques

Assessment is a multifaceted process of evaluating the student in action. This focuses on ensuring that the student can demonstrate specific learning outcomes that represent growth and development to required standards across appropriate courses. While this definition, as well as acceptable assessment techniques have evolved overtime, the notion of demonstrable outcomes for acquired competencies has remained. This was the core purpose of assessments, which according to stakeholders was not achieved by the methods employed in Nigerian pharmacy schools, especially considering that competencies were not expressly defined in the BMAS.

Several methods of assessment exist, and these have generally gone beyond the dichotomized summative and formative approaches (Eva et al., 2016; Lau, 2016). The summative approach is assessment of learning while the formative is assessment for learning. Cognitive tests are still accepted as the best tool for assessing students' academic progress considering that non-cognitive skills are complex to measure. However, in the Nigerian context, the traditional summative approach is often employed solely, rather than a combination of both, or mostly formative, considering that formative is more useful for student growth in learning (Black et al., 2003; Stiggins, 2008; Schuwirth, 2011; Martinez, 1989; Brown, 2004). Most participants in practice stated that the way assessments were conducted in pharmacy schools needed to be reviewed. They explained that the questioning techniques encouraged memorizing notes rather than an application of taught concepts in case study or practice scenarios.

"I have had the privilege of doing some courses outside of Nigeria. It was so real, it was stress free, even the exams we were asked to go in with our books, you understand, we enjoyed it and we were able to give in our best. But if it were to be in Nigeria, we would cram throughout the night and after the exams we would have forgotten everything (Regulatory Pharmacist SSFG).

Some participants who had a PharmD also reported that they were not assessed on clinical rotations by preceptors but by the school in which case only theory taught in school would be assessed. Another participant who had

undergone the PharmD conversion programme had a different view and stated the assessments were a lot better than the BPharm assessments, so participants were hopeful that the change to the PharmD may address the assessment issue.

"The conversion program takes you through all the sciences you did in all those departments and brings it into practice. The exams were better than BPharm exams in the sense that you can relate it. In BPharm we just crammed the structures to pass exams" (PharmD Conversion Graduate).

The opinion of inadequate or inappropriate assessment methods was shared by pharmacists nationally most respondents agreed or strongly agreed (70.8%) that written assessments in pharmacy school require students to reproduce lecture notes rather than apply taught concepts. A median rank value of 2 indicated that most stakeholders agreed to this statement.

With the ability to assess communication, problem solving, as well as clinical judgement skills, OSCEs are the gold standard in clinical assessments for pharmacy worldwide, (Shirwaikar, 2015). Due to what is perceived as their resource intensive nature, they are often not used in LMICs (Kalungia et al., 2019). However, different levels of cognitive abilities should be measured using different types of tests (Miller, 1990). While the 'knows' and 'knows how' levels could be measured by written objective tests, the 'shows how' and 'does' levels require performance-type assessment methods such as mini clinical examinations and 360-degree workplace evaluations (Downing and Yudkowsky, 2009). Assessments should also go beyond testing cognitive knowledge to assessing possession of required skills to practice independently in due course. Appropriate techniques combining both formative and summative methods and taking into account levels of cognitive ability to be measured for student assessment should be considered for both didactic and experiential settings rather than a blanket default that is ineffective (Lau, 2016). Assessments should be timely and useful, include the ability for independent self-directed learning and competencies should be assessed throughout the curriculum (FIP, 2017) to ensure optimal education outcomes and provide data for continuous curricular improvements. Generally, good assessments should lead to improved outcomes, contribute to global evidence base, and encourage local ownership and involvement.

3.4.8 Competencies

While general areas of expected competency have been suggested within the global competency framework (FIP, 2012), the specific scope of knowledge skills and attitudes within these categories should be identified by a consensus of stakeholders and practitioners, be relevant to current and future healthcare needs, reflect national priorities, and be used to guide the development of student learning outcomes. In the Nigerian context, competencies which pharmacy graduates should possess are not clearly

specified, strategies to measure them in the curriculum are also not indicated. Atkinson et al., (2014) suggested that specifying what graduates are expected to do from the onset eliminates ambiguity and leads to a well-harmonized programme. Stakeholders in education leadership stated that they were aware of competencies that students were required to possess prior to graduation but could not articulate these because they were neither clearly stated in official documents nor linked to learning objectives.

"We should lay it out in the objectives…. what the students should be. If you don't get it down for everyone like that they may not know. That is why at times the student has the didactic knowledge, but they cannot recall it in the form of skills and competence". (Regulatory Director I).

The survey aimed to determine the extent to which the undergraduate pharmacy education programme equipped pharmacists with competencies identified from global and local standard documents as well as this research (see table 3.11).

Table 3.11: The extent to which undergraduate education equipped pharmacists with the following competencies

Key for table below- TVGE-To a very great extent, TGE-To a great extent, TME-To a moderate extent, TSE-To a small extent, NA-Not at all, N- Count

	TVGE	TGE	TME	TSE	NA
	N %	N %	N%	N %	N %
Primary care, Consultation and Diagnosis	15.8	26.9	36.9	17.5	2.9
Drug Synthesis, Development and Manufacturing	10.7	24.5	37.6	22.6	4.6
Quality Control and Assurance	14.4	33.3	35.2	14.5	2.6
Evidence Based Care	12.7	28.4	36.3	18.4	4.2
Public Health Pharmacy	12.6	24.6	29.3	23.3	10.3
Rural Health and Community Practice	13.4	22.8	30.3	23.3	10.2
Veterinary Pharmacy	1.7	5.6	17.3	32.6	42.7
Policy and Implementation Science	5.3	15.3	33.6	27.7	18.1
Herbal and Alternative Medicine	13.4	31.6	34.6	16.4	4.1
Communication Skills	25.2	38.8	23.0	9.8	3.1
Problem Solving Skills	21.6	40.1	24.7	10.1	3.4
Reflexivity and Critical Thinking Skills	22.4	35.7	26.1	11.7	4.0
Research Skills	14.6	31.6	34.2	15.1	4.5
Entrepreneurship, Finance and Business	12.4	23.7	32.1	20.0	11.8
Supply Chain Management	9.7	20.5	30.7	22.1	17.0
ICT Knowledge and Skills	7.6	15.4	30.1	26.2	20.6
Interprofessional Interaction	13.3	26.0	30.6	20.7	9.4
Leadership Skills	16.0	29.6	32.2	15.4	6.8
Social Determinants of Health	10.5	24.9	35.6	19.3	9.7
Collaboration and Teamwork	20.7	35.1	29.9	10.5	3.9
Lifelong Learning	22.9	34.8	25.9	10.8	5.6
Cultural Intelligence	13.6	23.2	35.6	16.4	11.1

Most pharmacists thought their pharmacy programme equipped them at least to a moderate extent with most competencies except lifelong learning, collaboration and teamwork, problem solving, reflexivity and critical thinking, and communication skills which were to a great extent. This was in line with the recommendation to prioritize transferable skills for future employability (WEF, 2018). They did not think it prepared them at all for veterinary pharmacy practice, which has now been added to the new PharmD curriculum and further discussed in chapter 6.

Other competencies that may need more attention in undergraduate pharmacy teaching include public health, rural health and community practice. These are competencies required for local relevance, so the focus on global comparability may explain the insufficient attention paid to these

competencies. Policy and implementation science, entrepreneurship, finance and business, ICT knowledge and skills, supply chain management, interprofessional interaction and cultural intelligence are also competencies that need more attention in the curriculum.

As with other health professionals' training programmes, there has been a shift in focus from educational processes to educational outcomes (Norcini et al., 2013). The most important factor is and should be not what the curriculum is like but what the curriculum can do which is reflected in the competencies that graduates acquire after being trained in that programme.

3.4.9 Local Relevance

Having established the global focus of the pharmacy programme, as well as curricular descriptors reflecting global comparability, prioritizing country specific needs was the flip-side requirement described by stakeholders to attain fit-for-purpose education. This, however, was not emphasized by stakeholders in education but by employers of pharmacists in practice, who did not think the Nigerian pharmacy curriculum paid sufficient attention to local needs. Especially considering that infectious diseases such as malaria, tuberculosis and HIV were among the leading causes of death in the country (WHO, 2018). Global standard recommendations (FIP, 2013; FIP 2016), as well as published literature (Hadi, 2010; Pieterse, 2010) recommend both global and local compliance, however, they specify that local relevance should precede global comparability for a fit-for-purpose pharmacy programme.

"In terms of the needs in Nigeria, I think we are beginning to neglect tropical diseases and they are beginning to crop up more, regional endemic diseases for example, Ebola, Lassa Fever. Did you go through any of that in pharmacotherapy? There was no emphasis on it. So, we need to look at those, and when we talk about public health components there are a lot of things we have in Nigeria that are still priority to us even though it no longer a priority in the world. Malaria is still a priority to us even though it is no longer in several other countries. HIV/AIDS we are beginning to see lots of people whose treatment progress is no longer successful we need to look at all of that". (Clinical Pharmacy Lecturer LFG)

In the survey, the highest percentage (33.5%) of respondents within the scale disagreed that country specific healthcare needs were prioritized in the Nigerian pharmacy undergraduate programme. However, a median rank of 3 indicated a central tendency towards the neutral response. Hence, qualitative perspectives were not made clearer by quantitative responses.

When analysed by sector of practice (table 3.12), respondents in global health, public health and NGO's where country specific needs are mostly encountered were most likely to disagree and strongly disagree (58.1%) with this statement, and least likely to agree (23.1%). While those in other non-conventional areas of pharmacy practice were most likely to agree (35%) and least likely to disagree (5%).

Table 3.12: Local relevance variable crosstabulation with practice sectors

		Country specific health care needs are prioritized in the Nigerian pharmacy undergraduate programme.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
Practice Sectors	Hospital Practice	5.3	24.2	26.2	33.1	11.1	100.0
	Community practice	8.0	24.4	23.6	29.3	14.8	100.0
	Industrial Practice	5.1	19.0	22.8	34.2	19.0	100.0
	Academia/ Research	3.3	25.0	20.8	36.7	14.2	100.0
	Administrative /Regulatory/ Ministry	3.7	24.7	24.7	34.6	12.3	100.0
	Sales and Marketing	2.7	17.7	23.0	38.1	18.6	100.0
	Global Health/Public Health/NGO	2.8	20.3	18.9	35.0	23.1	100.0
	Other (Pharmacy)	15.0	20.0	60.0	0.0	5.0	100.0
	Non-pharmacy	5.6	11.1	33.3	27.8	22.2	100.0
	Outside Nigeria	6.3	21.9	31.3	25.0	15.6	100.0
	Total	6.3	23.2	23.4	33.6	13.6	100.0

While keeping up with international standards and seeking global comparability are both valid desires and requirements for quality education, if not balanced with local applicability and suitability of standards, it may just be another form of development as displacement (UNDP, 2002). This ultimately would neither be feasible nor sustainable and would likely lead to skill mix imbalance where skills acquired are useful for other countries but not for the country training such pharmacists. Stakeholders in education leadership acknowledged this skill mix imbalance as a reality in Nigerian pharmacy

practice but was reported to 'disappear' once graduates travel to reference countries to practice.

"We have borrowed from the western world so we are like at the same level, and that is why when they (pharmacy graduates) are here they get discouraged, they are not satisfied because everything they have learnt, they are not able to put it in practice. But when they now go there (Western world), they are able to fly because the facilities are there, and they are allowed to practice what they have learnt" (Dean SW University).

Matowe (2004) and Babar (2013) discussed this compulsion to produce graduates of 'international' standards in LMICs to the detriment of local relevance which is not in line with the pharmacy education taskforce global strategy for education development which calls for every system to assess the needs of its community and then develop or adapt the supporting educational system accordingly (Anderson et al., 2009). When this is not done pharmacists do not have the capabilities to provide healthcare services for their communities which has implications for the health status of these countries. This also raises the big question "Who is the Nigerian pharmacy education system training pharmacists for?" if the programme prioritizes global relevance over local applicability.

3.5 Human Capacity

Human capacity in this study is defined as the ability of individuals to perform specific functions efficiently, effectively and sustainably (Milen, 2001) in a way that contributes to the objective of achieving fit-for- purpose education. Within this study human capacity was discussed mainly as it relates to academic staff and students within universities. While non-academic and other support staff were part, and contributed to the successful running, of the pharmacy schools, they were not referred to during stakeholder discussions. Educator deficiencies and student concerns were two major subthemes discussed within this theme.

3.5.1 Educator Deficiencies

Faculty shortages (FIP, 2009), and poor training of available educators (Rigoli and Dussault, 2003; Anderson and Futter, 2009; Dayrit and Dolea, 2006) in the LMIC context, have been widely documented in literature. This is not peculiar to pharmacy but cuts across most other health-related professions. Terms like 'deintellectualized' have been used to describe the poor staff competence in some institutions of higher learning (Bamiro, 2012). While this may not be the case for pharmacy programmes where faculty members may have vast clinical knowledge and skills, they are often insufficiently prepared as teachers and trainers in many countries, hence their capacity to prepare future professionals for evidence-based practice, interdisciplinary team work, management or leadership is undermined (WHO, 2013).

The focus for developing the academic workforce in LMICs to date has mainly involved taking academics from LMICs to HICs for post graduate clinical studies, with less concentration on developing teachers and trainers who can significantly increase the throughput of high quality trained pharmacists for the workforce (Anderson et al., 2009).

Academia was described as the least financially rewarding sector of pharmacy practice. Roush et al. (2013) found that poor remuneration was a major factor leading to dissatisfaction among pharmacy faculty. Statistics showed that as a result, a very small percentage of Nigerian pharmacists (0.8%) practice in academia (Ekpenyong et al., 2018). This workforce shortage was made worse by ongoing emigration of pharmacists to the global north in search of more favourable working conditions (Matowe et al., 2004; Levy, 2003), and had led to increased workload on available staff and hence reduced productivity. This was occurring amidst increasing student numbers and an expanding curriculum due to new frontiers of pharmacy practice. Participants also decried the inverted pyramid staffing style where efforts were made to hire more senior staff leading to an overwhelming workload for the few junior academic staff.

"….in fact, till date the academic is the least paid pharmacist professional in Nigeria, I stand to be quoted anywhere. That's why in one of the presentation, I think that was in NAPSA conference in US 2014, 2% of pharmacists that graduate from Pharmacy schools actually return to academia, only 2%, the bulk go to clinical….community and hospitals while another good percentage go to the industry, the least proportion is in academia" (Dean SS University)

Stakeholders acknowledged the heavy workload on academic staff with a high percentage (83.4%) of respondents agreeing or strongly agreeing to the statement that heavy workload made worse by staff shortage had negatively impacted pharmacy faculty productivity. A median rank of 2 indicated a tendency for stakeholders to agree to this statement.

In addition to academic workforce shortage, there were also geographical distribution disparities. Most pharmacists practiced in cities and urban areas, while the rural areas had very few, or in some cases, no pharmacists. 41% of total pharmacist population practiced in Lagos and Abuja (2 major urban cities) out of 36 states (Ekpenyong et al., 2018). This disparity is neither peculiar to Nigeria nor to pharmacy and has been widely documented in literature (Taylor and Harding, 2001; Smith, 2001; Roush et al., 2013). Yet one of the crucial needs identified by research particularly in LMICs is to train pharmacists who have internalized their role of helping to meet medicine-related needs of poorer, less urbanized communities (Anderson et al., 2009). In Nigeria, religious and political unrest in the Northern zones resulting in insecurity was another major reason for higher pharmacist numbers in the south. Suggestions for geographical redistribution in literature include

locating universities in rural areas (Snadden and Bates, 2005) and providing incentives for students to remain after study. This appeared to be the single factor most strongly associated with rural practice (Grobler et al., 2009), and may be the most useful solution in the Nigerian context since Northern residents are usually more comfortable practicing there.

This suggestion was well-accepted by stakeholders in the quantitative phase. A majority (81.6%) agreed or strongly agreed that maldistribution can be addressed by providing incentives to students who school in rural areas to practise there after graduation. A median rank of 2 indicated a tendency towards the 'agree' response.

In the Nigerian pharmacy context, there is also no formal training for pharmacy educators after employment (Asiyai and Oghuvbu, 2009), and current policies prohibit pharmacy lecturers from practising in their sector of specialization to gain practical experience, hence they are often unable to stay in touch with practice. Stakeholders were clearly opposed to this policy as almost all (95.2%) agreed and strongly agreed that experience along with ongoing practise exposure in main areas of teaching and research are necessary for educator relevance. A median rank of 1 indicated that there was a tendency for stakeholders to strongly agree to this statement.

An industrial CEO participant reported that educators taught obsolete topics in school. Having employed several graduate pharmacists over the years, he had noticed this. A situation, he said, that was not helped by the lecturers' unwillingness to collaborate with the industrial sector to update their knowledge. Participants in practice thought the university system was closed up and one participant described it as a 'cult' where no one knows what goes on there and where they cover up each other's ignorance.

"……when they were trying to upgrade or start up again there were some machinery enquiries they were making that I had to intervene. They were asking for tray dryers how to purchase them and so on. I talked to the dean and told him you cannot be training students on tray dryers now because they are not going to find it in the industry, you should be talking about fluidized bed dryers" (SEFG in industrial practice)

This is was clearly one of the important determinants for fit-for-purpose education in this study, and poor graduate competence in Nigeria had been linked to lack of teaching effectiveness (Akinmusuru, 2009). Which corroborates research that found teacher qualification to be a stronger predictor of student learning gains than race and parent education combined (Clotfelter, Ladd and Vigdor, 2007). This should therefore be a priority in education development. A Masters' degree or a PhD which are research based were often assumed to be sufficient training for a pharmacist to teach students undergraduate pharmacy courses. Many participants in the

qualitative phase agreed that a PhD alone cannot provide educators with requisite skills for teaching undergraduate courses.

"The fundamental issue here is that it is assumed that a PhD qualifies you to be a lecturer but the truth is a PhD qualifies you to be a researcher but does not qualify you to be a lecturer but what we find is that a person comes into the system fresh with a PhD and then is now sent into the classroom. They have not been exposed to basic teaching skills…. there is still that big deficiency. People need to be trained in basic teaching skills as lecturers rather than them coming, and whatever they feel they should do they just do and that may not necessarily be what is required" (Dean SW University)

The view that educators, even those with a PhD, still needed to be trained in teaching was shared by slightly over half (52.7%) of the survey respondents. They either disagreed or strongly disagreed that a PhD alone was sufficient training for teaching. A median rank of 4 indicated a tendency for stakeholders to disagree to this statement.

Suggested strategies for teaching improvement included student evaluation of teaching as a criterion for promotion and quality assurance, in line with global standards that recommend that quality metrics should include feedback from students (FIP, 2017). Quality teacher training is shifting focus from teacher-centred to student-centred approaches. Innovative teaching practices and engaging in self-reflection helps teachers review their actions and assess the impact of their efforts.

"in order to sensitize people on the need for evaluation of teaching not just for promotion but basically improving the skills of the lecturer." (Dean SW University)

This suggestion was accepted by the majority of respondents (62.4%) who agreed or strongly agreed that student evaluation of teaching is a useful index for promotion of lecturers. A median rank of 2 indicated a tendency for stakeholders to agree to this statement.

A power dynamic was both observed and reported during interviews, illustrated by the way in which educators constantly referred to students as products or children. This was highlighted in one of the groups as one of the reasons for low self-confidence in pharmacy graduates.

"I also found out that there is this big brother-big stick relationship they have with their lecturers. It's like shut up I'm your teacher with all due respect please…We interacted with students, we asked them, so we are not just guessing. During our preceptorship we find time to talk to them about building up their self-esteem, so they said that they are not allowed to express themselves as students. It is something we really need to look at. For me, there needs to be a re-orientation of the teaching staff" (Preceptor, SEFG)

Other issues discussed included resistance to new ideas and gerontocratic rigidity amongst academics, shirking responsibilities at all costs, a tendency for educators to compete amongst themselves rather than collaborate, among others. It was observed, however that the concept of absenteeism and 'ghost working' which is commonly described as a major educator deficiency in the Nigerian higher education context (Onwachukwu, 2015; Idris, Adaja and Audu, 2015; Udoh, 2017) was not reported within this study. This could probably be because pharmacy educators as professionals have a higher sense of commitment to employment and service.

3.5.2 Outdated Teaching Materials and Techniques

Capacity building must go hand in hand with tools and techniques to enable desired workforce transformation. Course appropriate, innovative pedagogies as well as relevant materials to improve student engagement and ensure equitable participation. Static pedagogies in the LMIC context have been identified in literature as one of the reasons for slow change (Roush et al., 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010). In this study participants in academia referred to this as 'conservative teaching' which they practiced, and this may be why education struggles to catch up with the demands of current practice. The 'yellow note' phenomenon where lecturers had not changed their teaching notes for many years to reflect changes in practice realities was also reported by some participants.

"…and if you look at the handout, people that did the programme eight years ago still used that same handout. I saw '1992' on the notes of a course we did in 2008, the notes were brown already. Brown notes were what they photocopied. That's to show you when they wrote that note" (SSFG participant in community practice).

The highest percentage (31.8%) of respondents disagreed that lecturers teaching notes and other materials were regularly updated to ensure up to date information and support future developments. However, a median rank of 3 indicated a tendency towards the neutral response.

When analysed by sector of practice (table 3.13), participants in academia and research were most likely to strongly agree (9.17%), and least likely to strongly disagree (4.17%) that teaching notes were regularly updated. This is likely because they prepare these notes and would not self-report if this was the case. While those in sales and marketing were most likely to strongly disagree (18.42%).

Table 3.13: Teaching materials variable crosstabulation with practice sectors

		Lecturers' teaching notes and other teaching materials are regularly updated to ensure information provided is up to date and supports future developments.					
		SA	A	N	D	SD	Total
		N %	N %	N %	N %	N %	N %
Practice Sectors	Hospital Practice	6.9	4.1	23.9	34.2	10.9	100.0
	Community practice	9.0	24.1	26.4	27.6	12.9	100.0
	Industrial Practice	1.3	24.1	32.9	31.6	10.1	100.0
	Academia/ Research	9.2	35.8	20.0	30.8	4.2	100.0
	Administrative /Regulatory/ Ministry	4.9	30.9	22.2	29.6	12.3	100.0
	Sales and Marketing	4.4	11.4	28.1	37.7	18.4	100.0
	Global Health/Public Health/NGO	5.6	23.8	22.4	35.7	12.6	100.0
	Other (Pharmacy)	0.0	30.0	45.0	15.0	10.0	100.0
	Non-pharmacy	8.3	16.7	36.1	22.2	16.7	100.0
	Outside Nigeria	3.2	12.9	19.4	48.4	16.1	100.0
	Total	6.1	24.8	25.3	31.8	11.9	100.0

In many discussions, pharmacy educators were reported as not being up to date with teaching techniques which included using mainly didactic delivery methods as well as not sufficiently utilizing ICT facilities to maximize delivery and improve students' engagement. This opinion was also not corroborated by quantitative responses where a higher percentage of respondents agreed or were neutral (62.1%) to the statement that course appropriate techniques were used in classrooms by pharmacy educators with a median rank of 3 indicating a tendency towards the neutral response.

Educators insisted that several challenges to the use of ICT facilities existed, chief among them was erratic power supply. Others included unavailability of infrastructure and lack of training in ICT.

"like I mentioned in most schools of pharmacy you have challenges of equipment, not too good light power supply." (Dean NC University)

To train fit-for-purpose pharmacists who would be useful to the societies requiring their services, teaching materials must be regularly updated to reflect current advances and the future direction of pharmacy practice. Course-appropriate teaching techniques employing ICT should be utilized and identified barriers attended to.

3.5.3 Student Concerns

One of the major concerns expressed by students was a lack of support while in school. Instituted systems such as appointment of course advisers for each student were not efficient and often unavailable when needed. Mentors were also largely non-existent.

"I lost my father in school and I couldn't find my course adviser, I had exams to write during my father's funeral and I couldn't find my course adviser, if not for another lecturer I would have had many carry overs. Course advisers should call the students they are advising from time to time to ask if they are facing any challenges. I was disappointed with the system at that time" (Newly Qualified Pharmacist).

Participants spoke of instituting mentoring schemes for students by experienced pharmacists in students' chosen area of specialization to aid transitioning and provide insights into the pharmacy career. These benefits of mentoring by older pharmacists have been highlighted by Jee, Schafheutle and Noyce (2013). Most respondents (96.9%) agreed or strongly agreed that pharmacy students will benefit from being mentored by experienced practising pharmacists, with a median rank of 1 indicating a tendency to strongly agree.

While students spoke of inefficient support mechanisms, it is also important to note that inefficient admission policies and procedures have not ensured that the best students get into the programme in the first place. Reports of admission discrimination based on social class and ethnic group exist (Frenk et al., 2010) and this is found in the Nigerian context as well. Stakeholders in academic leadership discussed admission pressure and how this has negatively affected the quality of students who get admitted into the pharmacy programmes. Pressure from parents and politicians due to societal perception of the profession and perceived benefits of possible independent practice after graduation were mentioned. Sosabowski and Gard (2008) revealed that admission numbers go up when post-education employability is assured. An education director spoke of students who were forced to study pharmacy by their parents and hence were not able to give their best in school.

"In those days we discover that someone who is going into University is going there with all your effort to come out the best. These days, it's not so. Many at times we have situations where parents- they just want their children to read a

course whether that is what they are interested in or not. They don't want to know; they just want them to read a particular course. They force them into such". (Education Director I)

While data on attrition rate in LMICs is limited, available evidence reveals an attrition rate of about 20-30% (Huda and Agha, 2004), due to a lack of zeal and dedication required to go through the rigors of pharmacy school, and student failure. High attrition rate has been attributed to faulty admission process into pharmacy schools in Nigeria based on quota systems and catchment area policy rather than oral assessment to ensure suitability before being granted admission (Omeje et al., 2016), as is the practice in many other countries. Though it has also been argued that significant aspects of learning, such as clinical judgment, clinical reasoning, empathy and interpersonal functioning, are not easily measured by these interviews (Louie et al., 2004; Tanner, 2001; Yeates et al., 2013; Epstein and Hundert, 2002), they may well reveal some undesirable character traits and reluctance to study, and help identify students with characteristics that would increase chances of success in the course. Sorensen (2009) showed that while some skills can be learnt, others must be built on and one cannot build on skills that are not present in the first place.

This view was corroborated as about half (50.6%) of stakeholders nationally agreed or strongly agreed that interviewing orally before admission into pharmacy school to ascertain possession of desirable character traits will minimize school dropouts. A median rank of 2 indicated a tendency towards the agree response.

Student support and mentorship need to be prioritized in education policy and development. The global standard stipulates that quality improvement in any programme must always attend to student concerns and issues (FIP, 2017), in order to achieve a fit-for-purpose programme.

3.6 Infrastructure Availability

It is globally understood that no programme can be successfully undertaken without the right infrastructure in place. Infrastructural requirements of pharmacy schools are specified in the BMAS and include acquisition of learning materials and equipment, construction, maintenance and repair of laboratories and other buildings. These are similar to recommendations in the global quality assurance document (FIP, 2014). However, a major challenge to infrastructure availability identified in this study was poor funding.

3.6.1 Poor Government Funding

Funding is at the heart of enabling actions which will make fit-for-purpose education possible (Frenk et al., 2010). However, it is a globally acknowledged challenge to quality education. In Nigeria there are peculiar financial circumstances which have earned the country its informal reference as a

'poor-rich' country. In spite of substantial oil revenues and ample natural resources, per capita income is lower today than it was in 1970. The non-oil economy is stagnant, and Nigeria has been described as one of the most difficult countries in the world for private business (CID and WEF, 2000). The material conditions for progress seem to be available but human and cultural factors stand in the way of said progress.

One of the major issues associated with poor funding was corruption. Research has shown that corruption is a global phenomenon, old as time and still existent, intelligible only in social context, it is endemic to all governments and not peculiar to any continent or region (Lipset and Lenz, 2000), but this does not mean that it is equally experienced in every society. In sub-Saharan countries it was identified as the underlying cause of many education challenges such as poor infrastructure, outdated equipment, poor staff motivation, embargo on employment despite staff shortages (Akinyemi, 2013). Misappropriation and embezzlement of funds (Ololube, 2016) by government officials had gone unchecked overtime and resulted in the current state of education nationally. Corruption was described as both the reason for and the consequence of poor funding. For example, insufficient funds often led to delayed or non-payment of staff salaries which further proliferated corruption among staff in a bid to survive. This vicious cycle can only be broken when corruption is eradicated. This may be difficult considering that it has been the principal means of private accumulation in Nigeria since the decolonization period (Osoba, 1996) and remains so (Gholami and Salihu, 2019). It is now generally believed to be the bane of the Nigerian economy. It was clear from stakeholder responses that it had been interwoven into the fabric of society and was seemingly beyond the governments' and citizens' control, especially considering that all government regimes without exception have been pervaded by corruption. Some reported a state of overwhelming helplessness when you find that often times you had no choice but succumb to it.

"You come with motivation and you realize most of the people you work around are corrupt and then you lose your professionalism" (NWGF Participant in Hospital Practice).

The issue of corruption has received extensive attention in academic communities (Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015) in Nigeria, hence has varying definitions, but for the purpose of this study and as understood in the Nigerian context it is any effort to secure wealth or power through illegal means and at the expense of public good, or the misuse of public power for private benefit. Stakeholders reported that the singular most important solution to funding challenges in research and education was the eradication of corruption, or at least minimizing it if eradication seemed impossible. The federal government set up a Tertiary

Education Trust Fund (TETFund) for the development of universities but due to serial embezzlement along the chain, what gets to the schools is barely enough to get anything done.

"I will think it is an issue of corruption because it is not as if Nigeria is poor, because if you listen to the amount of money they budget in TETFund projects you will discover that most Nigerian universities should be as good as South African Universities in terms of equipment and quality but along the line these things disappear and they don't not really get to the classrooms otherwise we will not have the need to be begging companies to assist when we have government arranged TETFund to help" (Dean SE University).

The resultant poor funding had negatively impacted the higher education sector in more ways than one. With public universities largely dependent on the meagre government funding, there was less money available per student for quality training and education (Gazzola and Didriksson, 2008). The allocation to Education in the National Budget in recent times has also been poor. Allocations for 2003, 2004 and 2005 financial years were 7%, 12% and 11% respectively and in 2019 back to 7%. This is far from UNESCOs recommendation of 15-20% budgetary allocation. For education, Nigeria spends an estimated 2.4% of its GNP while Sub-Saharan Africa as a whole spends 5.1% (UNESCO, 2000; Hinchcliffe, 2002).

Of the 18 accredited schools, only two were private, the others were funded by the Federal and State government. Stakeholders in education leadership complained about very low government funding of the higher education sector. The 7% budgetary allocation would still be split between primary, secondary and tertiary education, with the lowest allocation to universities. Funding was so poor that they often had to seek alternative sources to keep universities in proper working order. Several deans described their struggle to stay afloat by soliciting support from alumni and philanthropists because of budget cuts to education. This demonstrated a lack of political will to improve the education sector.

"Because the money was not there, I got an inspiration to start a program which has become a strategy that we are implementing and that is alumni-class set strategy for mobilization. So far it has worked great we have been able to put all the facilities in top condition. We have about 8 class sets who have taken up one project or the other, all the laboratories are going to be refurbished soon" (Dean SW University)

Lack of funds for research was also discussed as evidenced by Nigeria having one of the lowest official development and assistance to medical research and basic health sector per capita (WHO, 2017). Available data indicate low levels of investment in research capacity and education and may explain why the country's non-oil economy has remained consistently sluggish during a decade

of international economic expansion. In reference to research output the number of scientific publications in Nigeria for 1995 was 711, which is significantly less than its output of 1,062 scientific publications in 1981 by a comparatively much smaller university system. In contrast, scientific publications were 3,413 for South Africa, 14,883 for India, and 5,440 for Brazil (Taskforce on Higher Education and Society, 2000). The country's low research output probably reflects the low priority accorded to research and development by government decision-makers. For example, Nigeria's federal university system spends only 1.3% of its budget on research (Hartnett, 2000). Stakeholders reported a lack of research grants as a major reason for poor output. Research was steered towards more lucrative areas and potentially decreased the capacity for educators to respond to basic public health needs (WHO, 2016).

"Access to research grants needs to be improved upon and it should be well monitored" (Dean SS University).

Funding is an established challenge, well documented in literature. Until government spend on education is improved, funds diversion and embezzlement addressed, as well as erecting necessary structures for checks and balances, not much progress may be recorded in the education sector.

3.6.2 Poor Infrastructure

Poor infrastructure is a common educational challenge in several LMICs (Matowe et al., 2004; Fathelrahman et al., 2016) and has been attributed to lack of funds, corruption and embezzlement of available funds (Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015; Ololube, 2016), as well as a lack of political will to improve infrastructure. A study conducted in 120 countries found that about 70 countries had grossly inadequate infrastructure (WHO, 2005). One of the major challenges to a fit-for-purpose pharmacy programme according to stakeholders was small and non-conducive learning spaces, inadequate and outdated laboratory equipment and reagents were some of the specific issues mentioned.

"Well, as we are all aware, In Nigeria, the issue of economic situation definitely has affected the profession in terms of the lack of equipment which has affected the quality of research" (Dean NW University)

Many stakeholders (58.1%) disagreed or strongly disagreed that learning facilities and equipment during their undergraduate days were up to date with practice standards. A median rank of 4 indicated a tendency towards the 'disagree' response.

Participants spoke of infrastructural standards declining overtime. Being pharmacists themselves, they compared the quality of pharmacy education when they were in school to that at the time of interview. A few deans elaborated on this and how this had affected the scope of practical examinations possible. This was one of the major reasons students often had to do 'alternative to practical classes' earlier described: where the practical has been pre-conducted, and readings provided to them to analyse. This was done to avoid students struggling for the limited laboratory equipment available under examination conditions in a quest to succeed at the exams.

"For instance I remember when I was an undergraduate these spectrophotometers we had many in the lab so that during practical exams you can be given your tablet and be asked to obtain content uniformity but these days we have just one or two, you would do a kind of semi alternative where you already have your data, you do some arithmetic and work it out theoretically" (Dean SE University)

Other than equipment the study environment e.g., Poor ventilation and seating arrangements were identified as major reasons for discomfort. About 51% of respondents either disagreed or strongly disagreed with the statement that the school environment for pharmacy students is comfortable, inspiring, and conducive for study. A median rank of 4 indicated a tendency for stakeholders to disagree to this statement.

Published strategies for infrastructural upgrade such as regionalizing training institutions (WHO, 2005) in order to pool resources may not work for a highly populous country like Nigeria. This study revealed that some schools in Nigeria managed to upgrade infrastructure by soliciting help from alumni who donated laboratory equipment, renovated laboratories or buildings as needs arose. Pharmaceutical companies also donated equipment, commissioned buildings and in one case was responsible for the infrastructural establishment of a pharmacy school in a public-private type partnership model. One school had been funded by philanthropists and the Tertiary Education Trust Fund (TETFund) and said that their infrastructural challenges were very much in the past. Taking advantage of instituted aid such as programmes that offer volume discounts or free access, especially to training institutions in LMICs, has also been suggested in literature (Aronson, 2004). One of the deans had taken such advantage by partnering with pharmacy schools abroad who would send over their old models of equipment whenever they purchased newer ones, and the dean's recipient school would pay shipping costs for such equipment.

"Then the power issue also, because you cannot do practicals without light, so we bought small, small generators when we have practical period…you want to go to the class to teach, you have prepared your power point and there is no light, you source for batteries. Inverters we have here, the batteries are gone, and no funding, so where will you get money to replace those batteries? It's always a problem so we are devising a way of getting these small projectors you can attach to your computers. You don't need power, the already charged batteries in your laptop can power them. These are some of the challenges we have" (Dean NW University)

Further discussion, however, revealed that lack of infrastructure was not the only challenge but also poor maintenance of available equipment. Participants reported that brand new donated equipment had been poorly handled, abandoned in unsuitable storage conditions and got damaged. The CEO of one of the donor companies who happened to be present in the group exclaimed loudly in shocked displeasure when he heard this. The equipment was quite expensive. Apparently, a new smart board had been abandoned and got damaged in similar manner because no one was willing to bear the comparatively meagre cost of a smart pen. Similar neglect or poor maintenance of public structure and infrastructure has been reported in Zimbabwe (Matowe et al., 2004).

"The faculty has the HPLC but it has not been functioning. The one we had since 10 years, they packed it. Whenever you tell them about it, they will tell you they have not got somebody that will operate it for 7 years now. The same thing happened to our smart board, when the man that taught us about it mentioned about the electronic pen that it was 10,000 naira (about 20 pounds) they packed it there and it spoilt there" (SEFG in academic practice)

It was obvious that the infrastructural status of a school depended mainly on their ability to lobby for available funds, collaborate with alumni, solicit for help from philanthropists or come up with innovative solutions to long-standing issues despite students paying fees to attend. Understanding that ineffective teaching and limited expansion of training are predictable consequences of infrastructural inadequacy (Muula A et al, 2003), there is an urgent need to upgrade infrastructure in pharmacy schools.

An outlier opinion mentioned by just one participant which other participants did not agree to was that pharmacy workforce development challenges faced today were caused by colonization.

"You discover that when the white man came, because they are the people that caused most of the problems, the drug secrets were kept back between the medical officers. What they were having were just dispensers. It was later that the pharmacists just started coming up with much difficulty because to

extract the secrets out of them has been a problem, highly guarded secrets." (Dean SE University).

3.7 Discussion

This chapter discussed the pertinence of education capacity to pharmacy workforce development from a multi stakeholder perspective to provide a richer understanding of this phenomenon in the Nigerian context, while identifying relevant descriptors for this domain as well as how they are reflected and experienced. The freedom to combine qualitative and quantitative analysis made this possible. In this study, factors such as geopolitical zone of practice, sector of practice, and a few other demographics sometimes influenced responses. Participants in education and regulatory leadership, as well as pharmacists practising in the Northern geopolitical zones were likely to have more positive views of the workforce development status than their counterparts. This is likely due to a tendency of leaders to commend personal efforts on the part of participants in education and regulatory leadership and an accepting and non-critical culture among northerners.

This lack of stakeholder consensus while assessing national or regional gaps in pharmacy education has been reported by Anderson et al. (2010). It was acknowledged that stakeholders, who are usually credible sources of locally relevant data (Slavcev et al., 2013), may sometimes confuse and subvert local needs with their own wants, and even when this is not the case, each stakeholder has a different perspective and brings a different angle while answering the research question. These often, polarized views were not seen as different perspectives by pharmacists who decried the perceived dissemblance between the education and practice sectors of pharmacy. This, they said, was likely caused by the closed off university system, policies that prohibited educators from ongoing practice, failure to actively employ teacher practitioners, and lack of opportunities for educator updates on current practice trends. This education-practice gap is common to most health professions and has been reported by other studies (Matowe et al., 2004; Anderson and Futter, 2009; Levy, 2003; Ghilzai, 2008; Kheir et al., 2008). In a few cases where there have been collaborative partnerships between education and practice, it was a deliberate effort.

In this study, pharmacy education capacity was defined as the extent to which undergraduate programmes met global standards while remaining locally relevant. Global standards were defined in terms of curricular similarity and coverage, minimized interschool variation, regulatory consistency, experiential learning, assessment techniques and competencies. Human and infrastructural capacity such as the availability of an adequate number of qualified educators and well-supported students were also major determinants. However, stakeholder responses revealed that the focus of the

pharmacy programme in Nigeria was global relevance, often to the neglect of local health needs. The notion of a 'global pharmacy market' has been discussed by Babar et al. (2013) as well as the importance of international recognition of pharmacy programmes in the LMIC context. Driven by a need to prepare graduates for this market, LMICs often adopt locally irrelevant pharmacy programmes (Jamshed et al., 2007; Babar, 2005; Hadi, 2010; Ryan et al., 2008).

Curricular similarities to HICs meant that pharmacy graduates were not prepared to meet country-specific health challenges. While this seemed tenable to some participants in education and regulatory leadership, who seemed focused on preparing graduates for the 'international market', employers and pharmacists in practice bemoaned graduate competencies. The challenge remains how to attain and maintain the delicate balance between global compliance and local relevance in the LMIC context which will likely ensure a fit-for purpose programme. Incidentally, a sincere desire to meet global quality standards and not just employment standards would lead to fit-for-purpose education because same global standards prioritize local and regional needs (FIP, 2013) above international.

The importance of quality assurance of pharmacy programmes which this study emphasized, has been highlighted by global standard documents (FIP, 2014; FIP, 2016; FIP, 2017), and further established by published research. Several studies (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008) have shown that the slow advancement of pharmacy workforce development has been attributed to regulatory failure; a failure to establish standards (Ghilzai, 2008; Salamzadeh, 2004), failure to enforce established standards (Erah, 2011; Olurinola, 2003), lack of transparency and fairness in accreditation and other regulation exercises. Ways forward may involve raising awareness of the potential gains in quality and relevance that comes with well conducted accreditation, developing mechanisms that help institutions improve their performance rather than simply sanctioning them, and learning from successful practices such as voluntary accreditation (Dussault, 2008), which has been found to increase the commitment of participating institutions (WHO, 2013).

Global collaborative efforts in assisting LMICs may include facilitating information exchange on successful practices (Frenk et al., 2010). Considering that though there is broad consensus on the need for accreditation there is no universal way of doing it (WHO, 2013), yet the responsibility of education to meet societal healthcare needs and protect the public interest is ensured by proper regulation. Hence, government commitment to ensure fit-for-purpose education begins with the establishment and maintenance of an effective and efficient regulatory organization, enacting policies that enforce standards while taking into consideration differences in culture and context (FIP, 2014).

A major descriptor for global compliance of education was sufficient exposure to experiential learning in a wide array of practice environments throughout the course (FIP, 2017) which would address the challenge of a theoretical programme. Pharmacy being a practice-based course cannot be effectively taught theoretically. Research has shown that experiential learning consolidates theoretical concepts learnt in the classroom and builds confidence required for successful practice (Ting, Wong and Thang, 2009; Di-Francesco, 2011; Noble et al., 2014). Yet has not been sufficiently practiced in LMICs due to identified barriers such as lack of training sites (Kheir et al., 2008), medical doctors' resistance to pharmacists' clinical practice (Islam et al., 2014; Lalonde et al., 2011), inefficient co-ordination of activities, lack of pharmacist specialization in the hospital setting. (Erah, 2011; Olurinola 2003), lack of trained preceptors (Hadi, 2010; Jamshed, Babar and Masood, 2007) and infrastructural deficiencies (Anderson et al., 2012; Roush et al., 2013). The concept of learning by doing has been long established by John Dewey (1910) which emphasized the importance of a hands-on approach, knowledge co-construction between teacher and learner, and contextualizing learning to the local setting. This is what experiential education seeks to do. It has been described as liberating (Jeffs and Smith, 2005) in the way that it enables students to understand what is going on in learning. The higher cognitive abilities often involve practical capabilities. Miller (1990) describes these as the ability to 'show how' and 'do.' These cannot be produced by didactic teaching alone. Pharmacy students must be exposed to real-life practice settings to attain these higher cognitive levels which enable them practice confidently and competently afterwards. These experiences must be quality-driven and useful to ensure they are real learning experiences and not just activities that tick a box (Smith, 1994), and identified barriers addressed.

A major challenge identified was workforce shortages, made worse by low incentives to teach, poor educator motivation, poor remuneration, insufficient training and ongoing practice exposure for educators, outdated and inadequate infrastructure, as well as poor working conditions (Chen et al., 2004; Babar et al., 2013; Islam et al., 2014; Matowe et al., 2004) leading to job dissatisfaction. Poor student support was also discussed. These are common to other countries with similar context and have been widely reported in literature (Roush et al., 2013; Singh and Sachs, 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010; Babar et al., 2013; Kheir et al., 2008; Babar, 2005; Ghilzai, 2008; Ghilzai, 2009; Mangasuli et al., 2008; Ikhile and Chijioke-Nwauche, 2016; Mendonça, Freitas and Ramalho de Oliveira, 2017). Some studies have reported these same challenges in the HIC context as well, such as faculty shortages in the USA (Hadi and Hughes, 2009). These are neither novel nor peculiar findings. There is therefore a need to go beyond merely researching the existence, extent or impact of these issues to context-specific workable solutions. Some studies have suggested taking advantage of

foreign aid (Matowe et al., 2004), but this research identifies with the suggestion by Anderson and Futter (2009) as well as Alsharif (2012) and Hadi (2014) to locally and collaboratively develop a model that works. This builds on the development as transformation proposal by UNDP (2002) which focuses on reconstructing education systems with respect for differences in context which may be a more sustainable solution.

These context-specific descriptors for education capacity identified as well as stakeholder perceived status of education capacity in Nigeria are quite useful for evidence-based decision making and policy considerations in a resource constrained setting, and indeed in any setting. They highlight priority areas of focus for the improvement of education capacity, thereby ensure efficient resource allocation in a way that outcomes and output could be maximized.

3.8 Conclusion

Stakeholder responses show that quality improvement of education capacity would likely depend on a globally compliant yet locally relevant programme underpinned by fair and egalitarian accreditation standards, an optimized curriculum, with a particular focus on content relevance and delivery rather than volume, to bridge knowledge gaps efficiently, incorporating sufficient exposure to practice-based learning, useful and timely assessments, globally connected competencies, well-trained educators in adequate numbers equitably distributed across the country, student support, improved infrastructural development of the education sector, among others.

Views on the current status of pharmacy workforce development in Nigeria differed depending on the sector, cadre and geopolitical zone of stakeholders involved. Positive views were generally held by those in academic and regulatory sectors of practice within the leadership cadre, as well as those who practice in the Northern geopolitical zones. Less positive were views held by those in other sectors of practice, as well as those who practice the Southern Geopolitical zones. Despite differing views, there was a consensus on the need to upgrade the current programme to a more patient-focused one which would be more practice- based, clinically focused, and locally relevant, taking available resources, national concerns and priorities into account.

Understanding that the needs-based approach would require multi-stakeholder engagement as well as co-operative and collaborative partnerships within and between institutions, education-practice alliances must be deliberately created. Fora for discussing ideas, reflecting on interventions, and sharing expertise and perspectives involving a dynamic interactive process to ensure shared ownership for decision-making, action taking, and outcomes would be a practical way to go about this.

4 Chapter 4: Professional Relevance

4.1 Introduction

This chapter discusses how professional relevance influences pharmacy workforce development in the Nigerian context. Professional relevance was defined in this study as the extent to which the pharmacy profession or pharmacists contributed to patient care in individual practice or in collaboration with other health professionals, as well as the extent to which education prepared them to do so. This domain was mostly driven by perception of the roles of pharmacists by other health professionals, pharmacists themselves, and the public.

One may argue that the pharmacy profession has always been responsive to societal expectations. A historical premise to the marked transformation of pharmacy from a product-oriented to a patient-oriented practice (Anderson et al., 2010; Breland, 2007) revealed a need for role reinvention to maintain professional relevance. The pharmacy profession originally involved the preparation, handling, and dispensing of medicines and medicinal substances, but with industrialization and technological progress the preparation and handling roles were mechanized, leaving the dispensing role and the monetary transactions that go along with it, (Babar et al., 2013) which alone may not justify the existence of a profession.

Now, pharmacists fill several constantly expanding roles. They mediate access to essential drugs and carry out other healthcare services while maintaining the same goals of improving overall health in collaboration with health professionals. Nonetheless, these revised roles often vary from country to country (Gilbert, 2001) barring social issues such as war, terrorism and political unrest. Countries are at different stages in this transition, also there may be geographical differences in the response to change within countries, amidst several factors which impact the rate of change (FIP, 2013).

With this change has come a loss of professional identity for many pharmacists in the Nigerian context, who are unsure of the specific roles they are now required to perform. In some cases, the singular role of drug dispensing with the accompanying monetary proceedings is what being a Pharmacist entails. In other cases, there are no clear-cut roles, but roles are largely defined by public recognition, other healthcare professionals, and the government (Babar, 2007; Khan, 2010; Lim et al., 2012). In yet others, the move for role redefinition has been successful and pharmacists find themselves taking on increasingly significant clinical roles and offering direct patient care which often leads to conflicts with other members of the health team (Babar et al., 2013). In most cases described pharmacists still go unrecognized as healthcare professionals and are not making visible

contributions to national healthcare (Babar et al., 2013). Key reasons for this have been discussed below. Figure 4.1 illustrates the chapter structure, while table 4.1 shows the frequency distribution for the professional relevance variables.

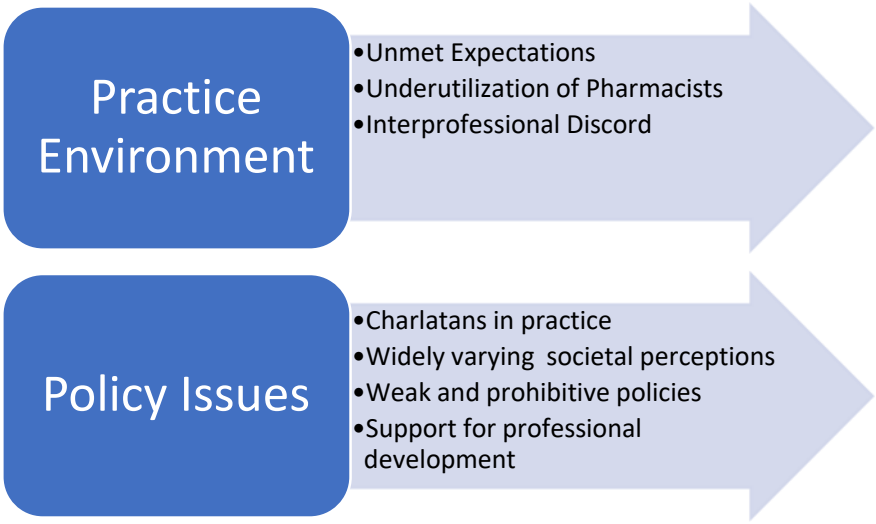

Figure 4.1: Chapter structure

Table 4.1: Frequency table for professional relevance variables

Key for tables below: SA- Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree, N-Count.

S/N	Variable		SA	A	N	D	S
		Rank values	1	2	3	4	5
1.	The BPharm curriculum focuses more on providing scientific information than on skills required for patient-focused practice.	N	387	602	92	158	23
		N %	30.7	47.7	7.3	12.5	1.8
		Median rank					2
		Lower Quartile					1
		Upper Quartile					2
2.	Pharmacy graduates should be able to function optimally in all locally available pharmaceutical practice sectors before specializing.	N	487	645	73	48	10
		N %	38.6	51.1	5.8	3.8	0.8
		Median Rank					2
		Lower Quartile					1
		Upper Quartile					2
3.	I feel supported and encouraged to continually update my knowledge and skills to provide the best healthcare services in practice.	N	394	333	202	245	88
		N %	31.2	26.4	16.0	19.4	7.0
		Median Rank					2
		Lower Quartile					1
		Upper Quartile					4

4.	Artificial barriers have been created to patient access in teaching hospitals that limit pharmacy students' experiential education.	N	487	476	144	115	37
		N %	38.7	37.8	11.4	9.1	3.0
		Median Rank					2
		Lower Quartile					1
		Upper Quartile					2
5.	Clearly set out standards, and pharmacists' roles, would facilitate a fit-for-purpose pharmacy programme.	N	847	383	13	7	6
		N %	67.4	30.5	1.0	0.6	0.5
		Median Rank					1
		Lower Quartile					1
		Upper Quartile					2

4.2 Practice Environment

The pharmacy practice environment in the Nigerian context refers to various sectors within which pharmacists were employed after study. An enabling practice environment hinged on professional identity and recognition, role clarity, professional governance, interprofessional cohesiveness, and ultimately determined the pharmacist's impact on and perceptions by society.

Globally, it is acknowledged that the pharmacy profession faces a challenge with respect to contributing to patient care and improving practice (Tsuyuki and Schindel, 2008). Nigeria is not an exception. Pharmacists were generally disappointed with the practice environment which was not conducive for professional growth and progress. Issues such as a chaotic drug distribution system (Awaisu, Mohammed and Yakubu, 2016) which made it possible for charlatans and non-professionals to handle medicines, and led to over-the counter sale of prescription medicines (Oseni, 2019) and subsequent incidents of drug misuse and abuse, poor regulation and a failure to enforce policies (Erhun et al., 2001), poor remuneration, non-recognition of pharmacists as healthcare providers, amongst several other factors meant that even well-trained pharmacists struggled to make a meaningful contribution to healthcare and overall patient outcomes.

4.2.1 Unmet Expectations

Expectations in this study refer to students' beliefs and assumptions of what the all-round pharmacy practice experience would be like. It was quite normal

to have views on future practice and make plans based on those views. It was clear from this study that the pharmacy practice environment in Nigeria was a terrain of unmet expectations.

Earlier mentioned moves towards pharmaceutical care as a practice model had made a huge difference in role orientation and perspective of the pharmacist (Holland and Nimmo, 1999). As a result, the orientation of professional attitudes and values of students had changed. Pharmacy students were optimistic about subsequent practice while in school, and this motivated their study. They had high expectations, and these ideas came mainly from professional socialization (Wood et al., 1997; Holland and Nimmo, 1999; Chalmers et al., 1995) whereby students learnt about their professional roles and expectations of performance in that role from university faculty members who painted an idealistic picture of pharmacy practice after school. Other sources included public perception, international reputation of the practice, and the high standards which students were held to in pharmacy school. Inconsistent messages, and expectations not being fulfilled resulted in dissatisfaction and disillusionment with the profession (Manasse, Stewart and Hall, 1975).

Professional socialization is influenced mainly by academic interactions, hence pharmacy education is an integral part of the process and needs to play its part. However, practice experience is also an important part of the socialization process (Thomas, Beck and Janer, 1997), and many pharmacy students formed their opinions of what real world pharmacy practice was like from experiential learning opportunities (Abdu-Aguye et al., 2019). Studies have been carried out over several years and a persistent theme that emerged was the development of disillusionment or dissatisfaction with their chosen profession as pharmacy students progressed through the curriculum (Knapp and Knapp, 1968; Schwirian and Facchinetti, 1975; Smith, Messer and Fincham, 1991; Hickey, Dipiro and Romanelli, 2019). Studies in various disciplines have referred to a gap between expectations and reality in higher education (Awang and Ismail, 2010; Resenfield, Oandasan and Reeves, 2011) , however, there is a dearth of literature on the gap between students expectations of subsequent practice and the reality (Ting, Wong and Thang, 2009).

This education-practice mismatch was a major motivator for this study, and participants stated that when they were students, pharmacy was painted as a very lucrative profession and phrases like "*as a pharmacist you can never go hungry*" were frequently used in description. The pharmacy undergraduate programme in Nigeria was described as a rigorous one with heavy workload, hence, pharmacy students had little or no time for sleep or social activities (Ubaka et al., 2015; Adeosun et al., 2008). Participants reported students having classes on Saturdays and Sundays to be able to adequately cover the

curriculum. Given the rigorous nature of the pharmacy programme, many students assumed the programme was worthwhile preparation and would pay off in practice. They eagerly looked forward to their induction as professional pharmacists, and practice afterwards.

Students assumed that immediately after school they would be spoilt for choice as regards employment opportunities, since pharmacist to population ratio in the country was quite high. However, stakeholders' responses showed a huge gap between pharmacy students' expectations of pharmacy practice and reality. This gap has been attributed to overstated practice advantages by faculty members, a prohibitive practice environment; lack of practice role models (Noble et al., 2014), negative attitudes by older pharmacists who perform their roles poorly in largely profit driven community pharmacies (Awaisu, Mohammed and Yakubu, 2016), as well as other practice challenges described below.

"When you go to school, they will tell you all sorts of good things. See the lecturers, they will tell you all sorts of beautiful things. They will tell you that when you finish as a pharmacist, doors will open up for you, contracts, everything!! But we are in practice and it is not the way it is". (NWFG Participant in hospital practice)

Perceptive students said they noticed a conflict because pharmacy practitioners who made such claims didn't seem fulfilled or well off. Their suspicions were confirmed when these students had some practice experience in their third year and were exposed to the realities of the practice environment which did not live up to their expectations. This corroborated research which showed that students form their first opinions of what real world pharmacy practice is like and may decide on career choices during their experiential learning component (Ting, Wong and Thang, 2009; Diack et al., 2014; Burrows, Dall'Alba and Caze, 2016; Mylrea et al., 2018). Students who thought jobs would be lined up for them after graduation, were disappointed when they had to wait for several months up to a year for internship placements due to limited spaces. One participant who was motivated by the affluence of her community pharmacist cousin to study pharmacy, opened one after school and looked forward to same affluence but could not keep the business afloat due to low patronage and pilferage; which has been reported by studies as one of the major drug supply and distribution challenges in Nigeria (Ekpenyong et al., 2019; Irene et al., 2016; Chukwu, Chukwu and Lemoha, 2018).

"As a student I expected a lot from the profession, but most of my expectations came from my lecturers in school but there was a mistake along the line because the lecturers painted a very rosy setting about pharmacy and pharmacy practice. The mistake I made was that I did not also juxtapose their

position with the picture they were painting because most of them were not doing very well but they were telling us that pharmacy was a very wonderful profession; that you would get fulfilment, you will get satisfaction and you will get money, but all those things are not coming as they said it."(SSFG participant in hospital practice)

Some participants passionately criticized post-graduation expectations such as the reliance on government employment which had been extensively discussed by other pharmacists. They attributed the dissatisfaction to this mindset and stated that these expectations were due to a lack of innovation. They further explained that pharmacists must strive to be entrepreneurs and job creators, not job seekers. This, they said, should be the mentality of an educated individual.

"Most of the things we do here are government based, in everything we depend on government. It is only a few things that you can say individuals are coming up…assuming that the orientation is that when you come out, you are on your own, you don't have to wait for government…. I think people will be more satisfied, provided government provides the enabling environment…You would be more satisfied than carrying files and looking for job. You will even help to create jobs for people that have not found their feet. But in our case, we join the people that are waiting for job from government only few, if you look round now maybe he is the only one (pointing to another focus group participant) that is a self-reliant person. Assuming government said they will not pay us again, most of us will go hungry." (NWFG participant in hospital practice)

Further interviews revealed that participants thought the level of expectations as well as this job-seeking rather than job-creating outlook were a direct result of the curriculum design, and level of thinking students were able to attain due to the quality and scope of education provided. One dean referred to Bloom's taxonomy (Bloom et al., 1956): a multi-tiered model of classifying thinking according to six cognitive levels of complexity (Forehand, 2005). Often depicted as a stairway, so the goal of education would be to encourage students to attain higher levels of thought (see figure 4.2). The lower three levels are knowledge, comprehension, and application, the higher three are analysis, synthesis and evaluation. The levels are hierarchical, and each lower level is subsumed in the higher in a way that a student operating at the 'application' level has also mastered the knowledge and comprehension levels. In his opinion, the Nigerian educational system only enabled graduates attain the third or fourth level of thinking. This opinion was shared during the focus groups and participants agreed.

"because of my own personal knowledge of the Bloom's taxonomy and educational curriculum, the curriculum in Nigeria has a limitation, it is a Nigerian problem, when I did an assessment of our curriculum viz a viz Bloom's

taxonomy and other educational philosophies, alright, I saw that our curriculum in Nigeria at best only takes us to the third or fourth level (and there are 6 levels in that pyramid), which is the level of decision making process it does not take us to the level of synthesis, it doesn't take us to the level of creativity, that is why the bulk of our graduates just leave the university to render services they don't leave the university to become creative which of course should be the case" (Dean SS University)

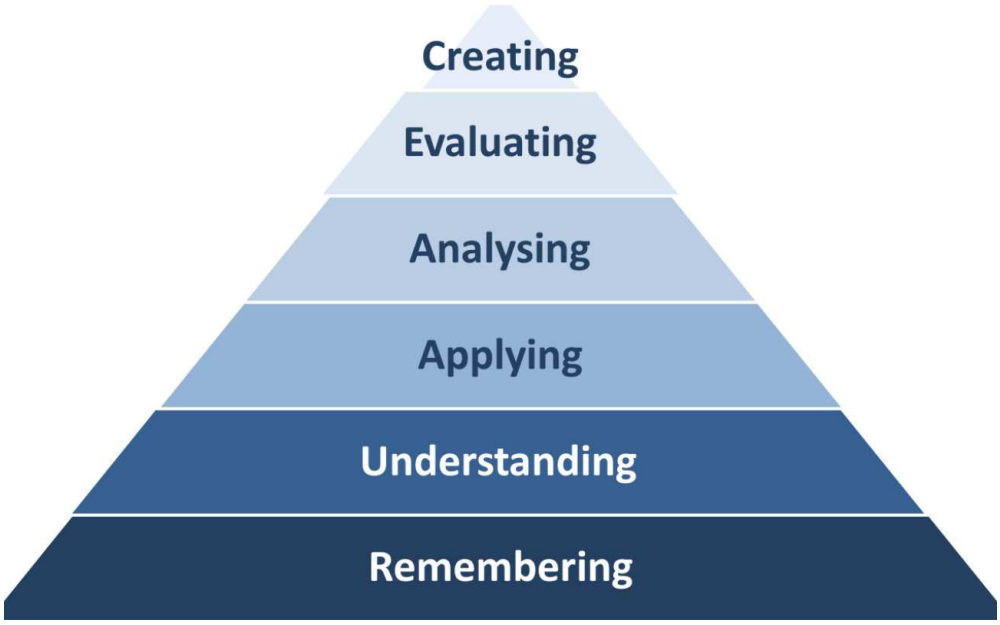

Figure 4.2: Bloom's taxonomy of learning

It was interesting to find out that all participants spoke of unmet expectations. Not one participant reported that their practice experience met or exceeded their initial expectations while in school. These expectations were therefore too high or practice realities too poor to measure up.

In which case, educators will do well to desist from promising the unattainable and ensure that students are aware of the limitations of practice and what is realistically obtainable. An open, unbiased conversation on future practice with full student engagement may be useful especially in cases where students have unrealistic expectations of practice. Full transparency is critical to ensure students are not let down. In the same vein, an enabling practice environment should be a national goal. Systems and policies must be in place for the attainment of this goal.

4.2.2 Underutilization of Pharmacists

Globally, it has been recognized that pharmacists are still underutilized in primary care (Scanlon et al., 2018) and various other sectors, despite being the most accessible healthcare providers and first port of call for health services (AlGhurair et al.,2012). This may be because traditionally, pharmacy had attributes such as autonomy and service-orientation which may have

hampered its visibility, and caused marginalization to the extent that at some time it was regarded a quasi-profession (Knapp and Knapp, 1968; Shuval and Gilbert, 1978) and this is still the case in many LMICs (Babar et al., 2013). Role ambiguity (Babar, 2007; Khan, 2009; Lim et al., 2012; Babar et al., 2013) and an adversarial-type relationship with medical doctors (Lalonde et al., 2011; Islam et al., 2014) have also contributed to this. Research has reported the perceived status of the pharmacist to be well below that of their medical colleagues (Lim, Anderson and McGrath, 2012).

During focus group discussions in this study, the phrase "overtrained but underutilized" was frequently used by participants to describe the realities of pharmacists in practice. This was especially the case with hospital practice where participants complained about pharmacy duties being restricted to dispensing medicines while they were trained for more clinical involvement with patients in hospitals such as ensuring the uninterrupted supply of quality medicines, managing and monitoring medicines, optimizing effective choices and promoting rational use, thereby possessing the ability to improve health outcomes of patients (FIP, 2012). A review conducted by Babar et al. (2013) revealed that several studies acknowledged a lack of recognition for the clinical role of pharmacists in LMICs (Ahmed and Hassali, 2008; Jamshed and Babar, 2009; Mangasuli et al., 2008; Ablsoul-Younes et al., 2008). The simple act of dispensing medicines, inventory control, and associated financial transactions meant pharmacists found themselves overtrained for what they did and underutilized for what they knew (Gilbert, 1998; Auta et al., 2014). A survey conducted in Nigeria showed that only 2 (4.3%) hospitals (of 47 surveyed) had pharmacists participating in ward rounds with other members of the healthcare team (Suleiman and Onaneye, 2011).

"I think as a pharmacist I can say that pharmacists are overeducated and during practice we are underutilized, in the sense that we are taught a lot of things in our curriculum that during practice you find nowhere to implement those things that you were taught". (NWFG participant in academic practice)

This resulted in a loss of identity for pharmacists (Bisell and Morgall-Traulsen, 2005; Edmunds and Calnan, 2001). Professional identity is an old concept and can be defined as the understanding of the social impact of one's profession and the significance of one's work (Moore and Hofman, 1988). The development of professional identity is a dynamic process that links the job role to clear self-perceptions, sometimes including the perception of others, and it gives meaning and orientation to one's profession (Hirschi, 2012). Professional identity is understood to develop partly through socialization, a process which may begin in school but carries on throughout the career (Pratt et al., 2006; Cruess et al., 2015; Joseph et al., 2017). In this study, pharmacists reported that they did not have a healthy sense of identity for several reasons such as role ambiguity, underutilization, societal perceptions of a pharmacist

which were also influenced by charlatans and non-professionals practising illegally, amongst others.

This loss of identity has also been attributed to the move towards "reprofessionalization" with a focus on providing clinical services and patient care in healthcare settings (Gilbert, 1998) which doesn't seem to have been properly adopted or embraced by other health professionals in the LMIC context. Stakeholders expressed strong views concerning the underutilization and marginalization of pharmacists by the medical profession especially in the hospital practice setting, to the extent that they advised newly qualified pharmacists against going into hospital practice, stating that it could be demotivating and negatively influence their opinion of pharmacy practice. Roles of clinical pharmacists taught in school such as patient counselling, therapeutic drug monitoring and rational use of drugs were mere classroom theory and could not be found in most hospital practice (Awaisu, Mohammed and Yakubu, 2016; Erah, 2011; Olurinola 2003). In similar patterns of marginalization, there were also cases where pharmacists were made subordinate to military pharmacy technicians. This was supposedly for learning purposes since these technicians had more experience having worked long years in the hospitals, but this subordination remained even after the initial orientation.

" I found out that all I was doing was to count out medicines, when I was serving at the hospital and all I was saying was eyokan lojumo, meji lojumo (translated, take one tablet daily, take two tablets daily). I kept saying it. That was my chant, day in day out, I wondered….is this where I will end up? And many interns I supervise, when I go to visit them in the hospital, they tell me it is the same thing today. Whenever I go to visit the interns, I feel very sad because they are not happy at all with what they are doing…some of them are even working under pharmacy technicians because they are doing internship in the Military hospitals or Navy where the uniformed person is the 'Oga' (head), so even if the uniformed person is the least qualified, it does not matter" (SWFG participant in regulatory practice).

Respondents in the quantitative phase had similar views with 97.9% of stakeholders agreeing or strongly agreeing to the statement that clearly set out standards and pharmacists' roles would facilitate a fit-for-purpose pharmacy programme. A median rank of 1 indicated a tendency for stakeholders to strongly agree to this statement.

A few hospitals with advanced practice standards were an exception to the general pattern of underutilization. This was public knowledge, so the competition for pharmacy graduates to practise there after school was stiff. It was agreed that the quality of practice varied across hospitals and was often determined by hospital leadership. It was obvious from discussions that clinical exposure, and direct access to patients during ward rounds was one of the major factors that made for good hospital practice (Erah and Nwazuoke, 2002; Oparah and Eferakeya, 2005). Others included educational clinical meetings, appropriate patient counselling sessions, and pharmacists' consultation on patients' medication therapy.

"During my clerkship experience, I was posted to a hospital. It was a very wonderful place. That is the honest truth. You go on ward rounds with the consultants, the physiotherapists, and the medlabs. They ask you questions, your opinions are relevant, and they recognize your interventions and contributions. They make you feel like you are actually knowledgeable in this field. They assign a patient to you, you do the whole pharmaceutical care, you make presentations. It was interesting to me, I felt very into practice, I loved every aspect of it." (SWFG participant on internship)

Many participants wondered why hospital practice could not be standardized across the country, having practiced in different geopolitical zones and had totally different practice experiences in each. In a frequently occurring pattern of favour based on familiarity (Aleyomi, 2013; Okolo and Okiemute, 2014), the quality of the hospital pharmacy practice was mostly dependent on how "connected" the pharmacy leadership was and how much they could lobby for relevance and a seat on the leadership table. Hospital practice standardization is necessary for equitable access to essential medicines and can be attained by sharing best practice. This has been recommended as a global standard for pharmacy (Anderson et al., 2008; Anderson et al., 2009).

"Then, another thing I found out is that there was no one standard for hospital pharmacy, these four places I worked in had different systems, different foci and it was not working. I think there should be some harmonization of what a hospital pharmacy is supposed to be. Yes, we have some things on paper, but there is no enforcement in practice and that is why you may come to hospital A and pharmacy is not regarded and you go to hospital B that is not too far away and pharmacy is well regarded, yet we are all licensed the same way". (SEFG participant in hospital practice)

Considering the poor health status in many LMICs where pharmacists' underutilization occurs, there is a need to optimally engage available health workforce expertise across all cadres and areas of specialization. Due to differences in context, understandings and perceptions, it may be difficult to

identify a singular uniform professional identity for a 'good' pharmacist (Cameron 2011; Baker et al., 2011), but an understanding of and respect for the roles and capabilities of the pharmacy professional may aid policy formation (Alefan and Halboup, 2016) for maximum utilization, towards provision of needs-based services.

4.2.3 Interprofessional Discord

In recent times, the complexity of patients' healthcare needs require a multidisciplinary team of health professionals to adequately address these issues. As a result, there is a move towards collaborative practice which relies on a joint understanding of one's own as well as other team members' competence or knowledge and skills to improve patient outcomes (Drinka and Clark, 2000). However, doctors have not been willing to collaborate with pharmacists for the achievement of set health goals (Auta et al., 2016), despite abundant evidence on the benefits of pharmacists contribution to the health team leading to improved patient outcomes (Al Hamarneh et al., 2011; Chisholm-Burns et al., 2010; Khalili et al., 2012; Khan et al., 2015; Loewen et al., 2010). Underutilization was often caused by interprofessional discord rather than a lack of knowledge of the extent of the pharmacists' capabilities. Possibly because the pharmacists' role which was limited to compounding and dispensing prescriptions previously has been redefined (Ibrahim and Ibrahim, 2014), and doctors feel pharmacists are encroaching into their distinctive role of patient care.

The poor condition of the health system, reported by participants, was not helped by a seemingly adversarial relationship among healthcare professionals in the country. There was a sense that doctors owned the patients and any health professional providing expert care must only do so at the instruction of the doctor. In other LMICs, physicians' attitudes have been identified as a major barrier to the expanding roles of clinical pharmacists (Islam et al., 2014; Lalonde et al., 2011). A study carried out in Jordan to determine doctors' perceptions of pharmacists' clinical roles (Tahaineh et al., 2009) revealed that though pharmacists were perceived to be a reliable source of medicines information and expertise, only 16.3% of doctors reported being comfortable with receiving input from pharmacists on prescribing medicines. Several other studies have highlighted that doctors are uncomfortable with pharmacists participating in direct patient care or clinical rounds, suggesting, or recommending medication to their patients (Ables and Baughman, 2002; Matowe et al., 2006; Bryant et al., 2009).

In Nigeria, other than neither seeking nor reckoning with pharmacists' medicines expertise, medical doctors also prevent pharmacy students from having access to patients in hospitals for clinical training and experiential education. When students do have access, they do nothing more than

observe as was reported by Chase (2007). In many cases, pharmacists were also not allowed to have direct contact with patients in hospital to provide therapeutic management. This was a huge problem, while it served as a barrier both to students' learning and pharmacists' clinical practice, it also created an atmosphere of animosity in many cases (Ibrahim and Ibrahim, 2014) and most unfortunately prevented patients from getting the best collaborative care available to improve their health outcomes.

"…now the pharmacy students cannot even enter the wards because doctors will not allow them, there is politics in that area, so that is a big challenge" (SSFG participant in hospital practice)

The enormity of this challenge was reflected in pharmacists' responses 76.5% of respondents either agreed or strongly agreed that artificial barriers have been created to patient access in teaching hospitals that limit pharmacy students' experiential education. A mean rank of 2 indicated a tendency for respondents to agree to this statement.

This was also the primary reason why more than half (54.7%) also stated that medical doctor's resistance was the major barrier to the implementation of the PharmD as will be discussed in the next chapter. Clearly there was need for re-orientation of doctors towards interprofessional collaboration.

4.3 Policy Issues

Public policy plays an important role in shaping pharmacy workforce development by determining human capital investments and creating incentives for development. They define areas in which decisions can be made and provided a guide for such decision making (Okoroma, 2006). They are useful for resource prioritization and to assess the effectiveness of actions taken by frontline agencies, influence and support decision making by local services and the community. Newly industrialized nations that have increased their development capacities have made specific institutional and policy choices. These include substantial prior investment in human resources: the nature of higher education (Stern et al., 2000), protection of intellectual property, evolution of research and development and the division of labour between private industry, universities and government in research and development performance and funding (Nelson, 1993). In the same vein, social issues which have escalated to national crises have been as a result of weak and non-implementable policies or poor enforcement (Oseni, 2019).

Understanding that the formulation of policies sets the stage for implementation which has been described as the most important step in national planning (Ukeje, 1986), stakeholders were concerned that government policies on workforce development were concentrated in the ministry of health where governance and capacity are weak (Nyoni and Gedik, 2012) and often not favourable to the pharmacy profession. The proliferation

of charlatans in practice and the public health issue of fake and sub-standards medicines were policy failure examples.

4.3.1 Charlatans in Practice

'Charlatans' was used to describe people who illegally sold and distributed medicines, mostly fake or substandard medicines (UNODC, 2010). In Nigeria however, counterfeit drugs include falsified and substandard drugs as well as substances that are not properly registered (WHO, 2005).

The WHO set up a global programme on poor quality drugs in 2006 focusing on Africa. Nigeria has been a key player in these debates, since it has been a place where the problem of fake drugs is particularly accentuated. In the early 2000's it was reported that 60% of the drugs in Nigeria were fake (NAFDAC, 2013). Explanations for this high percentage have mostly been speculative rather than empirical. They speculate that users are poor and uneducated, they do not understand the risks of consuming such drugs (Adjei and Ohene, 2015; Warsi, 2016). Others include that drug counterfeiting has become sophisticated and militarized by organized criminals who have taken control of the trade (OECD, 2016). It has also been argued that the state on the global south is too weak to regulate the importation and distribution of counterfeit medicines.

Due to the potentially lethal effects of fake drugs and their contribution to wider health and social problems such as antimicrobial resistance (Newton et al., 2006; Davies, 2013; Dukes, Braithwaite and Moloney, 2015) this challenge of charlatans is of national and global importance.

In this study, when asked about specific practice challenges, participants often spoke about non-professionals handling drugs. This singular issue was the cause of several challenges described by stakeholders such as the chaotic drug distribution system (Awaisu, Mohammed and Yakubu, 2016), the sale of fake and sub-standard medications earlier mentioned (Larson and Fick, 2009), poor antibiotic stewardship leading to resistance (Tenova, 2001; Ventola, 2015), general drug misuse (Okeke, 2006), non-recognition of pharmacists (Scanlon et al., 2018) who are often assumed to be the same as charlatans, among others. The pharmacy profession was described as the most encroached upon profession due to poor regulation. Similar regulatory issues have been reported in several other LMICs (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008), and education regulation challenges discussed in chapter 3. Practice regulation was an even bigger challenge as reflected by the existence of these charlatans in the first place.

"But if we look at the practice area, pharmacy practice needs a sort of security around it because pharmacy profession is the most encroached profession and that is why the practitioners usually have less satisfaction. In every area of

pharmacy practice, unknown professionals have encroached, and they are doing more harm and competing with the professionals. That's an aspect where our regulatory authorities need to look at it and build security around our profession so we could have a grasp on our profession." (NWFG participant in academic practice)

Survey responses confirmed the urgent need to address these challenges (see table 4.2) with 55.8% of participants stating that drug misuse and abuse is the most urgent healthcare challenge and 32% selecting charlatans in practice as the challenge to be most urgently addressed.

Table 4.2: Challenge to be most urgently addressed in pharmacy practice

Rank Value	Option	Count	Descriptive Statistics
1	Antibiotic Resistance	116	Mode 3
2	Emerging Infectious Diseases	36	
3	Drug misuse and abuse	697	
4	Charlatans in practice	399	
	Total (N)	1248	

Charlatans in practice are and have always been a major challenge to an enabling practice environment in Nigeria. Through close relations with industry, a focus on product registration and widespread public information campaigns, NAFDAC was able to reduce the availability of fake drugs in the market. This progress was not sustained however due to larger political economy issues such as the decaying public healthcare system, the decline of the local pharmaceutical industry, as well as the unfavourable terms of global pharmaceutical trade, brought on by the commodification of health (shift from public healthcare towards private profit-making and wealth) (Whyte, Van Der Geest and Hardon, 2002) none of which were within its control. Until these wider issues are handled, the problem of charlatans distributing counterfeit medicines may persist in Nigeria.

4.3.2 Widely Varying Societal Perceptions

As far back as 1994, international standards were set by WHO (1994) for expected pharmacist roles as a communicator, quality drug supplier, trainer and supervisor, collaborator, and health promoter. More recently it has become difficult to define the role of the pharmacist due to fast-paced advances in healthcare, differences in context, overlapping roles with other health professionals, increasing public expectations, among other factors. The role of a pharmacist is changing and continues to change in line with needs and expectations of patients and service users. This lack of role clarity means that effective education and training as well as future workforce planning may be difficult. Role ambiguity may also lead to an increased interest in public perceptions of the profession.

Following role reinvention due to the paradigm shift in practice, the pharmacists role as a primary care provider has been largely embraced in all sectors of practice and across many nations, and the term “pharmaceutical care” has been used in many LMICs to emphasize the patient focused roles of pharmacists (Babar et al., 2013). In High Income Countries (HICs) patient focused practice has been largely embraced, and pharmacists have moved on to expand and develop more advanced roles within modern health systems (Giberson et al., 2011; McMillan et al., 2014) such as prescribing within general practice, as well as other settings. Conversely, in the LMIC context, pharmacists’ contribution to the healthcare system has been hindered by aforementioned factors. In many LMICs, there are no clear-cut roles but these are largely defined by public recognition, other healthcare professionals, and the government (Babar, 2007; Khan, 2009; Lim et al., 2012). This role ambiguity often makes it difficult to determine a suitable training programme for pharmacy students.

Perceptions refer to the expressed views and opinions of a group of people on a particular topic, allowing people to make subjective assessments of objective conditions, which was the case regrading pharmacists’ identity or the pharmacy profession in this study. The professional value of the pharmacist’s requisite skills lies not only in quality education and the possession of required skills but also in how patients and the general public perceive it. However, this should not be the sole criterion for attaining professionalism. There should be a balance between the importance of perception and the value of objectively maintaining quality standards regardless.

Stakeholders understood that in the Nigerian context, as well as several others, clients ultimately give any occupation the power and support it needs to establish itself as a true profession (Johnson, 1972). Hence, they were concerned about the widely varying societal perceptions of the pharmacist against the backdrop of earlier described deprofessionalization (Denzin and Mettlin, 1968; Young and Prichard, 1985) and subsequent role redefinition. They wondered if the public perceived the pharmacist as a highly trained and knowledgeable healthcare professional who plays a vital role in the provision of primary healthcare services, or simply as a shopkeeper selling drugs instead of newspapers. Stakeholders spoke of varied societal expectations and perceptions of the pharmacist and the pharmacy profession.

According to stakeholders, some perceived pharmacists to be wealthy elites who often practiced independently and made lots of money from the sale of medicines. Some participants felt that this societal perception played a part in building up the pharmacy students’ practice expectations as earlier discussed. There were stories of instances where parents prevailed upon their children to study pharmacy as a way to lift the family above the poverty borderline, or

to improve family prestige. Some were more specific in their goals and told students that the purpose of study was to open a community pharmacy store afterwards. Such students claimed they had no personal expectations while in pharmacy school. One commented, *"I went through pharmacy on autopilot."*

Many in fact studied pharmacy only because their parents asked them to do so.

"I come from a family of people who studied pharmacy and they told my father 'let her study pharmacy, once she graduates, open a pharmacy shop for her, she is making money for you already'. That was the idea, so I came into school and everybody was going with me "(SWFG Participant in Public Health Practice)

The admission pressure brought on by this perception of pharmacists as wealthy elites became a national crisis. During the interviews, several deans spoke of the admission pressure as one of the major challenges associated with the office of a dean. Calls from parents of prospective students, political and religious leaders pleading with them to offer admission to study pharmacy was challenge enough on one hand, and a recently released official document with a cap on student admissions was both a relief, since this legitimized their need for refusal, and a further challenge because admission numbers were fixed. With the economic situation of the country and the high unemployment rate, courses where you can be self-sufficient afterwards are often preferred. Students who were compelled by their parents to study pharmacy were often disinterested and had a tendency to become a negative influence on other students.

"The simple truth is this- in most pharmacy schools, we find out that more than 50% of those that are there are there not because they have passion for the course, but because they are influenced to be there by parents or guardians, and those ones because they have the means, they end up influencing the real ones, the ones that went there with passion, and end up diluting their interest which doesn't help us" (Director in Regulatory Organization)

Conversely, a few participants had never heard the word "pharmacy" until they applied and were offered admission to study pharmacy. They reported that pharmacy may not be viewed as a full-fledged profession that commands and fulfils a legitimate role in the primary care team, hence its obscurity. This poor public image has been reported by Matowe (2002) and Norris (2003). There were several communities without a pharmacist especially in rural settings, and many hospitals where the roles of drug dispensing and counselling were carried out without a pharmacist (Awaisu, Mohammed and Yakubu, 2016). Babalola and Olayiwola (1998) showed that pharmacists were perceived to be impersonal in approach, not community focused, and as

commercially oriented as patent medicine sellers. Several stakeholders reported that these perceptions persist in many rural settings and related stories of how they frequently had to educate members of the public and patients on the roles of pharmacists and how these differ from those of doctors. Participants felt that if the public believed pharmacists were dispensable, then the pharmacy profession may likely not be contributing meaningfully to national healthcare (Babar et al., 2013).

"I grew up in an environment where there was no pharmacy, I had never heard of the word pharmacist even as at SS2 (UK year 11)……so I went there and what they offered me was pharmacy, so I attended the orientation class and that was the first time I saw people called pharmacists. They told me what pharmacists were about and that even one of the highest paid persons in America is a pharmacist, so I started becoming interested" (SWFG Participant in community practice)

Other studies have reported contradictory ideas about the profession, weak conceptualizations, a superficial understanding of their roles leading to low expectation (Cavaco et al., 2005). This high variability of opinions may indicate poor identity distinction for pharmacists in the contexts studied. Oparah and Iwuagwu (2001) reported that while Nigerian pharmacists were perceived to be knowledgeable healthcare providers, they were predominantly viewed as traders. Truter and van Niekerk (2001) reported similar results from South Africa : the conflict between the pharmacists' professional functions and commercial interests especially in community practice potentially weakened the claim to professionalism, and the public also often could not distinguish between the pharmacist and the pharmacy attendant.

In an attempt to describe how professions attain sustained recognition and prestige, Haug discussed the concept of 'expert knowledge' which should be exclusive to that particular profession and which forms the basis of a relationship with the client (Haug, 1977). The protection of this exclusive knowledge was the basis for professional distinction and a mechanism used by professions to defend their position and status. This may explain doctors' reluctance to support pharmacists' clinical practice as earlier discussed. Johnson (1972) stated that a 'mystique factor' and some measure of 'social distance' are required to maintain a power dynamic which provides the professionals with the opportunity for autonomous control over their practice . In other words, the inability of the public to challenge the professional's knowledge allows the "professions to set up formal mechanisms which ensure their continued social control" (Denzin and Mettlin, 1968). The power of any profession then is indirectly bestowed upon it by its clients and its continued survival and acceptance is therefore dependent upon the lay public continuing to sanction this power relationship. The relevance of the profession is best assessed in subjective terms because what really matters is how people

experience the services (Gough and McGregor,2009; Coulthard et al., 2014). This may explain pharmacists' concern with societal perceptions of the profession. The need to know if it possesses the necessary power, knowledge and hence social support to ensure its continued monopoly over the sale and provision of medicines, and any extended role which it may choose to take on. Is it perceived as being built upon an expert knowledge, providing an altruistic service to its clientele, requiring a high level of educational achievement for registration, and are the public aware of the profession as a whole and its ethical code? Are pharmacists able to maintain both social distance and the mystique factor, while still being accessible and showing empathy to patients? It is the answer to these questions that helped to gauge the extent to which pharmacy qualifies as a true profession in the eyes of the people it serves. While the profession and its members may be aware of the period of 'deprofessionalisation' and the subsequent need to 'reprofessionalise', it was vital that this should not be perceived by the public, and pharmacy should still enjoy the mystification and social distance so vital for its continued prosperity.

Understanding that the subjective judgements of the public matter regardless of the objective circumstance (Coulthard et al., 2014), how the society perceives the pharmacists may go a long way to determine if expanding clinical roles and services would be well accepted. This was understood in Malta and a survey conducted (Cordina, McElnay and Hughes, 1998) revealed that the proposed extended community pharmacists' role was accepted by patients. Similar acceptance of expanding roles was observed in Palestine (Khdour and Hallak, 2012) though only 17% of respondents viewed pharmacists as drug experts who are committed to caring for the public. However, in both cases, the expanding clinical roles would have been counterproductive without patients' trust.

4.3.3 Weak and Prohibitive Policies

Government policies determined the relevance of the pharmacy profession relative to other health professions and were implicated throughout this research in challenges discussed, though specific policies were not mentioned. A study carried out to evaluate pharmacy practice policies in Nigeria (Oseni, 2019) revealed that existing policies were inadequate to regulate the practice of the pharmacy profession. Most professional issues highlighted were tied to weak or unhelpful policies for pharmacy practice.

"Clinical pharmacy for example, we feel like we are gate crashing to some extent, the legal framework is still very weak on pharmaceutical care, the political support is still weak even though they are trying, there are a lot of improvements at professional level however the nitty gritty on the policy is not on ground. As far back as 1990, everything that happened in development has

been an offshoot of policy ……..like I said the policy is still very weak so we make local arrangements, and logistics; it's frustrating" (Dean SS University)

Weak policies and political support were made even weaker by poor implementation which has been described as the major problem with the policy process in Nigeria (Ukeje, 1986). Poor planning (Adesina, 1977; Okeke et al., 1985; Ukeje, 1986), lack of political will (Okoroma, 2006), corruption (Adesina, 2004) have been identified as causes of the implementation bottleneck. These have implications for national development. There were notions of wilful non-implementation of national policies by principal officers (especially in government establishments) due to a lack of proper work ethic and indiscipline. Government officials were expected to offer quality services to all users (Adetunji, 2014) but this was often not the case in Nigeria where bureaucracy, inefficiency and favouritism (Adetunji, 2015) were quite common in civil service.

Access policies which should foster national unity and diversity have become ineffective due to quota system, catchment area and federal character. These practices prioritize geopolitical zoning over student merit, hence, the best students do not necessarily get into pharmacy schools of their choice, thereby creating inter-tribal and geopolitical tensions. Some states are classified as educationally disadvantaged and indigenes of those states granted admission with lower cut-off marks than others. All these create inequities and do not foster national unity.

Policies on lecturer training in the national policy on education (NERDC, 1998) is yet to be implemented. An interview with an education director revealed there are no such training programmes available, but educators have been encouraged to seek development of their own accord at personal cost.

"No, for now we don't have any training. But we are also aware that the NUC actually encourages them to go for education-based training to help their teaching because teaching is a different ball game" (Education Director 1).

The broad definition of policy (Awokoya, 1981) includes the ability to be enforceable and enforced by the society which formulates it. However, many offences were not captured and when captured, penalties were inadequate to make necessary correction to offenders (Erhun, Babalola and Erhun, 2001). A literature review carried out by Okoroma (2006) revealed that ineffective policy implementation was the major reason for the poor performance of the education sector in Nigeria. It was acknowledged that much progress has been made within the pharmacy profession, but this progress fell through at the implementation stage. In addition to weak policies and non-implementation, participants spoke of specific policies that had hampered professional development such as policies around recruiting teacher practitioners which required a minimum PhD qualification for them to teach

students (Adetunji, 2015) when it was a well-known fact that very few pharmacists outside of academia would undertake a PhD. According to stakeholders, this policy had drastically reduced the pool of potential teacher practitioners and discouraged a lot of experienced pharmacists from applying. Meanwhile the need for teacher practitioners to bridge the education-practice gap has been established earlier in this study.

"*But I must say for now the universities are not fully co-operating because the policy on somebody being in the system does not really encourage that, because they will insist that you must have a PhD for you to be considered, except when someone is ready to give pro bono service. Just give free service, if not when you want to be involved and remunerated for what you are doing, it's difficult so that discourages the actual practitioners from being part of the training" (Director in regulatory organisation)*

The urgent need for teacher practitioners was caused by another prohibitive policy that prevented academics from seeking professional experience in other areas of pharmacy practice. This was why academics were often out of touch with practice and courses did not reflect recent practice. This was peculiar to pharmacy which participants regarded as unfair, considering that medical academics were free to practice and teach.

"If not for the policy that we have in Nigeria, you will see that most of the pharmacists actually will have worked in the community pharmacy…. At the end of the day, you now try to see from your knowledge of what is happening outside the kind of knowledge that you want to give your students. That is why some of us have been battling for a long time, there's this argument we have with the Pharmacists Council of Nigeria for example to allow academic pharmacists upgrade, for example, in community pharmacy. If they do so they can really understand the needs of the society and then they can translate same to what they are teaching" (Dean NW University)

These policies may have served well in the past, but considering the identified education-practice gap, they may need to be reviewed. Having considered stakeholders responses, policies may not only be weak and unfavourable but also rigid. Lindblom (1959) stated that good policies should not be rigid but amenable to change to suit human needs as they arise within the organisation after the policies have been made. The policy making process itself being one of successive approximation to some desired objectives, in which what is desired itself continues to change under consideration. Lindblom stated that a good policy should be one that can easily be reviewed, or the policy may affect some other useful function of the system. Which was occurring here with students' practical knowledge being restricted by rigid policies. Participants also thought that pharmacists had little or no knowledge or interest in the process of policy implementation and this had negatively impacted on their ability to influence policy at the government level to their

favour. They reported that the nature of the pharmacy program and how the curriculum was structured did not encourage students to engage in politics. This, they thought, was the reason why very few pharmacists aspire for leadership in the health sector or any cadre of government.

"…..that's where the process of policy making comes into place and in that regard I think that one area pharmacy in general is lacking we don't have a sound knowledge of how policies are being made and implemented in the society generally and to an extent it stems from the structure of our curriculum…we need to go beyond pharmaceutical knowledge into policy, management, and understanding all those basic things." (SSFG Participant in Community Practice)

This view was reflected in the survey (see table 4.3). Just 20.6% thought the curriculum had prepared them to a great or very great extent with competencies in policy and implementation science. A median response of 3 indicated a tendency towards the 'to a moderate extent' response.

Table 4.3: Extent to which curriculum prepared pharmacists with competencies in policy and implementation science

Rank Value	Option	Count	Descriptive Statistics
1	To a very great extent	66	Median Rank 3
2	To a great extent	191	Lower Quartile 3
3	To a moderate extent	421	Upper Quartile 4
4	To a small extent	347	
5	Not at all	227	
	Total (N)	1252	

While carrying out this research it became obvious why stakeholders could not specifically discuss policies because official documents clearly itemizing these policies were so difficult to come by. Policy knowledge was often passed from one person to another. The importance of information brochures about the broad objective of why the policies are formulated was also mentioned. This should be available to guide everyone involved. Hauwa (2012) highlighted the need for policies to provide proper directions that can be used to coordinate different actions towards attainment of desired goals.

There is an urgent need to review policies that no longer meet education and social needs and enact flexible ones which can respond to long-festering problems of access, quality, financing, governance and management within pharmacy workforce development in line with global best practices. Following an extensive review of the Nigerian national policy on education fashioned after the American system, Okoroma (2006) recommended a discontinuation of this policy or a review in line with the Asian model which takes the culture and specific needs of the people into consideration. Policies should not only

be formulated, but that also need to be communicated, programmed, evaluated and monitored, if the policy is to achieve the purpose for which it was established (Koontz and O'Donnel, 2005).

4.3.4 Support for Professional Development

Continuing professional development (CPD) and in-service training of pharmacists are necessary and should be relevant to the evolving healthcare needs of the community. Having established the importance of undergraduate pharmacy training to the development of a competent and confident pharmacist in the previous chapter, this study has also shown that universities function amidst several limitations such as funding insufficiency and staff shortages. Given the short period of time allotted to undergraduate study, and the rapid evolution in pharmacy practice (WHO, 2006; Frenk et al., 2010), students are simply unable to learn all that they require while in school (Jones et al., 2001). Exponential progress in technology, diagnosis and treatment methods as well as changing population demographics and disease burden make updating and maintaining knowledge and skills of pharmacists throughout their professional life important and highlights the need for the invaluable skills of lifelong learning and change agility (Wilson et al., 2005).

Following this realization, systems have been put in place for education throughout practice. Previously this was undertaken through continuing education (CE), but following studies that showed the ineffectiveness of continuous education to influence pharmacists behaviour (Davis et al., 1995, Davis et al., 1997, Davis et al.,1999; Thomson et al., 2001), the CPD approach is now employed which involves a circle of reflection, planning, action and evaluation (Rouse, 2004). CPD refers to educational activities conducted after graduation to maintain improve and adapt knowledge, skills and attitudes of health professionals so they can continue to safely and effectively provide health services. The need for continuous improvement was also highlighted by stakeholders in this study.

"I believe the professional bodies must ensure that the quality of our products are continually improved upon because the graduates that are coming out are going to face a more competitive world both within the health professions and in the allied professions" (Dean SS University).

Evidence for CPD remains a controversial topic in literature. Filges et al. (2019) found little evidence for the effectiveness of CPD. However, their systematic review included only 26 experimental studies on language and literacy as well as social and emotional development, particular features which made CPD less effective were also not explored. CPD has been recorded to improve knowledge but has not always produced a change in clinical habits (Johnson, Kraft and Papay, 2012). It has improved professional interaction especially among professionals working in isolated regions (Van et al., 2008). Effectiveness of CPD would depend on several factors such as intended target,

purpose of knowledge, techniques used, among others (WHO, 2013). Study reviews, interactive techniques, conferences, and didactic activities without practice were ineffective though widely used (Bloom, 2005), while a combination of techniques was found to be more effective (Forsetlund et al., 2009) as well as linking CPD to career progress (WHO, 2010).

CPD has been recognized and accepted as a priority area for the advancement of the profession (WHO, 2010), hence recommended for all countries (FIP, 2016). The individual pharmacist identifies learning gaps, makes plans to meet the needs, takes actions according to plans and evaluates success of the actions (Driesen et al., 2007). These steps are then recorded in a CPD portfolio. In contrast, the CE approach involved traditional teaching methods and was designed to address the learning needs of a majority of practitioners rather than being individual. This has been replaced by CPD in many countries (Bader et al., 2019). The main benefit of CPD is to provide practitioners with a systemised way to learn and to develop individual competencies as well as to assist with practice and health system gaps (Wheeler and Chisholm-Burns, 2018).

The Pharmacists Council of Nigeria established Mandatory Continuing Professional Development (MCPD) in 1998. It is a 3-year cycle developed into three modules in which every pharmacist must obtain 30 credit units. This system is named CPD, adopts the philosophy of CPD, but continues to use typical CE elements such as lectures, workshops and assessments. This is probably due to the resource and time intensity of the CPD approach (Driesen et al., 2007). There are also arguments in literature as to whether CPD should be mandatory (Ryan and Deci, 2002; Gagne and Deci, 2005), an argument for mandatory CPD has been that the moral sense of responsibility to maintain competence does not always sufficiently motivate pharmacists to undertake CPD. Suggestions were made to maximize pharmacists' freedom and autonomy even in mandatory settings in order to sustain motivation (Ryan and Deci, 2002). CPD in Nigeria is mostly an update process for continued knowledge-based learning (Ekpenyong et al., 2018) rather than a competency development method or a means for recertification (Bader et al., 2019), hence it was not extensively discussed during the interviews, but other practice support structures were.

Lifelong learning is a global core competency for pharmacy practice, so it was important to determine the degree of support for CPD that was available. 57.6% of pharmacists either agreed or strongly agree that they felt supported and encouraged to continually update their knowledge and skills to provide the best healthcare services while 26.4% disagreed or strongly disagreed.

A few other pharmacist support measures to enhance business and practice development were also discussed including stock management.

"It is an aggregation of community pharmacists we understand and we have seen that there is a gap between the professionalism aspect of community practice and the businessman that he is.. now, we have highlighted a value chain form procurement to after sales there are about 8 points…. the reason why is that people tend to overstock than what you actually need so we have come with a model, buy small small, buy what you need" (SWFG participant in pharmacy consultancy).

There was also support for industrial capacity building through a public-private type partnership between the United States Pharmacopoiea (USP) and the universities to train pharmacists on the pharmaceutical quality system; all steps towards ensuring that medicines are of high quality. This training was previously done on a small scale for pharmacists in practice but was being incorporated into the pre-service curriculum for better efficiency.

"We've been supporting the industry and each time we went there , we saw that this is not sustainable we cannot be training everybody every time, we do a lot of training, capacity building, hand holding so this is not how to change a country, we need something more revolutionary, and the only way is to use the universities…"(Manager USP).

Lifelong learning through CPD is critical to maintaining competence throughout one's career; hence it needs to be undertaken in a sustainable manner. There is no single correct approach to lifelong learning, and systems chosen should consider country peculiarities as well as existent constraints (Driesen et al., 2007). Any transfer of ideas or methods should first be adapted to local circumstances and be proven to produce desired behaviour changes in pharmacists who adopt them. CPD is fundamental to safeguarding patient welfare, improving healthcare service delivery as well as improving pharmacists' work satisfaction and retention (McCarthy et al., 2017), hence, should be prioritized. According to stakeholders in this study, pharmacists receive sufficient support for professional development.

4.4 Discussion

Pharmacists' identity, recognition, and motivation as well as an enabling environment largely determined how effective they would be at achieving professional goals (Hirschi, 2012). This chapter has also shown that while academic capacity may not meet expected standards, the practice

environment especially as regards government policies and systems in Nigeria may also be prohibitive to pharmacy workforce development and may be a major reason for poor academic capacity as stated by (Awaisu et al., 2018).

A major issue identified was the pharmacists' professional identity crisis caused by role ambiguity (Cavaco et al., 2005) made worse by unmet expectations (Mak et al., 2013; Noble et al., 2014; Abdu-Aguye et al.,2019). It is true that the broad training that pharmacists receive at university prepares them well to become involved in a wide and diverse spectrum of work and enables them to succeed at them all (John, 2018). Hence, it has been said that defining the role of the pharmacist should be avoided at all cost no matter how much there is temptation to do so because of its potential to result in a narrow, inaccurate, and incomplete definition that would preclude pharmacists that work outside of the traditional roles. It should however be noted that this benefit has the associated risk of the pharmacy profession losing its way, or worse, its identity while avoiding role definition and trying to take on new roles.

Poorly defined professional role boundaries can also become a source of conflict with doctors as has been discussed above (Tahaineh et al., 2009; Islam et al., 2014; Lalonde et al., 2011; Ables and Baughman, 2002; Matowe et al., 2006; Bryant et al., 2009). There is a risk that the best interests of patients and the public are not served as a result of this. Agreeing a statement on the role(s) of the pharmacist is difficult, but achieving a balancing act is necessary. Defining the fundamental pharmacist qualities creates an anchor for the profession and changing patient and service needs will describe how these qualities are applied over time. Other fundamentals also need to be agreed and patients, the public, and other professionals made aware of the depth and breadth of pharmacists' training as well as the skills they can expect from them by enacting clear and implementable policies. This policy clarity is necessary for managing students' expectations, informing societal perceptions of the pharmacists' roles and capabilities, enabling the government to institute appropriate systems to help broaden their scope of activities in response to the evolving healthcare environment. This would ultimately consolidate the pharmacists' identity. It may also help in making decisions concerning the nature of authority and responsibility between interprofessional relationships in healthcare, as well as what the formal and informal expectations of one another are.

Stakeholders discussed specific prohibitive policies to pharmacy workforce development thereby re-emphasizing the importance of favourable government policies (Okoroma, 2006). Weak and non-existent policies were also mentioned as was a failure to implement already enacted ones as described by Oseni (2019). This had led to a chaotic distribution system (Awaisu, Mohammed and Yakubu, 2016) that currently drives a national crisis:

the proliferation of fake and substandard medicines and made room for charlatans and quacks in practice. Stakeholders were convinced that this was one of the reasons for the widely varying societal perception of the profession, when the public often could not differentiate between pharmacists and quacks. Implementation of evidence-based policies is the vehicle on which functional societies ride (Nelson, 1993; Stern et al., 2000), without which the healthcare sector and indeed any sector cannot improve. Until priority is placed on enacting and implementing suitable and feasible policies there may not be meaningful improvement within the pharmacy sector.

Considering the health status of the country, and the wide acknowledgment of pharmacies being the first port of call for healthcare services in the LMIC context (AlGhurair et al.,2012), the deliberate or conspiring underutilization of pharmacists should not be an issue, if there is a sincere desire to make meaningful progress. The global trend is towards community and primary care service provision which was further emphasized by the Astana declaration on primary care (WHO, 2018). All efforts should therefore be made to continually improve and utilize the pharmacists' expertise in meeting patients' healthcare needs towards national health status improvement.

Considering the limitations of education as well as the rapid proliferation of knowledge, a system that works for continuing professional development, involving the circle of reflection, planning, action and evaluation, should be agreed upon and implemented at a national level. Given the diversity of approaches and pedagogical techniques that can be undertaken for CPD, it may be difficult to standardize. It can however be made mandatory or tied to career progression to ensure compliance especially in societies that struggle with this.

4.5 Conclusion

This chapter shows that fit-for-purpose workforce development depends on an enabling practice environment. This means fulfilled practice expectations, role specificity and definition to promote a healthy sense of identity, good professional governance which would eradicate charlatans and sanitize the drug distribution system and thereby establish coherent societal perceptions of the pharmacist. Constantly improving and enabling the utilization of the full range of pharmacist skills in patient care, interprofessional cohesion and collaborative practice, adaptive and favourable government policies that facilitate needs-based pharmacy education and practice, as well as appropriate supports for professional development were also discussed. All of these determine professional relevance of the Nigerian pharmacist.

Summarily, it was evident from this chapter that an enabling pharmacy practice environment in Nigeria could be achieved. Misappropriation of resources due to corruption, poor regulation, ineffective and weak policies as

well as a lack of political will to implement existing policies have led to the state described above. These challenges have all been highlighted by other studies carried out in LMICs. (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008; Babar et al., 2013), and need to be appropriately addressed in order to achieve fit-for purpose pharmacy workforce development.

5 Chapter 5: Systems Efficiency

5.1 Introduction

Given the education capacity challenges and realities of the practice environment discussed in previous chapters, there was a consensus among those interviewed and surveyed to upgrade pharmacists' training by an improved pharmacy programme which will meet societal healthcare needs and at the same time address issues raised. "The PharmD switch" was the most commonly proposed solution, just as it has been the model for upgrade employed by many countries (Kapool et al., 2008), and it was in the early implementation phase in some pharmacy schools. The "PharmD switch", is discussed extensively in this chapter, having generated both local and international debates as to its suitability and feasibility in the LMIC context (Jamshed, Babar and Masood, 2007; Anderson and Futter, 2009). This chapter aims to ascertain the efficiency of the PharmD switch given current education and practice conditions. Efficiency is defined as the extent to which workforce goals and outcomes can be maximized given available resources and already existent conditions. Figure 5.1 illustrates the chapter structure while table 5.1 shows the frequency distribution for system efficiency variables.

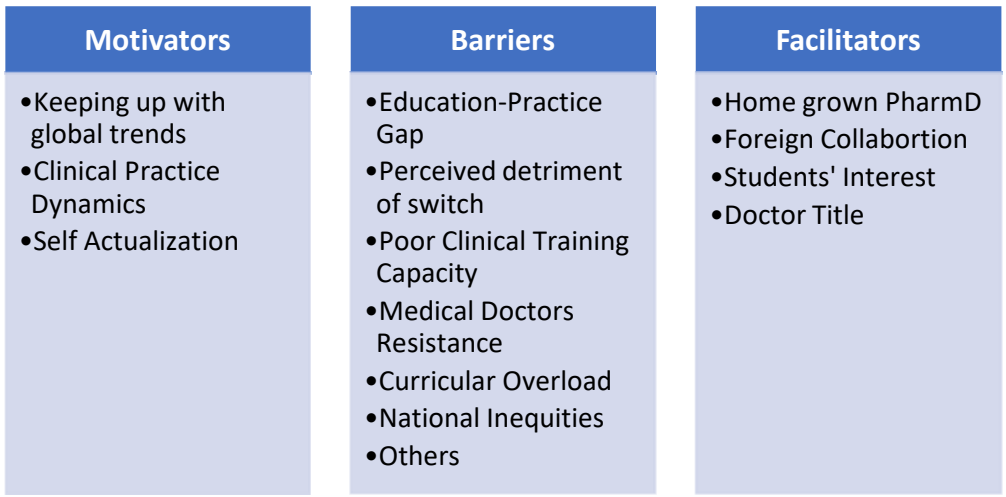

Figure 5.1: Chapter structure

Table 5.1: Frequency table for systems efficiency variables

Key for tables below: SA- Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree, N-Count.

S/N	Variable		SA	A	N	D	SD
1.	A clinically intensive, patient focused curriculum can be achieved with the current Bachelor of Pharmacy Programme.	N	146	285	138	500	195
		N %	11.6	22.5	10.9	39.6	15.4
2.	A two-track undergraduate pharmacy programme training either pharmacists or pharmaceutical scientists is preferable to a single programme training both.	N	190	312	314	261	179
		N %	15.1	24.8	25.0	20.8	14.3
3.	The pharmacy programme should be allowed to run an independent school calendar (like medicine does) to effectively cover the course load of the undergraduate degree.	N	856	318	60	21	8
		N %	67.8	25.2	4.8	1.7	0.6
4.	A teaching system in which topics are integrated and taught in themes without regard for departmental boundaries would be better for students' understanding than departmental teaching.	N	377	345	245	218	75
		N %	29.9	27.4	19.4	17.3	6.0
5.	High work pressure, due to heavy workload, made worse by workforce shortage has negatively impacted pharmacy educators' academic productivity.	N	547	504	124	69	15
		N %	43.4	40.0	9.8	5.5	1.2
6.	Interprofessional education and systems involving various health care professions in collaborative partnerships will achieve better health outcomes.	N	813	397	38	9	8
		N %	64.3	31.4	3.0	0.7	0.6

7.	A strong partnership between pharmacy schools and the public/private sector is foundational for the achievement of a needs-based pharmacy programme.	N	722	444	71	19	6
		N %	57.2	35.2	5.6	1.5	0.5
8.	Nigerian pharmacy education fosters national equity through processes such as admission diversity and staff recruitment.	N	122	366	410	254	103
		N %	9.7	29.2	32.7	20.2	8.2
9.	Female pharmacists are not given the same professional opportunities after graduation as their male counterparts.	N	59	63	200	457	482
		N %	4.7	5.0	15.9	36.2	38.2
10.	An age diverse education leadership will make better decisions than a gerontocratic one.	N	292	389	459	76	31
		N %	23.4	31.2	36.8	6.1	2.5
11.	The geographical maldistribution of pharmacists can be addressed by providing incentives to students who school in rural or semi-rural areas to practise in same areas after graduation.	N	531	498	131	75	25
		N %	42.1	39.5	10.4	6.0	2.0
12.	Insecurity, due to tribalism, ethnic and religious violence in certain geopolitical regions, has increased apprehension to schooling in those areas.	N	747	371	79	36	27
		N %	59.3	29.4	6.3	2.9	2.1

5.2 Motivators for the PharmD switch

It was clear from interview responses that a majority of education stakeholders thought that pharmacy education had been responding accordingly to changes in practice. The change from the diploma to the four and then five-year Bachelor programme (Ogaji and Ojabo, 2014) were indicative of this. The PharmD switch, in their opinion, was just one more of such responses which was timely and necessary given the paradigm shift in practice from product orientation to a focus on the patient (Babar et al., 2013; Anderson et al., 2010; Breland, 2007).

"As you know, traditionally, pharmacists were apothecary at the beginning, dispensing and prescribing, combining them……all medicines were extemporaneous preparations in those days, and it kept pharmacists very busy, but they now come from the company readymade, so pharmacy needs to increase their clinical involvement to foster rational drug therapy..things are evolving (Dean SS University).

Stakeholder responses indicated that the BPharm programme as it exists could not provide graduates with requisite skills for patient focused practice being a scientific rather than clinical programme (Babar, 2005; Ghilzai, 2008; Ghilzai, 2009; Mangasuli et al., 2008; Ikhile and Chijioke-Nwauche, 2016; Mendonça, Freitas and Ramalho de Oliveira, 2017). A higher percentage (55%) of respondents disagreed or strongly disagreed that a clinically intensive patient focused curriculum could be achieved with the current Bachelor of Pharmacy. A median rank of 4 indicated a tendency for stakeholders to disagree to this statement.

The final approval of the Nigerian PharmD was celebrated among pharmacists, especially those in academia and regulatory practice following a tortuous 16-year approval journey fraught with political complications. Keen to understand why education leadership persisted in seeking approval for the programme change despite seemingly daunting challenges, participants said the most commonly described motivator for the switch was a desire to keep up with global trends such as patient- focused practice (WHO, 2007) and collaborative practice (IOM, 2010; WHO, 2010). This was largely informed by an evidence-base for improved health outcomes (Martinez et al., 2017; WHO, 2010) when all relevant health professionals are involved in patient care and corroborated demand for clinical services increases in many LMICs (Alemayehu et al., 2013). The ultimate goal was to maximize the capacity of available health workforce to provide pharmaceutical care, by working collaboratively and in synergy towards the attainment of global health goals.

Following the paradigm shift to patient-focused practice, there has been a consensus that clinical pharmacy should evolve from specific patient-related functions to a culture where all actions are intentionally undertaken to achieve the best patient outcomes (Hepler and Strand, 1990). This was the premise on which the concept of pharmaceutical care was built, and it has been embraced by several countries (Pang and Wu, 2008). The current scientific BPharm did not adequately prepare pharmacists for the clinical-based roles (Hassali et al., 2011; Ghilzai, 2008) hence change was required.

Stakeholders were aware of the importance of accepting change by revising the BPharm to reflect best practice and maintain global relevance. This ties into the global comparability theme discussed in chapter 3 and has been described as a priority focus for LMICs in literature (Babar et al., 2013; Jamshed et al., 2007; Duweijua et al., 2004; Asiri, 2010).

"But however, we as pharmacists we do believe, and we do understand also the dynamics of life and any profession that actually is not dynamic and does not change with time is gradually going to die off (Dean NW University)

Some other participants agreed that professional flexibility was important but stressed that this must be closely linked to societal relevance and must be pursued considering national priorities and country specific peculiarities and challenges in line with global standards (FIP, 2013). Change should be undertaken in response to an identified need and the most efficient choice should be considered. Some reference countries for Nigerian pharmacy workforce development such as the US and Canada had made change to their pharmacy programme, and based on stakeholders' reports and backed by literature, were now getting better services for their patients due to improved clinical knowledge. Piascik, Butler and LeGrand (1992), Fjortoft and Engle (1995), Fjortoft, Weigand and Lee (1999) all showed improvement in practice, higher level of job satisfaction and greater scope of clinical responsibilities among PharmD graduates in the USA. But when stakeholders referred to these reference countries, context differences were not considered (Salamzadeh, 2004) and these differences may determine the suitability and feasibility of the switch (Babar et al., 2013) especially when compared to the lack of recognition for the pharmacists' clinical role in many LMICs (Mangasuli, Rajan, and Khan, 2008; Jamshed et al., 2007; Ahmed and Hassali, 2008).

"I am not saying that it cannot work here in Nigeria but inasmuch as we don't want to be in isolation of what is happening outside, we cannot also be insensitive to our peculiar problems" (SSFG Community Pharmacist)

This may have been the thoughts of a few participants who described the programme change as unnecessary and purely motivated by a desire to be like the 'others' not considering if it will meet societal healthcare needs. And that this was another effort to attain 'global comparability' motivated by a fear of being left behind without considering peculiar circumstances in the countries that have made such changes as discussed in chapter 3. Mmuo (2013), Okonta, Okonta, and Ofoegbu (2012) as well as Okoro and Ibrahim (2012) revealed several issues such as poor ICT knowledge and skills, poor remuneration and unwillingness to collaborate as barriers to pharmaceutical care, as well as a lack of motivation to drive its implementation rather than a gap in pharmacists' knowledge. A survey (Mmuo et al., 2014) revealed over 70% positive response to adequate pharmacists' knowledge of pharmaceutical care in Nigeria.

"…because if everybody is talking PharmD …. talking everything apart from what we need because we want to be like pharmacy in the US. Is there anything wrong with that….no, but does it meet our needs? In the US, pharmacists don't own the industries, but in Nigeria we own our industries, does the PharmD cater for that? T*he issue is that we allow pressure to*

modulate. Sometimes I wonder, are we really training these students for Nigeria or for UK or for the world? Because we know that there are some things that if it is not in our degree will not make it acceptable outside. So, I am not very sure who that curriculum is for..." (SWFG Academic Pharmacist)

Other important factors such as ensuring that the switch is value-adding and ensuring that curricular delivery and appropriate pedagogies are prioritized were also mentioned. Some participants were convinced that the present BPharm curriculum could do more and did not need to be changed if appropriate pedagogies were applied. These were not the majority as evident from quantitative responses reported above, it was clear that stakeholders were not in agreement about the need for the PharmD switch. Some wondered why the clinical content of the BPharm could not be upgraded if that was the sole reason for the switch, this raised questions about the possibility of hidden motives behind the switch. A few others suggested that both programmes should run concurrently so that students are provided with a choice, and those who have no interest in clinical pharmacy would not have to spend a whole year preparing for it.

I said this profession should be split into two clinical pharmacy and industrial pharmacy, you choose one, that was my suggestion then, because you find out that if a medical student graduates and wants to be a gynaecologist he knows where to go, but as a pharmacist you will graduate you won't even know what to do, where to go, you are confused (SSFG Hospital Pharmacist)

Some participants did not agree with this and thought that given the resource constraints of the country running two pharmacy programmes concurrently may neither be feasible nor sustainable. Yet other participants thought that it was important to have a single programme with a broad curriculum so students can be prepared for various sectors of practice which provides flexibility and increased employability considering the high unemployment rate. The broad curriculum also ensured that students would not be forced into one area of practice simply because that is the only area emphasized by the curriculum. Specialization, they thought, should be reserved for postgraduate education.

"….you know when you are into a program you have so many students who will end up in different areas of practice it is premature maybe to be so selective, this one is not necessary this one is, it depends on how the importance is brought down to the recipients or students so I think what we have in our curriculum today we have a very broad area and then when you are into your area of practice you can now narrow down, you don't stop reading after graduation" (Dean SE University)

Consensus was not achieved in the survey, a median rank of 3indicated a tendency towards the neutral response to the statement that a two-track

undergraduate programme training either pharmacists or pharmaceutical scientists is preferable to a single programme training both.

5.2.1 Keeping up with Global Trends

Efficient health systems are making the transition to team-based healthcare and collaborative practice. Since no single profession can deliver the full range of services needed, quality patient care depends on a wide range of professionals working together. Stakeholders reported that global trends around a patient-focused, collaborative practice was the major motivator for the switch. Collaborative practice in healthcare occurs when healthcare professionals from different specialties provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across all settings (Reeves et al., 2015).

The complexity of diseases, increasing sophistication of therapies and accompanying technologies, as well as workforce shortages support the need for collaborative practice (Reeves et al., 2013). The benefits of collaborative practice in clinical settings are reported by several studies (Mickan, 2005; Greiner and Knebel, 2003; Frenk et al, 2010), including reduced hospitalisation time and costs (Green and Johnson, 2015), reduced unanticipated admissions (Makowsky et al., 2009), better accessibility, improved coordination of care, enhanced satisfaction, improved acceptance of treatment for patients. Team benefits include efficient use of healthcare services (WHO, 2010), reduced errors (Morey et al., 2002), enhanced communication and professional diversity (Helitzer et al., 2011), enhanced job satisfaction, greater role clarity and enhanced well-being (Taylor et al., 2007).

These benefits were acknowledged in this study, as well as the essential role the pharmacist plays in providing best quality patient care when medicines are part of a prevention or treatment plan (FIP, 2009).

"A lot of studies have shown that having the pharmacist as a critical member of the team has reduced economically the expenses used for drugs and has also improved the quality of life of the patient. And when we see this without being professionally selfish. If we take the patient as really the most important, we work together for the good of the patient and help the country economically, and be happy as a team" (Dean SW University)

Benefits of interprofessional education as preparation for collaborative practice are documented (see figure 5.2). A review of literature on studies conducted in eight HICs demonstrated that after exposure to interprofessional teaching, students from different health professions improved their knowledge and appreciated roles of other professions (Ateah et al., 2011; Dumont et al., 2010; Nango and Tanaka, 2010; Cameron et al., 2009; Almas and Barr, 2008; Hamilton et al., 2008), improved clinical and practice based skills (Coster et al., 2008), communication and team working

skills (Dumont et al., 2010; Hamilton et al., 2008), improved confidence in one' s professional identity (Terry, 2009), breaking down communication barriers and knowledge sharing (WHO, 2010; Barwell, Arnold and Berry, 2013), and an appreciation of community health problems (Pollard et al., 2006) after interprofessional practice sessions. Longitudinal studies showed an increase in knowledge gained (Furber et al., 2004), and enthusiasm for studies remained high (Steward et al., 2010). Buring et al. (2009) stated through interprofessional educational education, students learn how to function effectively in a team and this competency translates to collaborative practice in the future. There is another school of thought that effective collaborative practice cannot be taught but can only be learnt or become relevant through practice (Jakobsen et al., 2011). Hence for interprofessional education to be effective practice sessions for students should be incorporated.

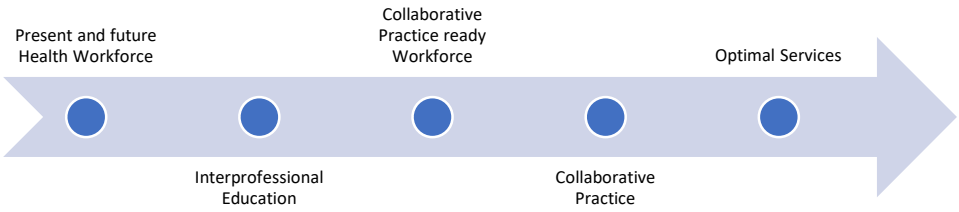

Figure 5.2: How interprofessional Education leads to provision of optimal services. Adapted from Framework for Action on Interprofessional Education and Collaborative Practice (WHO, 2010)

This global trend towards collaborative practice facilitated by interprofessional education was another major motivator for the PharmD switch according to stakeholders. They believed that with both pharmacy students and pharmacists receiving training and performing clinical roles in the hospitals respectively, there is a greater chance for them to work with other healthcare professionals from various disciplines and contribute distinct professional knowledge and health services to the ultimate benefit of the patient. Following a recent health workers' strike that had caused a major rift between the doctors and pharmacists in a frequently occurring pattern, participants stressed the importance of teamwork in healthcare, and the benefit to patients when this is achieved. As the PharmD is focused on direct patient care in collaboration with other health professionals, they had high hopes that this would foster professional cohesion and stave off ongoing strife, hence lead to the achievement of best health outcomes for patients.

"Another thing is that globally it is the trend now, in the hospitals the doctors need pharmacists when they are going for ward rounds so that they would give objective very positive contribution to patient therapy and they can monitor the patient even after they are discharged for follow up and so on, so it is really needed" (Dean NE University)

The quest for the PharmD switch in Nigeria, according to regulatory leadership, initially began as a desire to comply with global recommendations around a collaborative patient focused practice, but had to be justified by evidence for improved patient outcomes when pharmacists were involved in clinical practice or therapeutic management of patients, to ensure the decision is evidence-based for the programme to be approved. An interview with the director of an accrediting body revealed that this was the sole reason the switch was approved. He said the agency was committed to continuous development and the progress of every profession and ensured support was provided for new initiatives and revolutionary educational ideas. The PharmD was said to be a programme designed to *"optimize the benefit of medicines to patients"* through collaborative practice with every health professional making a meaningful contribution to the team.

"Everyone must work together; each one has its own objectives and functions and must work together as a team. When we see this without being professionally selfish…the patient is really the most important. We work together for the good of the patient and help the country economically, and be happy as a team (Dean SW University)

This opinion was credited by a near consensus in the quantitative phase as the majority (95.7%) of respondents agreed or strongly agreed that interprofessional education and collaborative partnerships would achieve better health outcomes.

The benefits of interprofessional education and collaborative practice are undeniable. These are in line with global standards for education and practice (WHO, 2010; IOM, 2010; FIP, 2015), but the question remains if a change in programme is necessary to incorporate interprofessional education towards collaborative practice.

5.2.2 Demand for Clinical Services

Clinical pharmacy has since been the main vehicle for the paradigm shift in pharmacy practice in many HICs (Stephen, 2003; Hassali et al., 2011). Changes in practice have involved role extension through increased clinical services within the hospital sector. The clinical focused practice has also been embraced by many LMICs in hospital and community practice settings and has been reported in this study as a major reason for the switch to a more clinical pharmacy programme to better prepare pharmacists for their increasing clinical roles.

According to stakeholders, the PharmD was a direct response to the initially perceived, and then subsequently confirmed clinical needs of the Nigerian society. This view was nationally perceived and was the most frequent response to the survey question seeking to understand the reason for the proposed switch (see table 5.2). 47.7% stated that the proposed switch was mainly because of pharmacists' increasing clinical role in the country.

Table 5.2: Count for PharmD switch motivation variable

Rank Value	Option	Count	Descriptive Statistics
1	The doctor title	34	Mode 4
2	A need to contribute meningfully to the helath team	308	
3	A need to align with global practices	307	
4	Pharmacists increasing clinical role in the country	592	
	Total (N)	1241	

A director in the regulatory agency stated that the PharmD programme was approved following a needs analysis and careful consideration of the societal clinical demands on pharmacists and has been tailored to meet specific healthcare needs of the country.

Pharmacies, as the first port of call for healthcare services, are central to health service provision in many LMICs (AlGhurair et al., 2012; Smith, 2009). Being conveniently located in residential areas, with a readily accessible pharmacist who often charges no consultation fees. Patients only go to the hospital when they feel their medical case is severe or in case of an emergency. Stakeholders reported that the need to provide these services highlighted gaps in the pharmacist's clinical knowledge in contrast to earlier discussed survey (Mmuo et al., 2014), and the PharmD was proposed on this account. Considering the already large yet growing population, shortage of medical workforce, and inaccessibility of health services, pharmacists thought they could make a meaningful contribution towards primary care provision in this way.

"The PharmD program is needs based, if you have been here and seen the trends in Nigeria, people go to the hospitals as a last resort, now with the level of enlightenment taking place in the country, the pharmacy is the first port of call for every ailment, it is when it needs a surgeon's knife or needs some specialty that they now go to the hospitals, the need of the average Nigerian is to get well not to go and queue and pay so much money before you get attended to. The PharmD is training people who will attend to Nigerians based on their needs. So, I think it is a very good and welcome program" (Dean SS University).

However, these efforts to upgrade clinical education by making the switch to the PharmD which many LMICs have now embraced (Summers et al., 2001; Okumu, Ochola and Onyango, 2013; Jamshed and Babar, 2009; Ahmed and Hassali, 2008) have been criticized within published studies. According to Jamshed et al. (2007), since clinical pharmacy is almost non-existent in current practice in many LMICs, it is difficult to justify the additional cost, greater resources, and longer study duration associated with clinical education which is the focus of the PharmD. While this argument may sound logical in the short term, it is widely known that the need for clinical pharmacy practice exists in the LMIC context where disease burden (Dayrit and Dolea, 2006), and health workforce shortages are highest (FIP, 2009).

A few stakeholders thought that clinical pharmacy practice was not developed in Nigeria hence PharmD graduates may struggle to fit in or find jobs afterwards. It was interesting to find out that a few participants thought the remedy to the underdeveloped clinical/hospital pharmacy practice was yet more/better in-school training of pharmacists rather than a focus on practice issues. Having stated that pharmacy graduates felt they were not utilizing their school-acquired skills in the practice, a few participants thought they still needed to improve these skills in school. Having increased the clinical curricular content of the BPharm pharmacy in previous years, students reported that they felt more confident but were not give the opportunity to practice clinically. Here practice environment challenges arise again. Stakeholders stated that it was not efficient to train pharmacists who would not be able to maximize the benefits of clinical training received in subsequent practice.

"….like you rightly mentioned now the PharmD is more clinically oriented than the other one, actually, the thing is the BPharm also we injected clinical aspect just to differentiate it but the thing is actually we did not see much change in the clinics, the students probably never get an opportunity to practice, even though they do well in practicals but you find that in the hospitals clinical practice is still very skeletal, not the clinical practice that you expect" (Dean NW University)

After all said, pharmacists are still the most accessible healthcare professionals globally (Tsuyuki et al., 2018; Anderson et al., 2009), and can therefore play a crucial role in providing direct patient care (Niquille et al., 2010; Peterson and Kelly, 2004). Hence, efforts should be made to further enhance this role with a broader scope of practice by strengthening clinical practice on all fronts and in all ways possible, including improving clinical education in a sustainable manner, identifying and working to overcome barriers to clinical practice and not backpedalling in response to its perceived absence.

5.2.2.1 High Ratio of Pharmacists in Clinical Settings

In addition to increasing public demand, statistics show that the highest number of pharmacists are in clinical settings, either in community practice or hospitals (Ekpenyong et al., 2018). This, they explained, was due to the level of development of the country hence a lack of expertise for research and development (Fathelrahman et al., 2016), and too few industries manufacturing medicines (Awaisu, Mohammed and Yakubu, 2016). With poor remuneration in academia, lack of research grants and poor infrastructure (Duze, 2010), most pharmacists were likely to choose hospital or community practice.

"when you now do the statistics of the graduates of pharmacy where are they mostly distributed, where are they needed most, you see that a majority of pharmacy graduates go into community and hospital service and therefore they need a significant knowledge, a significant clinical knowledge of diseases, drugs, and outcome, so the PharmD curriculum actually increased the proportion of clinical content to about 30%, that is the design. The BPharm curriculum has very small component of clinical content, less than 10%, which is not adequate for the pharmacy graduates to meet the challenges of hospital practice and community practice where most of them end up" (Dean SS University)

Survey demographics also revealed this distribution of a majority in hospital (35.7%) and community practice (38.9%) (see figure 5.3 below).

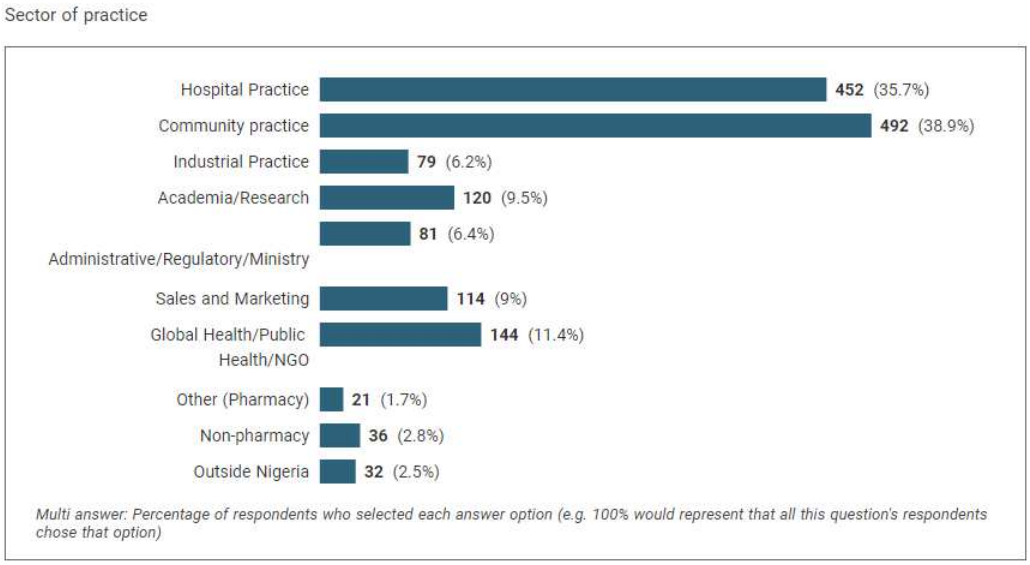

Figure 5.3: Survey respondents' sector of practice demographics

There is a need to harness this distribution for the provision of primary care. Appropriate training of pharmacists on diagnosis and treatment of minor ailments, first aid, and signposting is likely to improve health service provision in Nigeria and reduce the burden on medical doctors, since the strength of a

country's health system has been attributed to the strength of its primary care provision (Tsuyuki et al., 2018).

5.2.2.2 Clinical Workforce Shortages and Maldistribution

Health workforce shortages are a global crisis that may have no immediate solution. These well-documented shortages (Bates et al., 2016; WHO and GHWA, 2013) are worse felt in some countries, such as Nigeria, across all levels of health provision, worse in rural areas (Abimbola et al., 2017; Kombe et al., 2009; WHO, 2006) and primary care facilities (Ekpenyong et al., 2018). In Nigeria only about 20% of physicians, 30% of nurses, and 38% of the pharmaceutical workforce work within primary care (Chankova et al., 2006). Stakeholders discussed the shortage and felt it was partly due to the brain drain (Matowe et al, 2003; Levy, 2002) where pharmacists had travelled to other countries seeking better conditions of employment. Geographical maldistribution was attributed to poor living conditions in rural areas, so health professionals generally preferred to work in cities. Many participants in both quantitative and qualitative phases reported that the current BPharm did not prepare pharmacists for rural practice effectively (see table 5.3), they hoped the PharmD would train pharmacists who are able to meet these needs adequately.

"We have many hospitals in Nigeria that don't have a single pharmacist, and then there are many communities in Nigeria where they have only one pharmacist serving the whole community and some communities that don't even have pharmacists at all so the demand for pharmacists in community and hospitals is still very high, so that is why if that is where the demand is highest then we need to increase the curriculum content of their clinical knowledge so that they will be more equipped to meet with the demand that the environment poses on them, though that's actually another reason why the PharmD curriculum was created" (Dean SS University)

33.5% of survey respondent thought the BPharm prepared them to a small extent or not at all with rural health and community practice competencies, and only 13.4% thought they were prepared to a great extent. A median rank of 3 indicated that stakeholders felt prepared to a moderate extent.

Table 5.3: Descriptive statistics for rural health and community practice variable

Rank Value	*Option*	*Count*	*Descriptive Statistics*
1	To a very great extent	169	Median Rank 3
2	To a great extent	287	Lower Quartile 2
3	To a moderate extent	382	Upper Quartile 4
4	To a small extent	294	
5	Not at all	129	
	Total (N)	1261	

Rural practice was one of the areas the PharmD was said to focus on with the hope that pharmacists with better competencies may be motivated to practice in these areas, thereby addressing the maldistribution. While workforce shortages are a global problem, there is an urgency to focus on areas of greatest need which expectedly are also areas with poorer health status. In light of the maldistribution, there is a need for the training of health workers and the curriculum to do more in preparing graduates for rural practice. Policies are also needed to encourage retention and redistribution of pharmacists whether or not the switch is implemented. This may be the only way to optimise health services in the meantime.

5.2.3 Self- Actualization

Self-actualization in this study referred to the realization or fulfilment of one's potential. It was closely linked to both pharmacists' self-perception, and the perceptions of other health professionals and the public. Pharmacists felt undervalued; relegated in hospitals and underutilized in the clinical space as discussed previously. This negatively influenced job satisfaction (Celik and Hisar, 2012) and work engagement (Bothma and Roodt, 2012). Pharmacists were often referred to as "those that give out drugs" despite being trained for so much more. Pharmacists especially in hospital had complained passionately about the non-existent clinical roles (Ahmed and Hassali, 2008; Jamshed et al., 2007; Mangasuli et al., 2008). They were often confined to the dispensaries, and all they did on a day to day basis was dispense medicines and counsel patients (when a counselling room was available) as briefly discussed in chapter 4. Stakeholders believed that the PharmD would provide a platform and 'license' for pharmacists to go beyond dispensing into the wards to monitor therapeutic and side effects of medicines, monitor adherence and promote the rational use of drugs to improve patient health outcomes.

"What is driving the change is the fact that pharmacists are thoroughly trained and yet inadequately utilized. So, it's like wasting resources! That is what I say about the systemic circumstance in which pharmacists practice in the hospital. So, the thing is by improving the clinical experience, increasing the number of years of training, improving the level of exposure to the clinical environment such as hospital, that which is required in order for the pharmacist to really make an impact on the life of the patient and on the hospital system and other areas will actually improve"(Dean SE University)

Some participants thought the PharmD may improve pharmacy's professional profile, give them a firm footing in patient care, and improve visibility to other healthcare professionals while working in collaboration with them. The doctor title may enable the public to differentiate them from non-professionals. A

few academic pharmacists who had post graduate degrees in clinical pharmacy reported that they were still not considered clinical pharmacists on a global scale and would require a PharmD to practice clinically. This was despite claims to their higher levels of clinical knowledge than the PharmD holders. Babar et al., (2013) reported that the term 'clinical pharmacy' is understood differently across the globe. Despite the PharmD switch there is evidence that the philosophy underpinning clinical practice is poorly understood in some LMICs (Babar, 2007).

"Now I have my masters in clinical pharmacy and my PhD even though my research was in pharmacoeconomics, but across the globe people don't want to believe you have clinical pharmacy knowledge except you have PharmD, the pharmacotherapy in my head now is more than what some people have across the globe I am very sure of that but without that PharmD nomenclature, they won't believe this" (Dean SS University)

It was an added advantage that the PharmD graduates were called 'doctor' while they were not medical doctors. Due to the high level of illiteracy in the country, patients would rather have someone labelled 'doctor' attend to them than someone without the title.

The concepts of professional recognition and self-actualization are in themselves complex concepts. Professional recognition being a fluid term may also not be easy to clearly define or actualize by a programme change.

5.3 Barriers to Implementation

According to Ukeje (1986) implementation is perhaps the most important phase of planning, yet it is a huge problem that has taken centre stage in Nigeria (Okoroma, 2006) and hindered national development. The gap between programme or policy development and attainment of set goals due to poor implementation has become a matter of great concern and has been attributed to a lack of political will, poor continuity, and corruption. Previous studies to assess the efficacy of education policy implementation (Okoroma, 2003) reported inadequate number of qualified teachers, poor funding, poor infrastructure, lack of teacher motivation. Other documented factors include over-estimation of available resources, underestimation of costs, over reliance upon external assistance, inaccurate statistical data (Adesina, 1977), poor communication, poor capacity and dispositional conflicts (Van Horn and Van Meter, 1977).

Stakeholders were not blind to potential implementation challenges as well as existent barriers to successful implementation of the PharmD and these were discussed extensively. As discussions progressed it became obvious that the PharmD, while addressing some challenges, would likely create several others of its own. Existent challenges with the BPharm such as curricular overload

and poor access to experiential training sites were also likely to be magnified by the PharmD being a credit heavier and hospital-based training programme.

5.3.1 Education-Practice Gap

The discrepancy between education and practice sectors and resulting theory practice gap highlighted in chapter 3 has been reported by several studies over may years (Lee and Sim, 2019; Leducq et al., 2012; Larsen et al. 2002, Molassiotis and Gibson 2003; Gallagher 2004; Higginson 2004; Stevenson 2005). It is a major reason for skill mix imbalance which has become a global phenomenon and a challenge to most health professions (Duchscher, 2009) as earlier stated.

Considering that the proposed PharmD programme was a practice-based one with a full year of clinical rotations, participants were concerned that this gap may serve as a daunting barrier to the smooth integration of theory and practice required for its success. They understood that a strong partnership between these sectors is the backbone required for quality Pharm D implementation. Others discussed historical collaborative partnerships between education and practice in Nigeria that were no longer so.

"…in the 70's and 80's we had a lot of multinational companies in Nigeria that would have their research and development laboratories in Nigeria but now it is almost non-existent, that also has affected the collaboration between the industry and academia because the academia should play a role in drug development within the industry, so that relationship is not what it ought to be although the National Association of Industrial Pharmacists are trying to establish a collaboration but it is not like what happens in other countries" (Dean SW University)

This gap, according to stakeholders was the main reason for the discrepancy between acquired and required skills in the profession. It was partly caused by government policies that prohibited educators from simultaneous active practice like the medical doctors do, in which case many educators were unable to build partnerships with pharmacists in practice and were often unaware about practice advances. Literature reports that this gap is the historical outcome of faculty moving away from direct service provision in practice to solely focus on teaching and research (Hodgman, 1991). Subsequent recommendations have been made for faculty to engage in practice as part of their professional development. An interview with a regulatory agency director revealed efforts to address the gap by encouraging schools to hire teacher practitioners until policies are reconsidered.

"it's something that we are aware of, and it's for that that we are encouraging the universities to involve the practitioners, involve them in the training. If they are part of it, they know what they need. But I must say for now the

universities are not fully co-operating because the policy on somebody being in the system does not really encourage that]" (Director, Accrediting Body)

For every practice-based course, integrating knowledge with practice is important to the subsequent provision of quality services (Bland, Topping, and Wood, 2011; Jho, 2014), and this cannot be effectively achieved without co-operative partnerships between education and practice which requires ongoing dialogue and contributory relationships. Effective partnerships should create new and different ways of working together to achieve common goals which are entrenched in shared education culture ensuring that programmes achieve expected results. Involving multiple institutions may be beneficial for diversity and increased opportunities (Stanley et al., 2002).

In many cases these partnerships are discussed but not executed (Gubbins et al., 2014), and the majority of published literature on academic-practice partnerships is anecdotal rather than empirical (Beal, 2012). Academic institutions have not collaborated with healthcare systems in practice (Haines et al., 2003; Bauman et al., 2012). Similar reports were made in this study to the extent that academic institutions were likened to cults, where membership and partnership were restricted, as described in chapter 3. However successful partnerships have occurred in the nursing field (Libster, 2011), and in a few pharmacy schools where these practitioners were offering voluntary services and not being paid.

"we're not paying them, and then we are trying to look for documents because we hear that there are some documents that talk about paying them some stipends but we are not able to lay our hands, but even then when you even lay it, you still have to go and be pleading with the VC, and the VC already is saying that even he is not able to pay his normal staff not to talk of now giving…. So, we try to appreciate them once in a while…. that we know you're supposed to be remunerated but for now we are not finding the source or the way to go about it" (Dean SW University)

Other schools reported that there was no structure for teacher practitioner career advancement. The teacher practitioner who had been with them for years had remained on the same salary scale while all other academics had been promoted. A few participants had themselves volunteered to be teacher practitioners and only asked that their travel costs be paid, one participant was willing to bear all costs, but they still were not contacted after the offer. These are issues that need to be resolved for teacher practitioners to be recruited and retained.

"I told the HOD of clinical pharmacy, you people if you can mobilize me I will come and teach these students free of charge, just give me transport fare or fuel my car, to fuel my car they said the paper is in the HOD's office, in the dean's office till today" (SSFG, Hospital Pharmacist)

While education-practice mismatch is a valid barrier to the successful implementation of the PharmD, it can be addressed by partnerships between the two sectors. Benefits of these partnerships include increased ability to leverage and maximize resources, cost-effective education and decreased costs in orientation and recruitment of faculty and new graduates, enhanced research productivity, new opportunities for development, and improved patient outcomes (Beal, 2012).

5.3.2 Perceived Detriment of Switch to Other Practice Areas

The pharmaceutical industry is very important to the development of Nigeria (Awaisu, Mohammed and Yakubu, 2016). In many LMICs, there are better employment opportunities within the industry with better remuneration (Ghilzai and Dutta, 2007; El-Awady et al., 2006). Considering that the PharmD switch has been regarded as a change from pharmaceutical science-focused pharmacy education to patient-focused pharmacy education (Ryan et al, 2008; El-Awady et al.,2006), stakeholders were concerned that after the switch, the coverage of non-clinical practice areas would be minimized in the curriculum which may lead to a lack of relevance of pharmacists to the industry, or gradually lead to the irrelevance of other departments in school.

"We should not also forget that Nigeria is a developing country, if we don't factor in the area of the industry in terms of production then we may run into problems eventually. Our curriculum should be robust enough to give adequate exposure in all the areas of pharmacy because if we narrow it down and we don't really adapt it to our situation in Nigeria we may lose out on some important parts that we really need in Nigeria" (Dean SW University).

In the planning stages, signs that the clinical pharmacy department would get increased credit load and increased relevance already led to political issues. One of the key proponents of the programme spoke about having to massage egos and make concessions to avoid a total collapse of the programme due to 'relevance' politics. Participants in the Northern geopolitical zones and those in industrial practice areas were most likely to express fears that the PharmD would lead to irrelevance of other sectors in initial interviews. Further interviews, however, revealed that these fears were unfounded, the proposed PharmD programme was not a purely clinical one but had taken all other sectors of pharmacy practice into consideration which apparently was the way to go considering the level of development of the country. It was referred to as a 'home grown PharmD'. Similar to the clinical-industrial hybrid type programme run in Pakistan (Jamshed, 2007).

"The PharmD we are introducing here…is a home grown PharmD. Back home here we can't afford to shift completely away from the pharmaceutical sciences because we still have the industries to cater for, we still have the research areas to cater for, because of that we just want to do something that is more of, something that will have the critical area of clinical practice

without losing the pharmaceutical science content of pharmacy education" (Education Director)

It is a global goal to ensure that pharmacy programs are developed keeping in view the current needs, future direction of the profession, as well as available human and financial resources. Hence, the change from an industrial based program to a fully clinical one will neither be suitable nor sustainable in LMICs, considering that industrial practice is still a major employer. Practically this change cannot occur all at once (Hadi and Hughes, 2009) , and the hybrid PharmD may provide a support system for a smooth transition from industry-focused practice to a patient centred one overtime (Ghilzai, 2008) in line with global recommendations.

Summarily, this was just a perceived barrier. This issue had been taken into consideration when the home grown PharmD was designed, but then highlighted the lack of awareness among faculty members and students on what the PharmD really entailed. Similar findings from a survey in Jordan showed 66% of respondents who had enrolled in a PharmD were ignorant about what it really entailed on enrolment (Abdelhadi et al., 2014).

5.3.3 Poor Clinical Training Capacity

This referred mainly to inadequate number and competency of academics and preceptors to run the PharmD programme. The 'capacity' concept was discussed in chapter 3. Only 0.8% of the pharmacy workforce is in academic practice (Ekpenyong et al., 2018). Also, the clinical pharmacy department which would largely be responsible for the PharmD program was currently one of the smallest departments in most schools (Awaisu, Mohammed and Yakubu, 2016). There were few skilled clinical pharmacists and preceptors for the hospital-based part of the training (Erah, 2011; Olurinola 2003; Babar et al., 2013; Chanakit et al., 2015). Hence, a consensus that capacity needs to be built if the program would be successful.

"We need pharmacists who are in the hospitals who are thoroughly grounded in clinical practice for them to offer preceptorship roles to the students which is largely unavailable even academic staff who also have exposure in the hospital who are not just coming from the classroom, who have been exposed and so in that way you have a good blend of the training that the graduate will receive" (Dean SE University)

With clinical pharmacy practice not being well-defined (Jamshed, 2007; Babar et al, 2013), locally available opportunities to improve it were few and far between.

"…when these students came on rotation, we taught them chlorpromazine equivalence of other antipsychotics, if you want to switch you base it on chlorpromazine. Do you know that after teaching these students, a professor in their school told them there is no such thing? Meanwhile, he doesn't know!!

Why not use google and check if you don't know? So, the students failed it during their viva in school because the lecturer doesn't know, and he assessed them based on the knowledge he has." (SSFG, Hospital Pharmacist)

A few participants were not worried about the low academic capacity stating that the desire to begin the programme would encourage capacity building and every programme must begin from what is available. When the PharmD began in the USA, there was a 56% faculty vacancy in clinical pharmacy due to lack of qualified candidates (Hadi and Hughes, 2009), there were also difficulties in getting an adequate number of hospital based preceptors (Scheckelhoff, 2008). They believed that every new program faces teething problems and should not be abandoned on this account.

In this study, capacity was also measured by availability of modern infrastructure in adequate numbers. Poor infrastructure is a well-documented barrier to education in LMICs (WHO 2006; Duze, 2010; Matowe et al., 2013; Roush et al., 2013; Anderson et al., 2012). It has also been discussed in chapter 3 when describing the Nigerian pharmacy education status, so it can be expected that the pressure on already insufficient resources and deficient infrastructure would increase with the PharmD which is a more intensive programme of longer duration (Babar et al., 2013). This alongside system challenges such as poor institutional buy-in, poor government policy enaction and implementation, lack of training sites and practice-based facilities (Kheir et al., 2008) were seen as issues that already exist with the current BPharm which would only get worse with the PharmD.

"The current challenges have to do with upgrading facilities because we now have many more admission seekers for the PharmD program, so the pressure on admission is there. So, there is a need to upgrade manpower, facilities and infrastructure" (Dean SS University).

Infrastructural challenges identified are neither peculiar to the PharmD nor to the Nigerian context. Jamshed (2007) said the switch was made despite the debilitating state of their pharmacy colleges, lack of clinical expertise, and curricular inadequacies. The decision to make the switch has highlighted inadequacies and requirements for successful implementation. If this decision is backed by a sincere desire for progress, then it should serve as a motivator for educators' clinical capacity building.

5.3.4 Medical Doctors' Resistance

The cold war between doctors and pharmacists, due to pharmacists taking on increasingly significant clinical roles and offering direct patient care, has been extensively discussed in literature (Babar et al., 2013; Hassali et al., 2013; Islam et al., 2014; Scahill, Harrison and Sheridan, 2009; Lalonde et al., 2011), and briefly described in chapter 3. In this study, some participants reported that doctors thought that with the PharmD, pharmacists would encroach into

their profession, now possessing skills that have been their exclusive privilege hitherto. With added medicines expertise that pharmacists already possess, doctors were likely to feel threatened and this was said to be the major reason for the resistance. Another reason was the doctor title that PharmD graduates were going to bear afterwards. This, they said, was not well-received by the medical community who claimed that this was the only reason pharmacists were clamouring for the PharmD.

"*I must tell you that on the other hand, our counterparts in the medical profession didn't see it this way. Probably they were just looking at that title doctor and to them in our own thinking here the word doctor is exclusively for medical doctors and they didn't want anybody to answer that name and because of that they were doing all in their power to ensure the PharmD didn't see the light of the day. And that was why it took a very long time for it to be approved but the simple truth is that it has nothing to do with the title it has more to do with the patient (Director, Accrediting Body)*

Literature on physician–pharmacist relationships in Pakistan, Kuwait, Qatar, and Sudan suggest that physicians remain uncomfortable with pharmacists recommending drug therapy for patients, even for minor illness despite pharmacists supposedly being the "experts" on drugs (Islam et al., 2014). This turf protection has also been reported in South Africa (Gilbert, 1997). The case is not much different in some developed countries like New Zealand (Scahill, Harrison and Sheridan, 2009), and Canada where Lalonde et al. (2011) reported that despite improved patient care outcomes when pharmacists ordered diagnostic tests and optimized medication dosages within a physician–pharmacist collaborative care model, the perception of physicians was unfavourable to the success of this model, as they felt insecure and threatened.

A similar pattern was observed in this study. Participants reported that a major barrier to the PharmD was inaccessibility or disparity in access to placement sites caused by doctors' resistance to pharmacists' clinical practice as described by Erah (2011). Having experienced similar challenges with clinical clerkship for the BPharm, they thought that this may prove prohibitive to the successful implementation of the PharmD. Studies on physicians' perceptions and expectations of pharmacists' roles were found to influence the advancement of clinical pharmacy practice in other countries (Lo, Hu and Ung, 2014; Khan et al., 2014)

"I must say that it wasn't easy because even till today the medical doctors still don't see reason why pharmacists should go for PharmD. They are still protesting to the extent that as it stands today, one of the biggest challenges in the introduction of PharmD is accessibility to hospitals, access to patients in the hospital. They are not really welcoming pharmacists as part of the healthcare team on the bedside, they don't want pharmacists to come in. But

we all know that without that there's no way the pharmacists can effectively practice as PharmD professionals (Director, Accrediting Body)

The fact that hospitals are proposed training sites for PharmD students raises a problem. Doctors who manage hospitals decide if and when they allow pharmacists and students access to patients. This was caused by weak government policies to support pharmacists' access. The hospital policy restricts pharmacists to dispensaries and reserves the wards for doctors and nurses. Participants described differing experiences with access to the wards. Some did have access, and this made a difference. Despite differing experiences, there was a unanimous agreement that direct access to patients was required for the PharmD to be successful.

"The challenge I would see would be acceptance. Like I said some have problems with access to the hospitals and I mean complete access, not just a partial one so the problem will really be access to the teaching hospitals and acceptance by the medical practitioners" (Dean SW University)

Many cases of both subtle and overt resistance to the PharmD implementation by doctors were shared by participants. In the survey, over half (54.7%) stated that doctors' resistance was the major barrier to the implementation of the PharmD (see table 5.4 below).

Table 5.4: Count for PharmD implementation barriers variable

Rank Value	*Option*	*Count*	*Descriptive Statistics*
1	Medical Doctors' Resistance	676	Mode 1
2	Pharmacists Non-acceptance	94	
3	Poor academic capacity	304	
4	An overloaded curriculum.	162	
	Total (N)	1236	

A few participants also spoke about resistance from fellow pharmacists as well who did not support the switch, especially before it was approved.

"Part of the problem we had in the initial stages were even from among we professionals they didn't think it will work and some of them went out of their way to ensure that it didn't work, from within the profession. I will not go into the details but that was part of the problem" (Dean SS University)

Generally, participants stated that if the patient welfare was considered priority, health professionals would not have any problems working as a team to improve health outcomes. Also, the ability to work for the greater good of a team as opposed to fulfilling one's own interests has been identified as a core leadership competency (Doody and Doody, 2012). Hence, healthcare professionals need to understand and respect the unique contribution of their

colleagues and possess the skills to work effectively with them to obtain the best patient outcomes (Gilbert et al., 2000).

5.3.5 Curricular Overload

This has also been discussed earlier as a major challenge with the BPharm but despite the realization that the BPharm was overloaded, participants reported that the PharmD was an even heavier curriculum. It is understood that the amount of information and number of skills and competencies that learners have to assimilate, regurgitate, and demonstrate has exploded with the advent of the internet, and availability of new therapies and tools (e.g., distant learning, simulation technologies), as well as burgeoning accreditation requirements. No longer is adding curricular content and time for new topics a viable option (Darling-Hammond, 2010). Novel solutions need to be explored and training strategies should appeal to learners for advocated practices to be adopted for future utilization.

Curricula overload was highlighted by participants as they complained about students already breaking down beneath the BPharm load. Cases of suicide and attempted suicide due to workload were discussed. The clinical content of the BPharm curriculum was increased in the PharmD and very little, if anything, taken away from the curriculum due to "curricular territorialism" where academics refused to give up portions of their courses considered excessive, repetitive, unnecessary or obsolete by others, to create room for more relevant content.

"The curriculum is already overloaded, so, how do we bring such things? But these are things that are actually needed. And we also have challenges with our training: a situation you have this culture of every department holding on to whatever they think is their own, that is not helping the overloading of students" (SWFG, Academic Pharmacist).

A few participants expressed fears that with the currently proposed curricular load, the PharmD would go the way the BPharm had with students having no choice but to memorize rather than seek to gain an understanding of taught concepts due to insufficient depth in treatment of subjects (WHO, 2006; Jamshidi and Cook, 2003). 13.1% of respondents in the survey thought it was the major barrier to the implementation of the PharmD.

5.3.6 National Inequities

Many national issues are attributed to inequities, tribalism, favouritism and a focus on the factors that divide. Some stakeholders raised similar issues with reference to uneven distribution of national resources for successful implementation of the PharmD. Several inequities were discussed such as geopolitical inequities or tribalism. They stated that Northern Geopolitical zones were often favoured above the southern in terms of facilities and infrastructural development despite fewer pharmacists being trained there.

"A typical example is a situation when about 50% of people that registered for the special PharmD in Uniben are from the South-East and South-South yet there is no preceptor training site in the South-East or South-South, and that is a tribalism-based decision that is not based on statistics, or justice or equity, so those are the kinds of things that can throw a nice program out of the backseat" (Dean SE University)

Age inequities were discussed in light of the gerontocratic leadership style (Okoduwa, 2006) that prevails in Nigeria as well as several other African countries. This they stated, was the reason for non-progress in several sectors which were lacking fresh ideas as a result. Participants highlighted the need for youth to be given a seat at the leadership table for PharmD decisions, and 54.6% of survey respondents agreed or strongly agreed to this. A median rank of 2 suggested a tendency for stakeholders to agree to this statement. The neutral rank however had the highest frequency and likely reflected the Nigerian culture that did not really encourage age diversity despite evidence for the benefits of diversity (Gomez and Bernet, 2019) in improving an organizations' performance.

On the other hand, the implementation of gender equity policies which were common areas of contention in Africa, and indeed, globally, was not an issue for Nigerian pharmacists. Female pharmacists reported that they were as well treated as their male colleagues. This opinion was nationally perceived as represented in the survey where 74.4% of the respondents either disagreed or strongly disagreed that female pharmacists were not given the same professional opportunities after graduation as their male counterparts. This may be because pharmacy is a female-dominated profession (Janzen et al., 2013), hence may not reflect national realities of gender equity.

Understanding that equity should be process driven, as it is not often achieved without effort, participants were asked if Nigerian pharmacy education fosters national equity through processes such as admission diversity and staff recruitment, most respondents (61.9%) in the survey agreed or were neutral. A median rank of 3indicated participants were more likely to be neutral to the statement.

Insecurity was another challenge attributed to geopolitical and religious differences and inequities. A state of unrest especially in the North East geopolitical zone was a cause for concern and had made both students and pharmacists stay away from that zone for study or work thereby leading to maldistribution of pharmacists. This was also the reason I was unable to travel there for research.

"Nobody in the South will want to leave and start going to Maiduguri (a northern city) to work at this present time isn't it, primarily security based because from my observation the schools there (in the north) are much more

furnished and equipped than what we have in the South, so I wouldn't say it is because of infrastructure or facilities but primarily security-wise" (Dean South South)

A majority of survey respondents (88.7%) agreed or strongly agreed that insecurity, due to tribalism, ethnic and religious violence in certain geopolitical regions, had increased apprehension to schooling in those areas.

5.3.7 Other Barriers

Despite the long-standing clamour for the PharmD, a few participants said that pharmacy schools were not ready for the programme change, going by their slow adoption after approval (Ogaji and Ojabo, 2014). The usual procedure which would involve approval by the senate of each university had been met by implementation bottlenecks. Other system issues such as a lack of integrity and disrespect for collaborative efforts were also touched upon by a participant who was at the meeting where the PharmD curriculum was designed following intensive deliberations.

"The education conference ….it involved practitioners, academics, regulators, pharmacists from the UK, USA and Canada….were all involved in developing the current PharmD but the PharmD that came out of that meeting was not exactly what we have after it went through the academic committee, it is not the same". (*SWFG, Academic Pharmacist).*

Several other factors were also discussed as possible implementation barriers such as a poor staff motivation, poor maintenance culture (Matowe et al., 2004), poor government funding (Akinyemi, 2013) made worse by corruption (Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015) and misappropriation of meagre funds available (Ololube, 2016) , tribalism, as well as several other within-country peculiarities. These were mostly already existing issues with the BPharm.

Other issues raised included the lack of structure and career progression for PharmD graduates. Following the usual clinical career pathways, participants thought that there ought to be residency programmes after school that enabled graduates specialize in a chosen field. These were not in place for the PharmD and the government policies were yet to reflect a difference between the BPharm and PharmD holder.

My apprehension is that we may not fully get the migration from BPharm to PharmD right, there are many factors that interplay in Nigeria…You know our country, there is tribalism and several other factors for example currently they are building preceptor training sites in preparation for the PharmD and all the sites are in the North whereas we have almost all the pharmacy schools in the south" (Dean SE University)

In summary, while a few participants were apprehensive about the success of the PharmD switch given the magnitude of likely impediments, others thought these barriers were surmountable. There was felt enthusiasm backed by confidence to make the switch among many academics despite potential barriers and concerns around effective implementation. This ardour was not shared by pharmacists practising in other sectors who feared that weak government policy, low academic capacity, and other aforementioned barriers may lead to a programme of poor quality despite best intentions.

5.4 Implementation Facilitators

Despite the presence of significant barriers, facilitators to the implementation of the switch were also mentioned. These were particularly important since implementation had been identified as a major issue in Nigeria (Okoroma, 2006). The curricular design which accommodated all departments in school was a facilitator for implementation and greatly reduced likely friction that may have arisen as a result of perceived marginalization of any department. Student participants were excited about the PharmD and the prospects for direct contact with patients in hospitals. This they said would consolidate their theoretical knowledge (Ting, Wong and Thang, 2009). By seeing and doing, they would remember more. Another facilitator was the doctor title (Deshpande, 2013). This was pointed out as a motivator by a few, most participants said it was just an additional benefit. A major facilitator was the training being put together by PCN, an effort in capacity building towards implementation for the PharmD.

5.4.1 The Home-grown PharmD

Based on stakeholders' responses, one of the major facilitators for the PharmD switch was the curricular design for a home-grown PharmD programme. This was different from the PharmD programmes in other countries in the sense that it was not an entirely clinical programme. Stakeholders described this as the Nigerian version of the PharmD which was an attempt to embrace global change while ensuring that the country peculiarities were considered as recommended in literature (FIP, 2013; Anderson et al., 2009; Hadi, 2010). Curricular content from the previous BPharm was retained and clinical content added to each year with a final year of hospital-based training to produce patient oriented pharmacists who are still in touch with other aspects of pharmacy practice.

This decision to design a different PharmD programme peculiar to the needs of the Nigerian society greatly increased the acceptability factor as educators and pharmacists in other areas of practice felt secure and did not feel they would lose relevance after the PharmD is implemented. This was in line with the sustainable transition suggested in literature (Hadi and Hughes, 2009; Ghilzai, 2008).

"when they were trying to introduce the PharmD some of us felt that it was going to deviate the attention of pharmacy towards the clinical aspect and that is one of the things that we stood by to make sure that everything about pharmacy is still intact. The only addition is the clinical aspect, the last one year where they will have an area of speciality" (Dean NE University)

The PharmD being a hospital-based programme, which would provide real-life experience, was also a major facilitator as stakeholders had passionately complained about the theory-focus of the BPharm which was not helpful in providing the requisite skills for successful practice as mentioned in chapter 3, and highlighted by numerous studies (Babar, 2005; Ghilzai, 2008; Ghilzai, 2009; Mangasuli et al., 2008; Ikhile and Chijioke-Nwauche, 2016; Mendonça, Freitas and Ramalho de Oliveira, 2017).

5.4.2 Foreign Collaboration

Poor capacity and lack of resources and technology in LMICs has been extensively discussed, and to this end, foreign aid and co-operative partnerships have been needed and recommended (Aronson, 2004) for the development for LMICs for many years. However, the notion that foreign aid does not produce sustainable improvements in sub-Saharan African countries is also documented (Doucouliagos and Paldam, 2009). Despite this, it was clear that stakeholders were excited about the prospects of, and trusted that, foreign collaboration would build capacity towards the implementation of the PharmD. Clinical Pharmacists from the USA were therefore invited to run a 'Special PharmD program' for clinical educators and preceptors all over the country to undergo hands-on training spanning clinical skills, interprofessional interaction, preceptorship, among others to enable them start the PharmD programme in their various institutions. This capacity building programme was facilitated by PCN and hosted by the model school.

We've started encouraging them to build up the manpower by first introducing what we called the special PharmD program. It's just a one-year program or like an abridged program that is being run, and the essence of that program is to build the critical manpower needed for us to effectively kick start the PharmD program. And what we are saying with this is every pharmacist whether in the clinical setting or not should come into this program at least because one way or the other you would have a role to play either as a lecturer to lecture them or as a preceptor during internship training to precept them (Director, Accrediting Body)

This collaboration was a facilitator to the success of the PharmD serving as a stopgap to build capacity and provide useful links for the future.

5.4.3 Students Interest

Student interest and motivation is a major determining factor for success in any course of study, by influencing students' decision-making around their

learning, and effort put into study (Hidi and Renninger, 2006). Students were engaged in this study and showed keen interest in the new programme. Students thought the switch to the PharmD will improve their practical skills, having complained of the theory focus of the BPharm curriculum. It was clear that students considered clinical practice to be a major area of focus for pharmacy training by their frequent reference to it and their desire for earlier exposure to clinical training.

There was also the notion that PharmD graduates would be better paid than their BPharm counterparts, similar to notions shared from the study carried out by Abdelhadi et al. (2014), even though there is no evidence to back this up. Studies have also shown that professionalism of pharmacy students is positively associated with student's satisfaction with the program (Tak et al., 2019). They tend to perform better if they perceive the importance of a programme (Eccles and Wigfield, 1995), or show interest (Renninger, Hidi, and Krapp, 1992). Hence, students' interest and perceived satisfaction with the PharmD will likely lead to better engagement.

"Most especially the clinical aspect of pharmacy I would like to see improvement in that area, we would need more time to go for ward rounds. It would be nice if we have clinical pharmacy exposure earlier than the final year" (NWFG Student).

Among students there was a consensus on the superiority of the PharmD. They did not mind the heavier course load and longer duration of study. The opportunity for a full year of clinical rotations in the final year of the PharmD was the major reason for this. While the importance of experiential learning to the consolidation of theoretical knowledge has been documented (Ting, Wong and Thang, 2009; DiFrancesco, 2011), it was clear from this study that students also prioritized practice-based learning over theoretical.

"Like you said, I would be very direct. I don't really like the way the curriculum is structured, it is more of theory based. It stereotypes students to theory, reading and passing exams. The laboratories are not really equipped, even when they are equipped the technical knowhow is not there. And again, at my level now the final year, I have found out that much of the knowledge I have is theory. I cannot really boast of practice apart from little experience I had during my IT when I went to industry because I was opportuned, how about those that were not opportuned." (SEFG Student)

5.4.4 Doctor Title

After the 6- year PharmD, graduates are awarded the doctor title. This was a major theme of discussion during the interviews. It was a clear benefit of the PharmD programme to the extent that some participants thought it was the only motivation for the PharmD switch. The privilege of using the doctor title was highlighted by Deshpande (2013) as one of the benefits of the PharmD in

India. In the Nigerian pharmacy context, having experienced professional identity crisis and given the much talked about non-recognition of pharmacists in LMICs (Ahmed and Hassali, 2008; Jamshed and Babar, 2009), some participants felt that the PharmD was a prestige marker since they would be called 'doctor' afterwards. The hope was that this would improve their professional status.

"If you ask me what is the difference between PharmD and BPharm, my honest answer is that there is no difference, why people clamour for PharmD if we should be sincere to ourselves here in Nigeria we have been facing challenges before now especially in terms of our professional colleagues, medical doctors intimidation, when we are talking about psychological intimidation we are getting in the hospitals….now pharmacists are beginning to feel inferior to some extent and we want to be recognized as doctor" (SSFG Hospital Pharmacist).

Other participants thought that this notion of the PharmD being all about the doctor title was totally false and a distraction strategy employed by the medical doctors to discredit the programme since they could not stop it from being approved. They believed the PharmD would be beneficial to patients and the patient should be the focus. The title was just an added advantage. The title was described as one of the reasons for resistance from medical doctors and some senior pharmacy professors who didn't think the title should be borne by fresh pharmacy graduates and were worried that with the title pharmacists may think they are at par with medical doctors or PhD holders.

"…..*somebody will just come out now, fresh undergraduate and be bearing doctor, something that took me many years, some of those sentiments and trivialities were coming up" (PharmD Proponent)*

Collier (2016) argues that this title may be the real hidden reason behind the PharmD switch in many LMICs, being described as a coveted title because it draws respect, indicates expertise and years of study, and earns patients' trust. In Nigeria, and several other countries, physicians, surgeons, dentists, optometrists, chiropodists, PhD holders, and now pharmacists describe themselves as doctors. In 2009, physicians and surgeons in Ontario Canada were worried that the lack of consistent requirements for professionals permitted to be called "doctor" would be confusing to the public who typically associate the title 'doctor' with those who provide medical treatment and advice. Following a call for restrictions to the use of the title as a measure of public protection, there has been a law in Canada that the title of doctor be reserved for physicians alone (Asfour and Winter, 2018). This has sparked some debate on who should be 'permitted' to use the doctor title. To answer this question the doctor title should be examined from both linguistic and historical standpoints.

The word ‘doctor’ has its roots in the latin word ‘docere’ which means to teach or a scholar. In the middle ages the title was used to describe eminent scholars who were accorded respect and prestige. In the 17th century, medical schools especially in Scotland started addressing their graduates as doctor because in those days, graduates obtained a bachelor’s degree before entering medical school but logically, a degree post a bachelors should be a masters and not a doctorate (Asfour and Winter, 2018).

Hence the argument, if we go by historical and linguistic standards, no undergraduate degree holder is entitled to the doctor title regardless of the health profession. The doctor title should be reserved for holders of a doctorate who teach or are scholars. But if these rules have already been bent to accord medical professionals respect, other regulated health professions are deserving of similar respect and can demand same title. As long as there is no intention to mislead patients and every professional is aware of their abilities and boundaries. In this study, participants from academia spoke about the importance of not getting carried away but ensuring that service delivered merits the title.

5.5 Discussion

This chapter discusses an attempt at improving the global and local compliance of Nigerian pharmacy workforce development by changing the undergraduate programme. Stakeholders were enthusiastic about the approval of this switch having taken about 18 years from the time of first mention, but at the same time sceptical about the smooth transition and successful implementation given aforementioned barriers, especially considering that the PharmD switch in the LMIC context had been a topic of intense debate and wide-spread criticism in literature (Jamshed et al., 2007; Jamshed et al., 2009; Hadi and Hughes, 2009; Chanakit et al., 2015; Babar et al., 2013), being described as dramatic and too rapid (Kheir et al., 2009).

While there have been a lot of published materials on the switch, most publications have been anecdotal: commentaries (Jamshed et al., 2007; Jamshed et al., 2009), letters (Hadi and Hughes, 2009), and studies (Chanakit et al., 2015, Babar et al., 2013) that discussed potential and existent challenges. It was therefore important to empirically understand the motivators for, and discuss barriers and facilitators to, its implementation in order to determine if this switch was an efficient decision in the Nigerian context, especially considering that the success of the PharmD transition has been mainly attributed to planning and implementation (Jamshed and Babar, 2009), and there has been no record of meaningful progress in other LMICs that made same switch (Babar et al., 2013).

Findings revealed that keeping up with global trends was the major motivator for the PharmD switch. There was rarely a response to the motivation for the switch that did not directly or indirectly refer to the global paradigm switch

towards collaborative patient-focused practice, leading to an increased awareness of the urgent need for undergraduate training to change accordingly. Understanding that the change cannot occur all at once, a sustainable and gradual change termed a 'home grown PharmD' was attempted.

In other LMIC contexts, similar attempts at a sustainable improvement of clinical education yielding a hybrid curriculum which retains the pharmaceutical sciences while upgrading clinical content has been dismissed as simple additions to an existent curriculum in a bid to use the PharmD label (Babar et al, 2013; Hadi, 2011). And this 'label', further branded the LMICs tool for universal employability (Anderson and Futter, 2009; Jamshed, Babar and Masood, 2007), stating that PharmD graduates in many LMICs are mainly trained to register afterwards in the USA. However, an argument that the need for global mobility has made it necessary for there to be some form of uniformity in degrees and duration of training has also been made in literature. For example, pharmacy foreign conversion exams in the USA now only accept pharmacists that graduated from a five year program (Ahmed and Ahmad Hassali, 2008).

In this study, some participants were not in support of the switch, they didn't see a genuine need for it, did not understand it, or simply wondered about the motivation for this change since clinical pharmacy practice was not well-established, and clinical roles were still being contested by the medical profession. For those in support of the switch, it was interesting to find out that their solution to pharmacists feeling overtrained and underutilized was yet more clinical training. Also, while discussing ways to maximize pharmacists training and skills in response to increasing clinical demand, pharmacists thought they could provide the best patient care when they were given a 'place' in the hospitals. Meanwhile research has shown a transition from hospital-based care to community-based care (Lueddeke, 2012; Frenk et al., 2010), and it is widely known that community pharmacies are often the first port of call for health services in Nigeria as well as many LMICs. The focus should therefore be responsible provision of primary care in communities especially in rural areas where quality health services are largely unavailable.

However a lack of clinical and patient-care expertise identified as a major barrier in this study would not facilitate pharmacists role as primary care providers, similar to reports from other studies carried out (Babar et al., 2013; Chanakit et al., 2015; Frenk et al., 2014). This was a major issue highlighted in literature as the reason for the impracticality of the switch in the LMIC context (Jamshed, Babar and Masood, 2007), despite HICs having similar difficulties at the inception of the PharmD (Chanakit et al., 2015; Schekelhoff, 2008; Hadi and Hughes, 2009). This lack of experiential clinical training was aggravated by doctor's resistance to pharmacists' clinical exposure and was the greatest

barrier identified by survey respondents despite the potential impact of an improved clinical practice on patient outcomes. Worthy of mention is the fact that the major reason behind the 18 years gap in approval was the resistance by medical practitioners. This cold war between doctors and pharmacists is an age-old one and has severely hampered the growth of the Nigerian health sector. It is however not peculiar to Nigeria alone. Published literature on Physician-pharmacist relationships in Pakistan, Qatar, Sudan, Kuwait, and even Canada has shown that physicians feel threatened by the expanding roles of pharmacists despite improve patient care outcomes (Islam et al., 2014; Lalonde et al., 2011). Until health professionals are able to work as a team, the patients will continually be deprived of the holistic benefits of collaborative clinical practice, and opportunities for inter professional education will not be possible.

A few participants also thought that the clamour for a program change may be secretly driven by a desire for professional status upgrade that comes with the doctor title similar to published literature (Babar et al., 2013). This was thought to be a fringe benefit by others and not a direct motivator for the switch. There were suggestions to improve the already existent BPharm curriculum by improving time allocation and scope of clinical pharmacy and pharmacy practice courses, while reducing some of the content of the basic pharmaceutical sciences similar to suggestions by Fakeye et al, (2017) rather than the switch. Some facilitators identified for the success of the switch included students' interest and enthusiasm for the switch, and capacity building programmes for clinical educators and preceptors which were being run in collaboration with clinical pharmacists from USA.

Clearly, most identified issues were neither peculiar to the PharmD nor to the Nigerian context. They already exist with the current BPharm, hence would have to be handled otherwise the longer duration and intensity of the PharmD may magnify such issues to an extent that they become crippling to pharmacy education progress. Whatever the reason for the PharmD switch, it is important to engage with countries and stakeholders who feel a need to significantly alter the model of pharmacy education in order to meet both global and local needs (Yanchick, 2008). Working with them to identify local needs and develop the best model of education may be more useful than criticism. Similar to a statement in Flexner's report (1910), if the profession of pharmacy is viewed as a social instrument for delivering health by assuring access to essential drugs and promoting rational use of same, instead of a special interest for attaining status and privilege, the best undergraduate program based on societal healthcare needs would be selected. If the PharmD is the best programme in the Nigerian context, then efficient ways of transitioning to it in a needs-based way should be prioritized.

5.6 Conclusion

The PharmD switch in the LMIC context is an effort to keep up with global trends around a patient-focused practice, contribute meaningfully to the health team, build increased confidence to provide primary care services, and directly access patients. However, as currently planned, it embodies a juxtaposition of both old and emerging challenges, without evident superseding benefits that counterbalance the challenges. While a programme change or upgrade may be necessary, given identified gaps in Nigerian pharmacy education, this change must be thoughtfully undertaken with adequate consideration given to the available resources and already existent challenges. A programme designed to meet societal healthcare needs while addressing identified challenges would be a suitable upgrade. The name which is assigned to this program is less important than the value it adds to the healthcare quality: the quality of students produced, the relevance of their training to local needs, ensuring the programme is equitably experienced throughout the country, and is run in an efficient and cost-effective manner.

The eventual success of this program would depend on an enabling practice environment, capacity building, policy strengthening, infrastructural upgrade, workload balance, curricular delivery, and a favourable working relationship with other healthcare professionals among other factors. Findings from this study could aid education leadership and decision makers to design a needs-based programme, taking into account national concerns and priorities and several other extrinsic factors that may determine how well this programme can work. Further benefit can be obtained if identified motivators, facilitators, and barriers are also applied to countries with similar context planning to make the same switch.

6 Chapter 6: Are Nigerian Pharmacy Programmes (BMAS) Fit-for Purpose?

6.1 Introduction

It has been argued that fit-for-purpose workforce development yields graduates that are better equipped to meet the healthcare needs of the society (Anderson et al, 2009; Anderson et al., 2010). Previous chapters have discussed the three major domains for developing a fit- for purpose pharmacy workforce in Nigeria as described by stakeholders, as well as several descriptors within these domains. This chapter aims to determine how the Nigerian pharmacy undergraduate curriculum reflects these fitness-for-purpose domains and descriptors (which serve as local standards) as well as global quality standards outlined in three major workforce development policy documents. Going by stakeholders' summary definition of fitness-for-purpose as global compliance-local relevance, education fitness-for-purpose can be measured by how well acquired competencies meet both local and global required competencies for optimal healthcare service provision. With this fundamental principle it is possible to look at two aspects of the program, the curriculum and the level of satisfaction and confidence graduates from that program have to meet societal healthcare needs.

The 'ideal' curriculum has been conceptualised as being dynamic, transformative and suited to current and future needs, with the ability to set out competencies and sustain those competencies within contexts of rapid change. What graduates are or should be able to do in terms of knowledge, skills and attitudes, has been discussed in chapter 3, this chapter focuses more on what the programme is able to do by presenting results of a Qualitative Content Analysis of the benchmark minimum academic standards (BMAS) for pharmacy undergraduate programmes.

The steps described by Schreier (2012) in chapter 2, were the basis for the qualitative content analysis carried out in this chapter. The BMAS was mapped both to local and global recommendations. The coding frame used combined domains derived from study data (stakeholder responses) and global recommendations for a fit-for-purpose pharmacy programme outlined in the Global Competency Framework (GbCF) (FIP, 2012), Workforce Development Goals (PWDGs) (FIP, 2016) and Nanjing Statements (NS) (FIP, 2017). The use of more than one document is better for analysis (Bowen, 2009), though the question is about quality not quantity. This composite was analysed using three key fitness-for-purpose domains: education capacity, professional relevance, and systems efficiency. This was a final step towards determining needs/gaps in the Nigerian pharmacy programme. The documents were analysed for content and meaning to determine if there were matching descriptors. Mapping was done at the national level in keeping with the country-wide scope of this study.

6.2 Composite Coding Frame Development

Thematic analysis of stakeholder responses conducted in the earlier phase of the study yielded 55 codes relevant to workforce development standards. Subsequent analysis of FIP documents led to six codes being modified, and 23 added to make 78 codes. These were all categorized into curriculum and standards domains and the standards domain further categorized into the three thematic domains obtained earlier in the study which best described the essence of the code (Morse, 2008). FIP documents were read and re-read to identify relevant codes related to requirements for workforce development. These documents which focused on global harmonization of core-competencies and practice-based expectations of pharmacists were useful for curriculum mapping and comparative analysis. They were chosen because they represent the global consensus on education capacity as well as capability and competencies for early career pharmacy practice.

6.3 Qualitative Content Analysis Overview

The Basic Minimum Academic Standards (BMAS) is the Nigerian pharmacy undergraduate education standard document. It consists of two parts: Academic standards and the curriculum. The curriculum in turn is specified for two different programmes: BPharm and PharmD. As a result, codes (n=78) from composite coding frame were categorized into Standards (n=50) and core curriculum (n=28) and tabulated (Table 6.1). In the standards section of analysis, the document yielded a total of 80 codes which were assigned to 36 standards. 14 standards were not matched, hence designated as empty codes. Fourteen standards from the coding frame were modified during analysis (designated an asterix and red annotation on the table), and one developed. In the curriculum section, the BMAS document yielded 88 codes for the BPharm and 91 for the PharmD which were assigned to 24 standards each. Four standards were not matched in each case, hence designated as empty codes. Three standards from the coding frame were modified during analysis (designated an asterix and red annotation on the table), and 8 developed.

Table 6.1: Content analysis overview

	Standards	Curriculum	
Total	50	28	
		BPharm	**PharmD**
Matched	36	24	24
Frequency	80	88	91
Empties	14	4	4
Modified	14	3	
Created	1	8	

Categorization of the coding frame into domains showed that professional relevance was mentioned most by BMAS document, with 56% of the codes. However, the specific standards category with the highest number of codes

were quality assurance and an adequate number of qualified staff both with eight codes each within the education capacity domain.

The domain with the least number of codes was systems efficiency with just about 8% of codes. This was likely the case because the BMAS did not extensively discuss requirements for an efficient system or ways to maximize student outcome given available resources. The results are presented within each domain and the coded descriptors discussed extensively.

6.4 Standards Section

6.4.1 Domain 1: Education Capacity

This referred to the extent to which pharmacy programmes met both national and global standards and how these standards were ensured and maintained. FIP documents used in composite coding frame recognized education capacity as a fitness-for-purpose domain. The PWDG document (FIP, 2016) had the first goal in the academy cluster called academic capacity (*PWDGs 1.0*) which focused on engaging with stakeholders and development policies to ensure fit-for-purpose education according to national health resource needs. This could be achieved by ensuring national quality standards are met, engaging in interprofessional education (NS 2.7), a focus on developing clinical educators, as well as attracting young pharmacists to all areas of practice. This was the second most coded domain during analysis of the BMAS.

Some of the standard codes within this domain include globally relevant yet locally applicable education, quality assured education, needs-based curriculum, up-to-date pedagogies, adequate number of well-qualified staff among others. The two most coded standards within this domain were quality assured education and an adequate number of well-qualified staff, each with eight codes (See table 6.3).

6.4.1.1 Quality Assurance

The importance of quality assurance to fit-for-purpose workforce development is documented by several studies (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008; WHO, 2013) as discussed in chapter 3. FIP documents (FIP, 2014; FIP 2016; FIP, 2017) also clearly identify quality assured education as an important fitness-for-purpose standard as can be found in the seventh cluster of the Nanjing statements *(NS 7.0)*. Quality Assurance is defined as a mechanism for identifying opportunities for making improvements in pharmacy education towards a sustainably competent workforce (FIP, 2017).

Participants emphasized the importance of quality assured education and equitable regulation to yield graduates of similar competence towards the achievement of fit-for-purpose development. The major local requirement for quality assurance reported by stakeholders was a need for fair, realistic, and

transparent accreditation policies which are equitably applied across all pharmacy schools, as has been discussed in BMAS *(1.6.2)*.

Global recommendations for quality assured education include: collaboratively establishing quality metrics for education (*NS 7.3*), which is the usual Nigerian practice described by the BMAS *(1.6.2)*, carrying out regular curriculum reviews *(NS 7.4)*, which has been described below *(BMAS1.6.6),* assessing competencies throughout the curriculum (*NS 7.6*) which is also practiced as can be found in (*BMAS 1.6.1*), as well as a formal accreditation system also discussed below *(BMAS 1.6.7)*. The third cluster of the PWDGs discusses transparent innovative processes for the quality assurance of needs-based education. Such as addressing academic and institutional infrastructure (*PWDGs 3.1*) as has been described in the resource verification exercise below, engaging with stakeholders to develop fair and effective policies, and implement these policies for quality assurance of pharmacy education as is done during the accreditation exercise.

The BMAS document (*BMAS 1.6.2*) described several ways that the quality of the undergraduate pharmacy programme should be assured and maintained. One of which is a formal system for quality assurance of pharmacy education in Nigeria undertaken independently by both the government and professional regulatory bodies. This exercise is undertaken in two major phases: resource verification and accreditation.

Resource verification ensures that the human and material resources deployed for the programme are available in sufficient quantity and of good quality, after which approval to begin the programme is granted. Three years into the five-year programme, accreditation would occur.

The accreditation exercise ascertains the level of compliance with set standards (Uys and Coetze, 2012) in the BMAS every five years. Four major areas are evaluated: academic matters, physical facilities, library and staffing. For full accreditation a school must have 70% score in all four areas, any less and they would have interim accreditation. If less than 60% score is given, accreditation is denied and the school must stop admission into the programme until all deficiencies have been remedied and successful accreditation conducted. This quantitative appraisal and pre-knowledge of resource requirements also ensures that standards are equitably applied across all schools.

The accreditation, as described by the BMAS, "*recognises education institutions for a level of performance, integrity and quality which entitles them to the confidence of the educational and professional community, the public they serve and employers" (BMAS 1.6.7).* It also assures the international community that the programmes of these institutions are of high standards and graduates are fit for employment and further studies.

Another quality assurance mechanism reported in (*BMAS 1.6.2*) involves inviting an external examiner to vet and moderate the programme of courses and examinations in the various subject areas to cover the professional years. This makes room for an unbiased evaluation of the programme. The external examiner's report is presented to the vice chancellor and made available to the department for appropriate action.

Yet another quality indicator is an established system in which students evaluate courses delivered to them through questionnaires at the end of each semester (*BMAS 1.6.5*). This is part of continued course improvement.

Finally, maintaining curricular relevance and fitness-for-purpose by carrying out periodic curriculum reviews has been recommended by the BMAS (*BMAS1.6.6*). This should be done once in five years by a committee of senior staff and should include an assessment as to whether the aims and objectives of the programme as formulated are still relevant in dynamic professional and social contexts. It must be inclusive, as stated in the BMAS: "R*eviews shall endeavour to incorporate the opinions of relevant stakeholders such as students, staff, external examiners, employers, professional bodies, policy makers etc" (BMAS 1.6.6).*

Hence, standards stipulated in BMAS meet local and global quality assurance demands. By involving stakeholders in curricular decisions, carrying out five yearly reviews, having resource verification and accreditation exercises, assessing student competencies throughout the curriculum and the introduction of the post internship pre-qualification examination. However, going by stakeholder concerns during the interview phase, it would need to be demonstrated that these standards as well as appropriate policies are fairly and transparently applied.

6.4.1.2 Adequate Number of Qualified Staff

This is a globally accepted quality indicator for health professional education (WHO, 2006; WHO 2008; WHO, 2010), and an important descriptor for fitness-for-purpose reported by stakeholders in this study. Staff shortage is a global issue made worse by lack of training, and ongoing exposure to practice in order to maintain competence (Rigoli and Dussault, 2003; Anderson and Futter, 2009; Dayrit and Dolea, 2006) as discussed in almost all groups and interviews during the study. Staff qualification and adequacy were also important standards in FIP documents. Cluster six of the Nanjing Statements 'Resources and Academic Staff' discusses standards for academic staff involved in pharmacy workforce development such as "*possessing academic or professional experience to support their main area of teaching and research" (NS 6.6)*, which was basically rephrased in the BMAS which stated that "*academic staff should include persons experienced both in teaching and in providing patient care with appropriate balance to provide the desired spectrum of knowledge" (BMAS 1.7.1iii).* Active participation in knowledge

sharing and collaboration at both national and international level is recommended so is the need to constantly update teaching materials to ensure relevance and support future developments (*NS 6.9*). This corresponds to BMAS 1.6.6v which refers to the quality of teaching and learning material used as a measure of curricular relevance. Other recommendations for educator development include collaborating with preceptors and experiential learning sites (*NS 6.12*), interprofessional collaboration (*NS 6.14*), contribution to curricular decision making (*NS 6.13*), promoting active learning techniques in classrooms (*NS 6.10*), and engaging in continuous professional development (*NS 6.11*).

This was an important standard in the Nigerian context as shown by a section devoted to it in the BMAS. It was one of the major resource requirements (*BMAS 1.7.1*) for accreditation (see table 6.2). In the BMAS document, staff were categorized as academic (full-time teaching staff), professional (teacher practitioners especially clinicians), administrative support staff (non-academic staff that contribute to the smooth running of day-to-day activities), and technical support staff (maintain teaching and research equipment and contribute to the proper running of the laboratories). In terms of qualification, each staff, except graduate assistants are expected to have a minimum second degree and at least 70% of academic staff must be PhD holders. Opportunities for development as well as commitment to research and scholarship were reported as being pertinent for the quality assurance of pharmacy education. Addressing staff numbers, the BMAS stated that there should be a minimum of six full-time academic staff in each department, and the minimum staff-student ratio should be 1:15.

Again, the BMAS covers areas highlighted locally and globally for staff adequacy and qualification. However, according to stakeholders in practice, most of these standards were not upheld. There were no formal arrangements for staff training, even at early stages of employment. The requirement for experience in teaching and providing patient care could not be attained due to prohibitive policies described in chapter 5. Knowledge sharing as well as national and international collaboration are often not achieved due to lack of research grants and poor support for conference attendance. Several other requirements were not met due to time pressure, caused by increased workload, brought on by shortage. Some were direct consequences of the shortage such as the high staff to student ratio which was made worse by increasing admission numbers. Similar to quality assurance coding unit findings, in order for staff expertise and contribution to be optimized, these standards need to be followed through.

Table 6.2: Recommended minimum academic staff mix

STAFF POSITION	REQUIRED PERCENTAGE
PROFESSORS/READERS	20%
SENIOR LECTURERS	35%
LECTURER 1 AND BELOW	45%

Table 6.3: Breakdown of domain 1 codes

S/N	Domain	Coding Units (From study findings, GbCF, PWDGs, NS)	BMAS (BPharm and PharmD)	Notes
1	Education Capacity	Globally Relevant, Locally applicable education	1.6.6i, 1.6.6ii, 1.6.6iii, 3.2.3 **4 codes**	Science-practice balance
2		Quality Assured education	1.6.5, 1.6.6, 1.6.7, 1.6.6vii, 1.6.6ix, 1.6.6x, 1.6.6xi, 1.6.7i, **8 codes**	Includes quality improvement, Includes employers and graduates' feedback, Use transparent, published standards
3		Needs-based curriculum	1.6.3, 1.6.6, 3.2.1iv **3 codes**	Patient-focused, flexible, practice-based curriculum Including experiential education
4		Up to date pedagogies	1.6.6iv, 1.6.6v **2 codes**	Active self-directed learning
5		Useful and Timely assessments	1.6.1 **1 code**	
6		Adequate number of qualified staff	1.7.1i, 1.7.1ii, 1.7.1iii, 1.7.1iv, 1.7.1v, 1.7.1vi, 1.7.1vii, 1.7.1viii **8 codes**	Both academic and non-academic staff
7		Inspiring Learning Environment	1.7.2 **1 code**	
8		Up to Date Infrastructure	1.7.2, 1.7.3 **2 codes**	
9		Student/ Early career Support	**Nil**	

6.4.1.3 Other Standard Coding Units

Most of the other standard coding units such as a needs-based curriculum *(NS 2.1-2.4; NS 5.4; NS 7.4)*, up to date pedagogies, an inspiring learning environment, as well as up to date infrastructure were quality requirements for accreditation discussed in the quality assurance section above. In a similar pattern, they were covered by the BMAS but according to stakeholders not implemented in practice (Chapter 3).

Participants expressed dissatisfaction with the current techniques of assessment which encouraged memorization and rote learning rather than an understanding of taught concepts (chapter 3). A gap identified was the lack or insufficiency of oral assessments. Pharmacists who were likely going to utilize oral communication skills more than written ones in practice were assessed mainly by written tests which do not require application of taught concepts but theoretical knowledge. These tests were therefore unable to assess clinical competency as well as ability for independent self-directed learning as recommended by the Nanjing Statements *"Assessment of student learning should include an ability for independent and self-directed learning that is necessary for continuing professional development after graduation" (NS 4.4).*

In the BMAS, assessment was mentioned in various sections: graduation requirements, grading of courses, and evaluation. The usual techniques of assessment include practical sessions, continuous assessment, and examinations. Practical evaluation involved the performance of the student in the actual conduct of experiments and the reports produced, continuous assessments referred to formal and informal tests which could be quizzes, homework, term papers and practical exercises, and examinations were usually conducted for every course at the end of each semester *(BMAS 1.6.1).*

According to the BMAS, courses are graded by a combination of percentage marks and letter grades translated into a graduated system of grade points as shown in table 6.4 below.

Table 6.4: Grade point system

Mark (%)	Letter Grade	Grade Point
70-100	A	5
60-69	B	4
50-59	C	3
45-49	D	2
40-44	E	1
<40	F	0

"At the end of the semester the Grade point average is computed by dividing the total number of units x grade point by the total number of units for all course taken in the semester. Though the grade point average system is not

used strictly in pharmacy as other programmes it is computed to enable students compete for scholarships prizes and other exercises" (BMAS 1.5.4).

Candidates who fail certain courses but have obtained a set minimum credit pass may be permitted to retake the courses, but if less than the minimum credit unit will repeat the session.

Opportunities for oral assessment were not specifically mentioned but could be incorporated into some of the above-mentioned assessment methods. Whatever assessment methods are chosen, application of taught concepts in real life practice situations should be prioritized rather than reproducing lecture notes, as well as assessing the ability for independent self-directed learning which is a key attribute of lifelong learners. These were not clearly reflected in the BMAS.

Student (and early career) support was also not discussed in the standards section of the BMAS as can be seen in the table above. It was an empty code. Despite it being a major determinant for education success among students as reported by student stakeholders during the interview phase. Student support was described in terms of clear and purposeful training pathways to support study, post-registration, and post-graduation periods (PWDGs 2.1), early career maps and frameworks to support a seamless transition into early career practice and towards advanced practice (PWDGs 2.2), as well as structured approaches to early career mentoring systems to support novice practitioners to engage with peers and preceptors (PWDGs 2.3). The academic capacity goal of the PWDGs (*PWDGs 1.3*) recommends meeting national standards for student support. When these standards are not clearly stipulated, this may not be possible. The BMAS coverage of the education capacity domain was 8 out of 9 coding units (89%) which is good coverage.

6.4.2 Domain 2: Professional Relevance

This refers to the extent to which pharmacists were able to contribute to patient care and how the pharmacy programme prepares pharmacy students for current and future practice experiences and roles. It is the premise on which needs-based education is founded (Anderson et al., 2010; Sánchez, 2016; Zeitoun, 2011). It was the domain with the highest number of standard units mainly because units represented specific competencies. It was also therefore the most coded domain of all four. Both local requirements and global recommendations acknowledged the importance of professional relevance and globally connected competencies to the achievement of needs-based workforce development. Standard codes within this domain include a broad foundation knowledge, possession and applicability of both transferable and professional competencies, an evidence-based approach to education and practice, specialization and role specificity, as well as continuing professional development/lifelong learning. These were determinants for professional relevance as described by stakeholders. The

most coded standard unit was transferable competencies followed by professional competencies (See table 6.5).

6.4.2.1 Possession of Transferable Competencies

Transferable competencies can be applied to other fields of practice and are not peculiar to the pharmacy profession. The World Economic Forum report (WEF, 2018) reported that the key skills required by 2022 would mostly be transferable skills. This focus on transferable skills was likely reflected in both composite coding frame and BMAS document making it the most coded domain. This was also because of the number of specific competencies within this domain including communication skills, problem solving skills, critical thinking and reflexivity, supply chain management, leadership and management skills. The most coded sub-units were reflexivity, critical and analytical thinking, citizenship and patriotism, each with three codes.

6.4.2.1.1 Reflexivity, Critical and Analytical Thinking

Critical thinking and communication, documentation and lifelong learning have been recommended as global core competencies for every pharmacist (NS 2.8). Students must be able to critically assess scientific evidence especially those that relate to patient and population health (NS 2.6). Experiential education should also foster the development of critical thinking and problem-solving skills (Ting, Wong and Thang, 2009), and create opportunities for reflexivity through case presentations, discussions of patients notes, and care plans (*NS 5.1, 5.2*).

In the GbCF, certain behaviours outlined require critical and analytical skills such as assessing the primary healthcare needs of the patients taking into account the social and cultural setting (*GbCF 1.1.1*), accessing reliable information ensuring the most cost-effective medicines in the right quantity and quality, and making contingency plans for shortages (*GbCF 3.1.4, 3.4.2*). Hence proactive planning is an important part of analytical thinking. Other behaviours of a critical and analytical pharmacist include reflecting on one's performance (*GbCF 4.2.8*), recognising one's own limitations and acting upon them (*GbCF 4.2.7*).

The general philosophy of pharmacy education in Nigeria is "*to produce graduates worthy in character, capable of critical thinking, lifelong learning and knowledgeable in practice of pharmacy as a means of achieving optimal patient outcomes*" (*BMAS 1.2.1*). This philosophy is reflected in the aims and objectives of the programmes of study in the BMAS which highlighted critical and analytical thinking skills as being pertinent to the training of a well-rounded pharmacist. In addition to proficiency in knowledge, skills, and attitudes of basic and applied pharmaceutical sciences, graduates were also expected "*to be capable of independent analytical thinking and problem solving especially with respect to drugs and drug related problems both in human and animals" (BMAS 1.2.2iii)*. How this competency was reflected in

the curriculum or choices of curricular delivery remains unclear. Delivery and assessment techniques have not shown how these skills would be built or tested prior to graduation.

6.4.2.1.2 Citizenship and Patriotism

Citizenship and patriotism were major objectives for undergraduate study in Nigeria. Courses in citizenship and culture were quite useful for mutual respect and peaceful co-habitation considering the country's sociocultural pluralism. A general studies programme was offered to students as compulsory in the first year. The goal of this programme is to expose students to a course of liberal education through which they can expand their awareness of their social, cultural and natural environments (*BMAS 1.8*). However, citizenship and patriotism were not of particular importance to stakeholders going by their responses. This was also not highlighted by any of the FIP documents; hence, it was one of the created codes. This again may be an example of how cultural and social differences determine the concerns and priorities of education.

However, this seemed to be one of the major goals for the pharmacy programme going by the attention given to it in the BMAS. This was to be achieved by acquiring developing and inculcating the proper value orientation for the survival of individual and society, developing the intellectual capacity to understand, appreciate and promote peaceful co-existence. The expectation was that this would produce graduates with a broad knowledge of the Nigerian nation and people, which would promote mutual understanding and patriotism. Some of the courses offered include Nigerian people and culture, peace and conflict resolution, among others. In contrast, the focus for the FIP documents were leadership and management, critical and analytical thinking, Supply chain management and documentation skills.

6.4.2.2 Other Standard Coding Units

Continuing professional development (CPD) was one of the overarching competencies on which the relevance of all other competencies would depend. Due to the rapid proliferation of knowledge (WHO, 2006; Frenk at al., 2010), the lifespan of a skill or competency has been drastically reduced (WEF, 2018), hence the need to continually update knowledge and skills (Wilson et al., 2005). This need was acknowledged by the BMAS. Having acquired a broad foundation knowledge (*BMAS 1.2.1x*), pharmacists must independently seek continuing development to remain relevant in practice. Understanding the dynamic nature of the profession, lifelong learning must be a necessity (*BMAS 3.2.1xi*). This was also a required competency in GbCF. CPD programmes should support professional development across all settings and all stages of a pharmacist's career, relevant to their work and responsibilities (*NS 6.11*) and should be tailored to meet national health needs (*PWDGs 9.2*). Clearly, CPD was meant to be a self-directed reflexive exercise in which the pharmacist identifies areas of improvement, gains knowledge and documents progress

(*GbCF 4.2.1*). This self-directed habit must be initiated at the student level for it to be carried on into practice (*NS 8.3, PWDGs 9.4*). A programme for CPD exists which has been discussed in chapter 4. However, this programme is neither self-directed nor introduced during student learning. It was only mentioned in the BMAS.

Leadership and Management skills as well as interprofessional interaction were recorded across all documents being recognized as invaluable competencies in practice. Leadership skills was the single standard unit with the highest frequency across composite coding frame documents. One of the objectives of the pharmacy programme was to produce graduates empowered with leadership and management skills (BMAS 1.2.2viii). This was in line with the global recommendation of preparing students to be future mentors, supervisors, preceptors and leaders by promoting a culture of peer support, knowledge sharing and student mentoring (NS 4.6). The PWDGS recommends the creation of programmes and strategies for leadership development including tools and mentoring systems (PWDGs 6.1). The human resource management competency (*GbCF 3.2*) as well as most management competencies (*GbCF 3.5, 3.6*) would require underpinning leadership skills (including self-leadership).

Communication skills was a global core competency and involved communicating clearly and precisely, tailoring communication to patients' needs (*GbCF4.1.4*), using lay terms and checking understanding (*GbCF 4.1.2*), demonstrating cultural awareness and sensitivity (*GbCF 4.1.3*). The ability to communicate effectively with patients and caregivers (*BMAS 1.2.2iv*), identify and solve drug related problems (*BMAS 1.2.2iii, 3.2.1iii*) were also objectives of the pharmacy programme. So was the ability to integrate seamlessly and confidently into a multidisciplinary healthcare team (BMAS 1.2.2v). Pharmacists must recognize the value of teamwork and of a multidisciplinary team (GbCF 3.2.5), participate, collaborate, give therapeutic advice and use appropriate referral (GbCF 3.2.3) while in the team. Interprofessional cohesion can begin from cross-disciplinary classes while in school (NS 2.7) and working with other healthcare professionals during experiential learning.

Table 6.5: Breakdown of domain 2 codes

S/N	Domains	Coding Units		BMAS	Notes
1	Professional Relevance	Broad Foundation Knowledge		1.2.2ii 1.2.2ii 1.2.2x, 3.2.1x **4 codes**	
2		Possession of Professional Competencies **(13)**	Consultation and Diagnosis	3.2.1vi **1 code**	
			Compounding and Packaging *****	3.14ai **1 code**	
			Dispensing	3.14, 3.1.6ii **2 codes**	
			Drug Synthesis and Analysis	3.1.4aiii **1 code**	
			Counselling and Medicines Information **	3.1.4avii, 3.1.4aviii **2 codes**	
			Medicines Management ***	3.1.4avi, 3.1.4aix, 3.2.1vi **3 codes**	Includes therapeutic monitoring, includes rational medicines use
			Drug Development and Manufacturing	1.2.2vii, 3.1.4av, 3.1.6vi **3 codes**	
			Quality Control and Assurance	3.1.4aiv **1 code**	
			Evidence Based Care	**Nil**	
			Professionalism, ethics and Professional Development, 3.2.1ix	1.2.2i, 1.2.2vi, 3.1.4b **3 codes**	Including patient confidentiality
			Rural and Community Pharmacy	3.1.6v **1 code**	
			Patient Safety	**Nil**	Including risk assessment and management
			Social Determinants of Health	**Nil**	

3		Possession of Transferable Competencies **(15)**	Communication Skills	1.2.2iv, 1.8f **2 codes**	
			Problem solving Skills	1.2.2iii, 3.2.1iii **2 codes**	
			Documentation Skills**	3.2.1vii **1 code**	Includes medicine errors and defects reporting
			Research Skills	3.1.6iv **1 code**	
			Reflexivity, Critical and analytical thinking	1.2.1, 1.2.2iii, 3.2.1viii **3 codes**	Includes proactive planning
			Policy and Implementation	**Nil**	
			Entrepreneurship, Finance and Business	1.8e **1 code**	
			Supply Chain Management	3.1.4aii **1 code**	
			ICT Skills	1.7.3, 1.8d **2 codes**	
			Interprofessional Interaction	1.2.2v **1 code**	
			Leadership and Management Skills	1.2.2viii **1 code**	Including self-management
			Collaboration and Teamwork	**Nil**	Includes knowledge sharing
			Prudence and Resource Efficiency	**Nil**	
			Cultural Intelligence	1.8c **1 code**	
			Citizenship and Patriotism	1.8a, 1.8b, 1.8c **3 codes**	
4		Applicability of Competencies		3.2.1ii **1 code**	
5		Specialization		**Nil**	
6		Research Intensity		**Nil**	
7		Professional Recognition and Role Specificity		**Nil**	
8		Continuing Professional Development and Lifelong Learning		1.2.1, 1.2.2ix, 3.2.1xi **3 codes**	Competency checks and professional recognition

Key- **-Developed from coding frame, *****- Added codes, Red- Modified codes, ***- Changed (From medicines assessment to medicines management) (From public-private partnership to stakeholder engagement)

6.4.2.3 Possession of Professional Competencies

Professional competencies refer to pharmacy-related knowledge, skills and attitudes that students must possess to function effectively or qualify as pharmacists. These are unique competencies that often differentiate pharmacists from other professionals (Haug, 1977). While certain core competencies are universal, many competencies may differ by country and are often determined by traditional roles performed by pharmacists within the country (FIP, 2017; Babar et al., 2013). Professionalism/ethical conduct was an important overarching competency which was expected to inform the application of other competencies. It was one of the competencies with the highest number of codes within this sub-unit. Others were medicines management, as well as drug development and manufacturing, each with three codes.

The PWDGs recommend the use of competency frameworks (*PWDGs 5.2*) describing competencies and behaviours expected of pharmacists. This has been done on a global level in the GbCF, where professional and ethical competencies include an awareness of national code of ethics (*GbCF 4.4.1*), maintenance of patient and health professional confidentiality (*GbCF 4.4.2*), recognising one's own professional limitations and taking responsibility for one's actions and for patient care, all the while seeking patients' consent (*GbCF 4.4.3*). A national competency framework is yet to be developed for pharmacy in Nigeria and could be a necessary consequence of this research. Global recommendations as well as findings from this research could yield a globally relevant yet locally applicable framework.

According to the BMAS, a sense of appreciation of the profession followed by an intellectually stimulating and satisfying experience of learning and study was expected *to "produce graduates who will function in a manner consistent with professional and ethical standards of practice in the country" (BMAS 1.2.2vi).* The aim of the pharmacy programme was to produce pharmacy graduates well-grounded in the law and ethics of the profession with a great sense of responsibility, respect for human life and self-esteem. The national code of ethics for the Nigerian pharmacists has been compiled and printed as a book, and thoroughly studied in the third professional year under the pharmacy jurisprudence or pharmacy/pharmacy ethics course which touches on patient confidentiality, consent and professional responsibility. Students must pass this course at 60% before graduating.

Programmes for professional development should also be established across all practice settings and through all stages of the pharmacists' career (*PWDGs 9.2*). This has been done in Nigeria with the establishment of the West African Postgraduate College. The Mandatory Continuing Professional Development (MCPD) exercise has also been designed by PCN to update the knowledge of pharmacists and enable them keep abreast of practice advancements and

modern trends in pharmacy, thereby enabling them to provide better pharmaceutical care.

Medicines management *(GbCF2.1-2.5)* was one of the other professional competencies highly coded within this domain. It included competencies such as rational use of drugs and therapeutic drug monitoring, impact and outcomes. The pharmaceutical care competencies outlined in the GbCF include medicines management behaviours such as the appropriate selection of medicines, formulation and concentration (*GbCF 2.1.1, 2.4.2*), ensuring appropriate medicines, route, time, dose, documentation, action, form and response for individual patients (*GbCF 2.4.3*), advising patients on proper storage conditions of the medicines (*GbCF 2.4.1*) and packaging to optimize safety. Identifying, prioritizing and acting upon all medicine interactions (*GbCF 2.1.2*) as well as medicines management problems which include errors (*GbCF 2.5.3*). These specific competencies are covered in the curriculum section of the analysis as part of pharmaceutics and pharmaceutical technology course components. The BMAS also specifies a few competencies that pharmacy graduates need to possess at the end of their study and these include monitoring of drug utilization by patients (*BMAS 3.1.4avi, BMAS 3.2.1vi*), guiding patients in the selection and use of non-prescription drugs (*BMAS 3.1.4aix*).

For a balanced programme, students should be taught both the pharmaceutical sciences and the use of medicines in patient care (NS 2.2) which is also seen in the curriculum section of the BMAS. Academic staff are required to add to the evidence that pharmacists can improve the responsible use of medicines and convey to students how to do this (*NS 1.6*).This evidence should be utilized during medicines management, applying guidelines, protocols, formulary systems and treatment pathways (*GbCF 2.5.1*) to optimize therapeutic outcomes. The NS document also emphasizes the importance of professional values and ethics to improving the responsible use of medicines (*NS 1.3*). Evidence-based care was one of the empty codes since it was not mentioned in the BMAS standards section.

The third highly coded competency was drug development and manufacturing. Local manufacturing was a major factor for development mentioned by stakeholders. As discussed in chapter 1, most medicines are imported rather than manufactured locally. Incidentally, none of the FIP documents contributed to this manufacturing standard unit in the coding frame. Likely due to differing pharmacists' roles from country to country. In Nigeria, drug manufacturing is predominantly undertaken by pharmacists, hence, the pharmacy curriculum prepares students for industrial practice. This was the reason for the “home grown” PharmD curriculum discussed in chapter 5 which still retained the rudiments and specifics of industrial practice despite it being a clinically focused curriculum.

One of the objectives of the BPharm degree programme is to provide students with adequate knowledge in manufacture, drug quality and distribution of quality pharmaceutical products (*BMAS 1.2.2vii*). Hence pilot drug production units were recommended for training students with a minimum exposure time of 30 hours (*BMAS 3.1.6vi*) per semester, in order to attain good-manufacturing practice and pre-qualification competency required for graduation (*BMAS 3.1.4av*). Findings from this analysis revealed that this was mentioned both in the academic standards section and curriculum section. In the BMAS a whole section (*BMAS 4.2.6*) was dedicated to specifying the equipment that should be available for training students in the pharmaceutical technology laboratory.

However, a gap in pharmacy graduates' industrial pharmacy knowledge and skills was widely discussed during the stakeholder group interviews. Employers reported that graduates were deficient in skills required for quality control and assurance, as well as working with industrial equipment. This was attributed to outdated equipment and facilities used to teach in schools, and educators' ignorance of current trends in industrial practice.

Patient safety and social determinants of health were also empty codes not expressly discussed in the BMAS. However, patient safety and focus were implied in both academic standards and curriculum, but social determinants was not found in the BMAS despite it being a recommendation for students learning (*NS 4.2*) and suggested as a way to promote health equity (*PWDGs 7.4*). This was likely the reason why only 35.4% of respondents either agreed that it was covered to a very great or great extent in the curriculum. The drug synthesis and analysis standard unit was also not covered by FIP documents but added to composite coding frame from stakeholder responses.

With a paradigm shift in practice from a medicine focus to a patient focus, clinical skills would be required to provide all-round pharmaceutical care to patients. Patient consultation and diagnosis was one of the recommended competencies by the GbCF. Expected behaviours included ability to apply first aid (*GbCF 2.6.1*) and appropriately refer or arrange follow up care, assess and diagnose based on objective and subjective measures, agree with patients best care options incorporating rational medicines use, document interventions made (*GbCF 2.6.5*) and update patient medical records accordingly.

Competencies such as clinical skills, consultation and diagnosis, counselling and medicines information were coded in the BMAS but not in a proportion as should be reflected by the paradigm shift. This was one of the reasons stakeholders gave for the PharmD switch. One of the objectives of the PharmD degree was to develop an ability to observe and analyse the symptomatology of various disease states (*BMAS 3.2.1vi*) by imparting to the students a comprehensive knowledge of pathophysiology and therapeutics

(*BMAS 3.2.1v*). Other required competencies documented include accessing information on drugs and providing this information to patients and other health professionals (*BMAS 3.1.4avii, viii*).

Compounding, packaging and dispensing of medicines were considered important competencies by the GbCF and were also coded for by the BMAS. The learning outcome for the BPharm degree was that "*a pharmacy graduate should be able to employ pharmaceutical knowledge and skills in the manufacture, distribution, and dispensing of quality medicines as well as ensure the rational use of drugs for optimum therapeutic outcomes in both human and animals*" (*BMAS 3.1.4*). The GbCF expects pharmacists to be able to prepare medicines under cGMP (current Good Manufacturing Practice) (*GbCF 2.2.1*), accurately interpret and dispense medicines and devices, monitor the dispense, report substandard drugs to appropriate authorities, document and act upon errors and maintain an error reporting system (*GbCF 2.3.6*).

Most professional competencies were adequately covered by the standards section of the BMAS. A few exceptions included, patient safety, which was implied in both standards and curriculum section in requirements and courses of study. Clinical skills to a better degree in the PharmD curriculum, hence the clamour for the switch. Evidence-based care, and social determinants of health were however not found in both standards and curriculum section. Transferable skills not extensively covered by the BMAS include policy and implementation, collaboration and teamwork as well as prudence and resource efficiency, which were all important themes given identified gaps and challenges. Collaboration would be necessary for interprofessional cohesion, resource efficiency to manage scarce resources in an LMIC and implementation which has been identified as a major barrier to progress.

6.4.2.4 Other Standard Coding Units

Other standard units within this domain include applicability of the competencies discussed above or outlined in the curriculum: it was pertinent for students to be able to apply the knowledge and skills acquired in school to the healthcare delivery systems in which they work as graduates. Inapplicability of these competencies was one of the descriptions of skill mix imbalance which has been a major theme in this thesis. The FIP documents acknowledged that science must be translated to practice across all settings and according to national needs (PWDGs 5.1). This application of classroom knowledge to practice should be taught in experiential settings by faculty members or volunteer preceptors with patients and other healthcare professionals present (NS 5.5). The Students Industrial Work Experience Scheme (SIWES) and Externship/Clerkship programmes in which students are exposed to relevant productive work in industries as well as community and

hospital pharmacies was established so students could acquire or consolidate transferable skills gained in a real-life working environment.

Empty codes for the BMAS included specialization, research intensity, professional recognition and role specificity. Role specificity was not found in all FIP documents but mentioned during stakeholder interviews hence added to the coding frame as a local requirement. This has also been discussed as a part of professional identity in chapter 4. Professional recognition was a major theme that cut across this thesis yet was neither mentioned nor implied in the BMAS. Opportunities for specialization within the pharmacy profession as mentioned in chapters 3 and 4 were not yet established in Nigeria.

In summary, the BMAS coverage for the professional relevance domain was 25 out of 34 codes (73%) which is good coverage. Within the standard units, for professional competencies the BMAS coverage was 10 out of 13 (77%), and for transferable competencies it was 12 out of 15 (80%). The BMAS acknowledged the importance of broad foundation knowledge and recorded most professional and transferrable competencies. Competencies not coded for included evidence-based care, patient safety, social determinants of health, policy and implementation, collaboration and teamwork, prudence and resource efficiency. Other standard units not coded include specialization, research intensity, professional recognition, and role specificity. These are all important considerations for a fit-for-purpose pharmacy programme.

6.4.3 Domain 3: Systems Efficiency

This domain describes the extent to which education outcomes can be maximized given available resources. Standard units within this domain include programme efficiency, academic productivity, stakeholder engagement, workable policies, process driven equity, and people driven equity. All units were coded once by the BMAS except workable policies which was not coded at all. Stakeholder engagement was the unit most recorded by FIP documents during formation of composite coding frame revealing the global importance of engaging with stakeholders on workforce development decisions which this study has attempted to do. This domain was not as well coded as previous two in the BMAS (see table 6.6).

Programme efficiency was largely determined by learning outcomes. In terms of success and experience of learners: pass rate, knowledge and skills acquisition, professional capability and integrity, as contributed by the programme (BMAS1.6.6vi). The exact way these are measured were not specified by the BMAS, neither were specific ways to maximize these outcomes given available resources clearly stated.

Both internal and external factors make for a fit-for-purpose pharmacy programme. Factors such as a well-paced programme, admission by merit, transparent quality assurance of the programme, a needs-based curriculum

(PWDGs 11.1), among others. It is also clear that no pharmacy programme can run effectively without adequate funding (NS 6.2) and infrastructure of good quality, an inspiring learning environment, sufficient educators as well as a curriculum that intellectually stimulates and satisfies students desire for study and at the same time meets societal healthcare needs (*PWDGs 7.1)*. These resources all have to be maximized to get the best education outcomes.

For example, the attrition rate of students could be attributed to a system inefficiency in recruitment. A high attrition rate in pharmacy school is in itself an inefficiency being a hindrance to academic productivity, having expended funds and expertise in training the students thus far. The BMAS document specified admission requirements for the pharmacy programme as credit passes in five subjects at O'level including English Language, Mathematics, Chemistry, Physics and Biology as well as an acceptable score in the Unified Tertiary Matriculation examinations or admission could also be granted through direct entry or interuniversity transfer mode *(BMAS 1.3)*. In all cases admission is by merit. This corresponds partly to the cluster of the Nanjing Statements on recruiting students which states that *"Students entering a school should have a strong scientific background, evidence of good academic performance and demonstrate good social and emotional skills" (NS 3.2).* However, social and emotional skills cannot be appropriately evaluated without oral examinations prior to admission which is currently not done in Nigeria. Research has shown that while some skills can be learnt others must be built on (Sorensen et al., 2009), and one cannot build on skills that are not present in the first place.

The BMAS document also indicated the study duration for both programmes *(BMAS 1.4)*. A 5- year study period for the BPharm and a 6-year study period for the PharmD. Each academic year is made up of two semesters with a minimum of 15 weeks of lectures/ practical sessions per semester. This seemed a well-paced programme, but, student and faculty members study participants complained about the workload and suggested more teaching weeks achieved through an independent academic calendar in both interviews and survey, similar to that which is done for medical students to enable a better pace which would foster retention of taught concepts.

The PWDGS recommends that education activities be systematically developed based on local health systems, their capacity and funding (PWDGs 5.1). Considering that poor academic capacity and funding were major barriers reported by stakeholders in the interview, clearly stating ways to efficiently run the programme given available resources may be useful for education leadership. The global standard is that financial resources should enable the objectives of education to be met (NS 6.2), and capacity building should focus on educator training *(PWDGs 1.3)*. Since this is not the case with

pharmacy workforce development in Nigeria, going by stakeholder responses, intervention may be required.

Recommendations include having specific metrics for measuring and monitoring education quality (*NS 7.2*). Having a quality improvement programme within each school or university which should demonstrate examples of specific improvement periodically (*NS 7.1*). Also, engaging with systems to measure the impact of the pharmacy workforce on health outcomes of patients (PWDGs 11.1) may give a clear picture of gaps that exist and how education could be better managed to deliver on national and global goals.

Academic productivity was another standard unit that would be required for an efficient system. A within-university academic audit could be useful to measure and ensure improved academic productivity. The PWDGs document recommends more attention to training and capacity building for clinical academic educators (*PWDGs 1.5*) which would improve their clinical teaching skills. Encouraging academic staff, students, preceptors and administrators to participate in national and international pharmacy related activities would also increase their exposure to more efficient ways of working. Finally, ensuring policies devised are enforceable and can be implemented to yield fit-for-purpose education.

Table 6.6: Breakdown of domain 3 codes

S/No	Domains	Coding Units	BMAS	Notes
1	Systems Efficiency	Programme Efficiency	1.6.6vi **1 code**	Includes cost efficiency and measuring outcomes
2		Academic Productivity	1.6.6viii **1 code**	Includes student recruitment
3		Stakeholder Engagement***	1.6.2, 1.6.6vii, 1.6.6ix, 1.6.6xi, **4 codes**	Includes public-private partnership collaborative decision making, Emphasis on Student input
4		Adequate Funding	**Nil**	
5		Workable Policies**	**Nil**	
6		Process Driven Equity	**Nil**	Including regulatory equity, curricular harmonization and national assessments
7		People Driven Equity	**Nil**	EDI, Inclusive policy development

Key **- Added codes

Stakeholder engagement was the requirement with the highest number of codes indicating that frequent reference was made to it in the BMAS document. The document specified that *"the views of employers and community members must be sought on the quality and relevance of the*

curriculum" (BMAS 1.6.6vii). Other practices such as student evaluation of courses, lectures and lecturers (BMAS 1.6.6x), feedback from graduates (*BMAS 1.6.6xi*), and involving external stakeholders in assuring quality of the pharmacy programme (*BMAS 1.6.2*) indicated that this was priority consideration. This was in contrast to what stakeholders reported in the interviews. As earlier stated, there was a perceived dissemblance between the education and practice sector which stakeholders expressed strong views about.

The design, implementation and global application of the documents used as coding materials all hinged on effective stakeholder engagement. It was acknowledged that planning at local and national levels must include stakeholders (*NS1.1*). The documents themselves specify stakeholder engagement as pertinent to ensure shared ownership for decisions made. Engaging with key stakeholders was described as a way to achieve sustainable solutions for capacity development (*PWDGs 1.4).*

Adequate funding was an empty standard unit not coded for by the BMAS despite it being the major barrier to education fitness-for-purpose reported by stakeholders in the qualitative phase. Funding of education in public universities is undertaken by the government and considering that these documents were written for education providers and providers of continuing professional development, funding would likely not be an appropriate domain. However, the systems cluster of the PWDGs which focuses on policy development, governmental strategy and planning, and monitoring systems mentioned funding briefly. This may be due to differences in context as earlier mentioned. The extent of the funding issue may not be equally experienced across all countries.

The negative consequences of inequity are extensively discussed in chapter 1. National equity described the extent to which the previously mentioned domains were fairly and impartially experienced by all schools across the country. This was an important domain going by stakeholder interview and survey responses. Particular references were made to geopolitical and age inequities. Geopolitical access inequities to higher education have been discussed in chapter 5. National equity can be fostered by both process-driven and person-driven methods.

The PWDGS document recommends knowledge of, and actions related to social determinants of health as a way to promote health equity (*PWDGs 7.4*) across the nation. Equal leadership opportunities, avoiding barriers to participation for all social categories, strategies and policies to promote gender and diversity balance across the workforce and career development opportunities for the empowerment of all without bias (*PWDGs 10.3*), are all ways to ensure process driven equity. Within the Nigerian context, regulatory equity, ensuring that fair effective and transparent policies and procedures

are set up for quality assurance of all pharmacy education across the country, inclusive of staff recruitment and student admission policies, age and gender diversity in leadership and equal opportunities for all, merit based reward systems, enacting policies that discourage favouritism and nepotism are specific examples of methods or techniques adopted to ensure equity. Equal access to resources would also foster equity.

People driven equity involved processes such as engaging with stakeholders and students in devising fair and effective policies for education and training (*PWDGs 3.4*). Involving both in planning and decision making, educating staff and students on equality diversity and inclusiveness to ensure that all equality domains are considered during education planning and implementation. Involving people in equity was quite important in Nigeria where policies and structures don't often work for leadership or governance.

The BMAS clearly states standards that would need to be met by all schools for accreditation to be granted *(BMAS 1.6.7- 1.7.4).* It also recommends that curriculum reviews must incorporate the opinions of all relevant stakeholders. These are the only sections that indirectly refer to equity within the entire BMAS, despite it being an important topic of discussion during the study. There were no direct references to process or person driven equity, neither was there any mention of the terms 'equity' or 'equality' within the entire BMAS despite this being a matter of national concern as reported by stakeholders in the study.

Summarily, a coverage of 43% (3 out of 7) in the systems efficiency domain by the BMAS is not ideal and should be urgently looked into.

6.5 Curriculum Section

The second section for the documentary analysis was the curriculum section. In this phase both the BPharm and PharmD were assessed to determine the extent of curricular coverage of professional skills outlined in the documents. In doing this, gaps and excesses were also identified. In this case, only the NS and GbCF documents were relevant for the coding frame in conjunction with stakeholder responses. This was because they outlined specific skills and competencies that were expected of pharmacy graduates. The PWDGs was a broader document touching on goals for workforce development, so it was not particularly relevant.

6.5.1 Coding Frame

There were 28 coding units in this section. Coding units came mainly from stakeholder responses. On crosschecking with FIP documents only two units needed to be added which were not mentioned by stakeholders, these were continuing professional development (CPD) and cross disciplinary learning; which are not exactly courses in themselves but need to be incorporated into students learning. All professional skills and recommended competencies in

the coding frame (made up of FIP documents and stakeholder responses) were covered by both BPharm and PharmD curriculum except dispensing as well as citizenship and culture for the PharmD and environmental health and sustainability as well as radiopharmaceuticals for the BPharm. Hence the curriculum met local and global requirements in terms of coverage.

6.5.2 Comparing the BPharm to the PharmD

The PharmD curriculum is the recently approved undergraduate programme which was recommended by the regulatory bodies as the minimum requirement for pharmacy qualification.

Despite the PharmD being of longer duration, table 6.7 below shows that less time is spent on the pharmaceutical sciences than in the BPharm. However, for clinical pharmacy, research methodology, biotechnology and public health pharmacy, the lecture and practical hours almost double for the PharmD. The hours column in the table reflect a combination of both lecture and practical hours. The clerkship hours multiply exponentially also from 90 hours in the BPharm to 675 hours in the PharmD. The PharmD also introduced new courses such as health psychology, nutrition, environmental health and sustainability, and radiopharmaceuticals to give students a stronger foundation in all-round patient-focused care.

Table 6.7: Breakdown of curriculum codes

S/N	Curriculum Coding Units	BPharm Curriculum	BPharm Hours	PharmD Curriculum	PharmD Hours
1.	Pharmaceutical and Medicinal Chemistry	2.2.1h, 2.2.1i, 2.2.1j, 2.3.1i, 2.3.1j, 2.4.1g, 2.4.1h, 2.5.1f, 2.5.1g, 2.5.1h **10 codes**	630	2.2.2i, 2.2.2j, 2.3.2f, 2.3.2g, 2.4.2i, 2.4.2j, 2.5.2j, 2.5.2k **8 codes**	555
2.	Pharmaceutical Microbiology	2.2.1m, 2.3.1e, 2.3.1f, 2.4.1f, 2.5.1e **5 codes**	330	2.2.2m, 2.3.2m, 2.5.2o **3 codes**	180
3.	Pharmaceutics and Pharmaceutical Technology	2.2.1k, 2.2.1l, 2.3.1c, 2.3.1d, 2.4.1c, 2.4.1d, 2.5.1c, 2.5.1d **8 codes**	570	2.2.2k, 2.2.2l, 2.3.2h, 2.3.2i, 2.3.2j, 2.4.2k, 2.4.2l, 2.5.2l, 2.6.1g **9 codes**	585
4.	Dispensing	2.4.1e **1 code**	135	**Nil**	-
5.	Pharmacognosy, Herbal and Alternative Medicine	2.2.1f, 2.2.1g, 2.3.1a, 2.3.1b, 2.4.1a, 2.4.1b, 2.5.1a, 2.5.1b **8 codes**	375	2.2.2h, 2.3.2e, 2.4.2g, 2.4.2h, 2.5.2i **5 codes**	330
6.	Pharmacology	2.3.1l, 2.3.1m, 2.3.1n, 2.3.1o, 2.4.1i, 2.4.1j, 2.5.1n **7 codes**	315	2.3.2k, 2.3.2l, 2.4.2m, 2.4.2n, 2.5.2m, 2.5.2n **6 codes**	270
7.	Clinical Pharmacy, social and administrative sciences regulatory sciences and ethical competence	2.3.1p, 2.4.1k, 2.4.1l, 2.5.1i **4 codes**	195	2.3.2a, 2.3.2b, 2.4.2b, 2.4.2c, 2.4.2d, 2.5.2b, 2.5.2d, 2.5.2e, 2.6.1d, 2.5.2g **10 codes**	360
8.	*Biostatistics and Research Methodology	2.3.1h, 2.5.1j, 2.5.1o **3 codes**	105	2.4.2o, 2.6.1e **2 codes**	300
9.	Biotechnology	2.4.1o **1 code**	75	2.4.2a, 2.5.2a, 2.5.2p, 2.6.1a **4 codes**	165
10.	Veterinary Pharmacy	2.4.1q **1 code**	45	2.5.2f **1 code**	60
11.	Public Health Pharmacy	2.5.1k **1 code**	30	2.6.1i **1 code**	45
12.	Pharmacoeconomics	2.3.1k **1 code**	30	2.5.2r **1 code**	15

13.	Language and communication	2.1.4j, 2.5.1j **2 codes**	60	2.1.4j, 2.4.2q **2 codes**	60
14.	Philosophy	2.1.4k **1 code**	30	2.1.4k **1 code**	30
15.	Citizenship and culture	2.2.1b **1 code**	30	**Nil**	-
16.	ICT Skills	2.1.4i, 2.1.4l, 2.2.1e, 2.4.1p **4 codes**	225	2.1.4i, 2.1.4l, 2.2.2g, 2.6.1h **4 codes**	195
17.	*Leadership and Management	2.2.1d, 2.4.1m, 2.5.1m **3 codes**	75	2.3.2c, 2.3.2n, 2.5.2q **3 codes**	90
18.	Professionalism, Ethics, Legal and Regulatory practice	2.1.4s, 2.4.1n **2 codes**	45	2.1.4s, 2.4.2p **2 codes**	45
19.	Entrepreneurship	2.2.1c, 2.3.1g **2 codes**	60	2.2.2f, 2.3.2d **2 codes**	45
20.	Basic sciences	2.1.4a, 2.1.4b, 2.1.4c, 2.1.4d, 2.1.4e, 2.1.4f, 2.1.4g, 2.1.4h, 2.1.4o, 2.1.4p, 2.1.4q, 2.1.4r **12 codes**	540	2.1.4a, 2.1.4b, 2.1.4c, 2.1.4d, 2.1.4e, 2.1.4f, 2.1.4g, 2.1.4h, 2.1.4o, 2.1.4p, 2.1.4q, 2.1.4r, 2.2.2e **13 codes**	615
21.	Basic Mathematics	2.1.4m, 2.1.4n **2 codes**	90	2.1.4m, 2.1.4n **2 codes**	90
22.	Basic Medical Sciences	2.2.1a, 2.2.1n, 2.2.1o, 2.2.1p, 2.3.1q, 2.3.1r **6 codes**	405	2.2.2a, 2.2.2b, 2.2.2c, 2.2.2d, 2.2.2n, 2.2.2o **6 codes**	345
23.	Clerkship	2.5.1l **1 code**	90	2.5.2c, 2.6.1b, 2.6.1c **3 codes**	675
24.	*Work Experience	2.3.1s, 2.4.1r **2 codes**	24 weeks	2.4.2r **1 code**	12 weeks
25.	Environmental Health and Sustainability	**Nil**	-	2.5.2d **1 code**	30
26.	Radiopharmaceuticals	**Nil**	-	2.6.1f **1 code**	30
27.	Cross disciplinary learning	**Nil**	-	**Nil**	-
28.	CPD	**Nil**	-	**Nil**	-

- *Modified

6.6 Discussion

This chapter attempted to determine local and global relevance of the pharmacy programmes in Nigeria, having identified domains for local compliance in previous chapters and following the publication of global standard documents for workforce development (FIP, 2012; FIP, 2016; FIP, 2017). The composite standards coding frame incorporated both local and

global quality recommendations which overlapped most of the time with some exceptions. The global standards did not cover specific units such as drug synthesis and analysis, drug development and manufacturing, citizenship and patriotism, role specificity, and curricular components such as biotechnology, veterinary pharmacy, public health pharmacy, philosophy, citizenship and culture, environmental health and sustainability, and radiopharmaceuticals. The local recommendations by stakeholders covered all units except prudence and resource efficiency and some curricular components such as radiopharmaceuticals, environmental health and sustainability as discussions did not involve that level of detail. This wide coverage of units from the study indicates that stakeholders are credible sources of information as stated in literature (WHO, 2006; WHO, 2008; UN, 2016; Jamshed et al., 2007; Ghilzai, 2008).

There was a good match between the BMAS and the standards section of the composite coding frame but a stronger agreement between the BMAS and the curricular section. The BMAS document was a 72% match (36 out of 50) on establishing clear standards for pharmacy training. However, it was a 86% match (24 out of 28) on curricular components. This may be due to the incorporation of several curricula from reference countries to attain similarity as previous reported by stakeholders, and which has also been reported in literature (Asiri, 2010; Jamshed et al., 2007; Duweijua et al., 2004). It also reveals that most necessary areas for local compliance are being covered by the curriculum.

The documentary analysis revealed that most global and local quality assurance requirements such as a formal accreditation system (FIP, 2014), stakeholder input in establishing standards (WHO, 2006), periodic curriculum review, and assessing competencies throughout the curriculum (FIP, 2017) were adequately covered by BMAS. However, stakeholder responses showed these standards were not upheld. With reports of accreditation standard discrepancies across schools leading to graduate of varying competence, overlooking stakeholder input at the final stage of curriculum development, ineffective and inconsistent assessment techniques, in the earlier interview and survey phases, there was a glaring mismatch between stakeholders' reports and BMAS standards, highlighting possible implementation challenges (Ukeje, 1986; Okoroma, 2006).

Other standards which were adequately coded for in the BMAS but failed at the implementation stage include an adequate number of qualified staff as well as the quality of teaching and learning materials used. This also covered opportunities for staff development as well as commitment to research and scholarship. The presence of demotivators such as poor remuneration (Roush et al., 2013), no formal arrangements for staff training and poor research support leading to little or no opportunities for national and international

collaboration (WHO, 2016), mean that staff numbers are not likely to increase significantly any time soon. Prohibitive government policies which do not encourage ongoing practice exposure result in staff struggling to keep abreast of advances in practice, hence out of date teaching materials and techniques (Adetunji, 2015). These altogether neither work well for staff development nor for students' needs-based education. These were tied to other issues such as outmoded pedagogies, an uninspiring learning environment, inappropriate assessments, as well as outmoded infrastructure which were quality barriers to accreditation success.

A similar pattern was observed in this chapter, standards covered by the BMAS were not implemented in practice going by stakeholder interview and survey responses, especially as discussed in chapter 3. Student support which was highlighted by students themselves in this study and another (Jee, Schafheutle and Noyce, 2013) as a major determining factor for success, was not coded by the BMAS. It was clearly not reckoned an important standard factor. In general, a coverage of 89% of the codes (8 out of 9) within the education capacity domain indicated that most of the standard units were recorded within BMAS. An even higher coverage rate could be achieved if more attention is paid to student and early career support while establishing standards.

Within the professional relevance domain (73% coverage), BMAS acknowledged the need for broad foundation knowledge and adequately covered transferrable competencies (80% coverage), which was slightly higher than coverage for professional competencies (77%). The high coverage for transferable competencies would be useful for pharmacists who would practice in future years. The World Economic Forum (2018) revealed that key skills within any profession required by 2022 would be transferable skills. Scholars argue that while scientific foundations are important, pharmacy programmes may need to increase focus on clinical and generic skills, including leadership, entrepreneurship and innovation (DiPiro, 2011; Keshishian and Brenton, 2011; Shaw et al., 2015).

Professionalism and ethical conduct being an overarching competency which will inform the application of all others was coded by BMAS. So were the medicines management competencies such as rational medicines management, therapeutic drug monitoring, storage, support in selection and use of medicines. Clinical competencies were also coded but not in the proportion expected give the paradigm shift in professional focus, hence the need and clamour for the PharmD switch. Transferable skills such as critical thinking, problem solving, communication skills, as well as lifelong learning were recorded as expected by BMAS though it was unclear how these would be achieved in the curriculum. The importance of opportunities for

application of competencies was also mentioned and work experience schemes (SIWES) set up to ensure this.

Specific units such as evidence-based care, social determinants of health, and patient safety were professional competencies not covered while policy and implementation, collaboration and teamwork, prudence and resource efficiency were transferable competencies not covered. Other standard units not covered by BMAS include specialization, research intensity, professional recognition and role specificity. Generally, a 73% (25 out of 34) coverage of the professional relevance domain by BMAS was good but could be improved upon if empty codes are addressed.

Measures for programme efficiency such as learning outcomes, pass rates, knowledge and skills acquired, professional capability and integrity were highlighted by BMAS but the exact way these are measured were not specified neither were specific ways to maximize these outcomes, given available resources.. Funding and management of financial resources, a major barrier discussed during the study, was not mentioned. While the BMAS was silent on these issues, several inefficiencies had threatened to overthrow the education system. Admission inefficiencies (Omeje et al., 2016) leading to high attrition rates (Huda and Agha, 2004), recruitment inefficiencies leading to inadequate number of poorly trained staff (Adetunji, 2015), financial inefficiencies (Ololube, 2016) leading to insufficient and outdated infrastructure (Roush et al., 2013) to mention a few . Global recommendations include having quality improvement programmes (FIP, 2017) within each school as well as specific metrics for the measurement of education quality and efficiency. Stakeholder engagement at all stages of education planning and decision making may minimize inefficiencies caused by communication gaps or ignorance. A focus on staff training and motivation may be useful to improve academic productivity. Both process and person driven equity were clearly global and local priorities as reflected by the coding frame (FIP, 2016; FIP, 2018). However, it was not coded at all in BMAS. Process and person driven techniques for ensuring equity have been recommended some of which include: ensuring fair and transparent quality assurance standards, promoting equity through actions related to social determinants of health, demonstrating strategies to address inequalities across the workforce, ensuring equal leadership opportunities (FIP, 2016), avoiding barriers to participation for all social categories, engaging and adopting policies and enforceable legislation for the promotion of equality, are some of the strategies for ensuring national equity. Empty codes here may be indicative of a lack of knowledge on equality and diversity issues or a deliberate attempt to exclude it from academic standards. Both cases would mean that the BMAS does not fully comply with local and global recommendations for a needs-based pharmacy programme. Summarily, a

BMAS coverage of 43% (3 out of 7) for the systems efficiency domain can be made better by implementing above mentioned interventions.

In the curriculum section, both BPharm and PharmD programmes met both local and global curricular requirements. Both with same 86% (24 out of 28) coverage were both satisfactory undergraduate pharmacy programmes for pharmacy students. However, research suggests that the PharmD must have a multidisciplinary curriculum to differentiate the pharmacist's role as provider of pharmaceutical care from that as simply drug dispenser (Hawboldt, 2017). Introducing CPD to students and ensuring they engage in cross disciplinary learning need to be considered. This would set the foundation required for lifelong learning and help them better understand the roles and functions of other health professionals and where they fit in within the health team.

Implementation is the most important step in national planning without which the benefits of useful standards and recommendations cannot be experienced (Ukeje, 1986). The discrepancies between the BMAS and stakeholders' lived experiences are indicative of implementation challenges. This implementation challenge has been identified by other studies in Nigeria (Okoroma, 2006; Adesina, 1977; Okeke et al., 1985) and has persisted for decades. Issues such as poor regulation (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008), corruption (Adesina, 2004; Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015) and a lack of political will and bureaucracy (Adetunji, 2014; Adetunji, 2015) have been identified as reasons for implementation challenges in many LMICs.

6.7 Conclusion

While this analysis has identified some gaps in the Nigerian pharmacy academic standards and curriculum and set the foundation for recommendations, a key finding was that the Nigerian pharmacy undergraduate curriculum coverage is mostly adequate. Curricular gaps would likely be caused by poor delivery and other implementation challenges and shallow course coverage which does not offer required depth to ground students in knowledge provided due to the overloaded curriculum, rather than poor curricular standards. The need for a national competency framework has been highlighted to establish the scope of knowledge and skills that are required to meet the health-related needs of the population.

While Scahill and Babar (2017) insist that due to globalization there exists a need for standardization of the disciplines that make up the pharmacy sector which should be reflected in the curricular content, there is little global consensus on this and the discipline still varies by country. This was therefore not an attempt to forcibly match the Nigerian curriculum to a globally recommended discipline which would go against the objectives of this study.

But a necessary step ensuring global compliance of a locally determined curriculum, towards the achievement of needs-based education.

Based on findings from this documentary analysis of basic minimum academic standards (BMAS) for the BPharm and PharmD, both programmes are suitable for the training of undergraduate pharmacists in Nigeria, barring few gaps. An appreciable number of standard and curricular units were coded but this was not reflected in earlier phases of the study due to implementation bottlenecks. Specific standards for workforce development in form of a national competency framework, as well as a focus on implementation barriers earlier identified in previous chapters, such as infrastructural upgrade, teacher training, are necessary for successful implementation. Once this is done, and identified curricular gaps are addressed within the current curriculum, graduates with desired levels of competency can be produced. Ultimately, implementation is the key to bridging the gap between the current status and fit-for-purpose workforce development.

7 Chapter 7: Final Discussion and Conclusion: Towards Needs-Based Workforce Development

This study was conducted in line with FIPEd's directive to optimize pharmacy workforce development by assessing needs and gaps and developing or adapting education accordingly (Anderson et al., 2009). It revealed the perspectives of a multisectoral sample of key pharmacy stakeholders in Nigeria on fit-for-purpose workforce development domains and compared the academic standards to both global and local requirements for fit for purpose training of pharmacists. This country case-study is useful for contextualization of the needs-based education concept, without which developing 'needs-based' education would be a mere theoretical pursuit. It has provided insight into how the needs-based phenomenon can be practically integrated into pre-existing traditional academic environments that may not have been previously aware or particularly welcoming to the approach (Anderson et al., 2012).

Three domains for fit-for-purpose pharmacy workforce development in Nigeria were inductively identified from stakeholders' responses: education capacity, professional relevance, and systems efficiency. Incidentally, these corresponded quite closely with the pharmaceutical workforce development goals (PWDGs) clusters: academy, professional development and systems (see table 7.1). Global recommendations for fit-for-purpose pharmacy workforce development focus on educational interventions, an enabling practice environment, as well as government systems and policies, similar to findings from this study. (FIP, 2016).

Table 7.1: Correspondence between findings and PWDGs

PWDGs Clusters	*Stakeholder Identified Domains*
Academy	Education Capacity
Professional Development	Professional Relevance
Systems	Systems Efficiency

An interrelationship among identified domains became obvious within this study, and progress in all three domains were interdependent (see figure 7.1). Clearly, the status of pharmacy education could not be isolated from the realities of practice in Nigeria which in turn was influenced by government systems and policies. This dynamic relationship between education, practice and regulation has been established by FIP (2014).

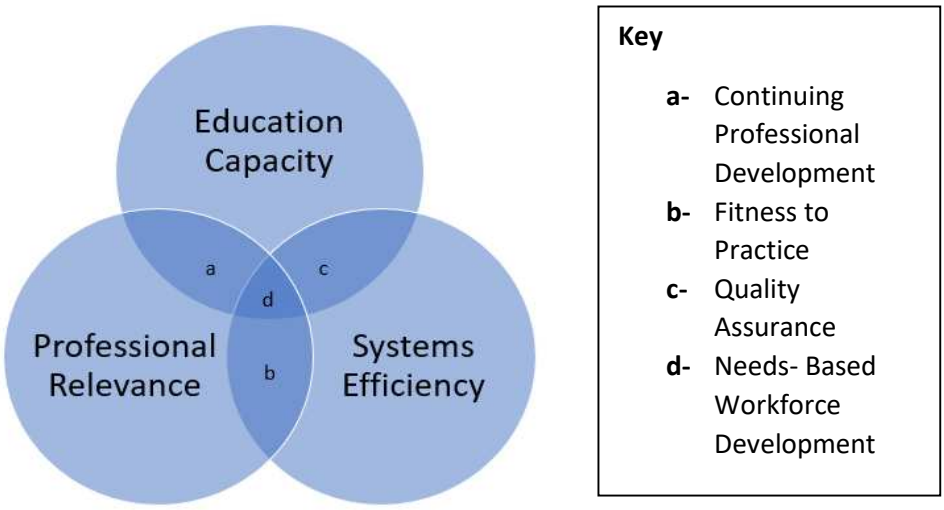

Figure 7.1: Interrelationship among three themes

In the same vein, the three themes discussed in this thesis must be equally considered in workforce development and national policy formation for the attainment of a fit-for-purpose pharmacy workforce.

This study identified key descriptors within each domain and has subsequently obtained stakeholder opinions on them, enabling an assessment of the status of pharmacy education and practice in the country from stakeholder responses. It has also evaluated the efficiency of the undergraduate programme (PharmD) change by reviewing potential barriers and facilitators, assessing benefits, and analysing the curriculum. In doing all this, this research has ultimately identified priority areas of focus for, as well as needs and gaps in, pharmacy workforce development within Nigeria which could be useful for education decision makers. Fox and Bennett (1998) said that identifying needs within a professional programme can lead to changes in behaviour towards the achievement of specific goals. This final chapter outlines these gaps identified, categorizes them, and discusses the major overarching needs as well as possible solutions and recommendations based on findings from this research and published literature.

7.1 Identified Needs

Workforce development reforms or change in pharmacy education is neither novel nor uncommon, but often in literature this is reported as a need for change rather than what needs to be changed. This study highlights needs and areas of focus for workforce development in Nigeria. In this research, needs were defined in terms of the gap between what exists and what is expected or required of pharmacists (Davis et al., 2008).

In other words: Needs = Required Services/Expected realities - Acquired Competencies/Existing norms.

It was important to highlight these needs since systems have limited ability to accurately self-assess their own needs (Davis et al., 2006). Assessing needs has to go beyond the literature to actually contextualizing issues to the present moment by obtaining stakeholder opinions so that development efforts are most relevant. Without such grounded methods and an assessment of practice and performance gaps, workforce development is unlikely to be effective.

Based on stakeholder responses, the following categories of needs were identified (figure 7.2) which if met would likely lead to a fit-for-purpose pharmacy programme. Several specific needs within these categories were also mentioned which informed item generation for the quantitative survey (table 7.2).

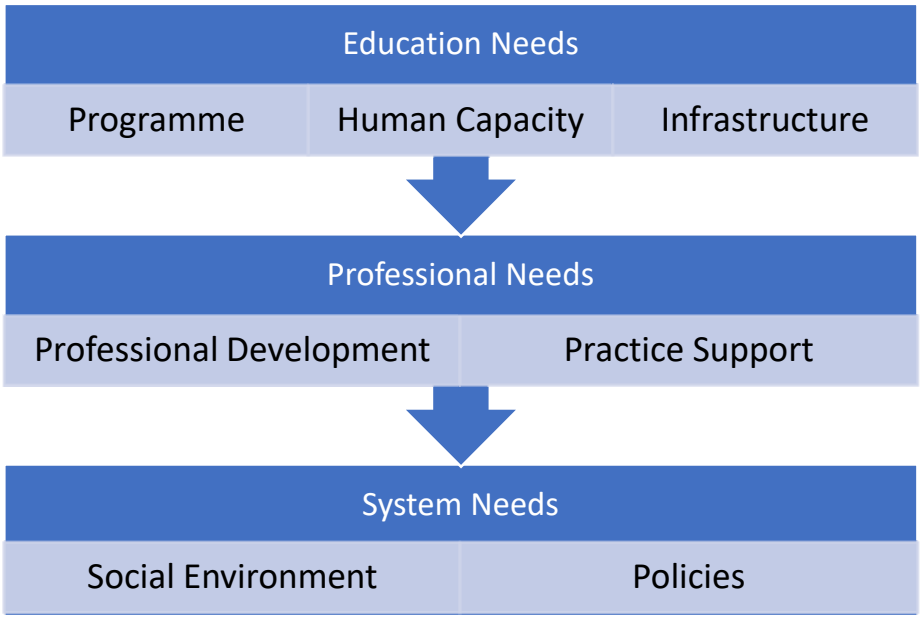

Figure 7.2: Categories of identified needs

Table 7.2: Identified needs

Education Needs	Professional Needs	System Needs
Patient Focused Curriculum	Role Specificity	Conducive and Inspiring Learning Environment
Course appropriate Pedagogies	Clear Professional Standards	Up to Date Infrastructure and Equipment
Adequate number of Qualified Teachers	CPD Support	Admission Management
Timely and Relevant Assessment	Interprofessional Cohesion	Uniform Curriculum for standardized graduate competence
Sufficient Experiential Learning Component	Clear Specialization Pathways	Employ Teacher Practitioners
Student Support and Mentoring	Professional Recognition	Rural Retention through Incentives
Succinct, patient focused, relevant and locally applicable Curriculum		Student Evaluation of Teaching
Experiential Learning		Evidence based decision making
Updated Teaching Materials		Sanitized drug distribution
Employing ICT in education		Independent Academic Calendar
Integrated Teaching		Cross disciplinary education
Increased clinical training		Leadership Diversity
		National Equity

7.1.1 Education Needs

This category of needs described factors required for pharmacy education to meet and maintain global and local standards. When any education reform is attempted, the curriculum is often the go-to for change. The International Pharmacy Federation describes curriculum reform as a priority area for urgent action in order to transform pharmacy education globally. It was not different

in this study; stakeholders thought the curriculum was an important fulcrum for quality education. When a fit-for purpose programme was discussed, what was often meant by "programme" was the curriculum. However, subsequent documentary analysis of the curriculum revealed a well-matched curriculum to both global and local standards. There were few gaps but likely not to the extent of a curriculum upgrade making a huge change. The major issue identified was therefore not the curriculum but contextualization and implementation of standards.

7.1.1.1 Globally Relevant yet Locally Applicable Programme

A globally relevant yet locally applicable programme was the major overarching education need that had to be met towards the achievement of fit-for-purpose pharmacy workforce development. This was a major finding from this study. This was also a part of the definition of 'needs-based' going by stakeholder responses.

Compliance with global standards is generally expected and standards for workforce development have been clearly outlined by FIP (2016, 2017), along with recommendations for within-context application of these standards. However, an 'off-the-shelf' adoption of degree programmes and curricular content from high income countries in a bid for global compliance has been reported by several studies (Jamshed et al., 2007; Babar, 2005; Hadi, 2010; Ryan et al., 2008), often leading to misalignment between education strategies and social need in LMICs. The PharmD switch, a major theme for this study, and a major topic of discussion within pharmacy education literature, has been reported to be one of such 'off-the-shelf' actions (Babar et al., 2013; Summers et al., 2001; Anderson and Futter, 2009; Deshpande, 2013; Jamshed et al., 2009; Jamshed, Babar and Masood, 2007; Babar et al., 2013; Okume et al., 2017). The notion of an international market for pharmacy education has also been discussed where pharmacists are trained specifically with the view to meet international employment standards solely for the purpose of ease of migration after studies (Babar et al, 2013; Matowe et al., 2004), in which case the local requirements and societal healthcare needs are not given priority. Education is therefore viewed as a tool for international employability (Jamshed et al., 2007, Anderson and Futter, 2009).This has been described as a complex issue that may have no immediate solution (Levy, 2003),

These narratives are all tied to the increased drive towards globalization discussed in chapter 1 (Lauder et al., 2006), which is really viewed as westernization by many LMICs (Lee, 2012). Global relevance is therefore actually perceived as western relevance, in which case, education in the global south aspires to attain these norms. The mindset that "western is better" has pervaded the education community in the global south without considerations for feasibility and suitability of these western standards. This

may be because most education development projects instituted by both local and international organizations have been guided by western standards (Rapley, 2004). Though there is some evidence to show that policy makers, pharmacy professional bodies and regulators in previous times did not view the development of pharmacy education in LMICs as significant, FIP, WHO and UNESCO now unanimously agree that the educational design and capacity to develop pharmacists for a diversity of settings across varying levels of service provision, competence, and scope of education must be quality driven and directed towards societal healthcare needs (Anderson et al., 2009). This must be so for the professional to remain relevant to the society requiring pharmaceutical services.

The question remains if LMICs are willing and still able to prepare graduates with the right knowledge and skills for the competitive global market and empower them to enhance knowledge exchange (Schwartzman, 2002) without leaning on these western standards that have so long been the epitome of education excellence. Especially considering that graduates from LMICs still aspire towards global relevance, and western standards in HICs may not be changed or relaxed on account of these changes. For example, with respect to the PharmD, Jamshed et al. (2007) reported that in some LMICs the undergraduate degree has been changed to a PharmD merely by extending the programme duration by one year with no content change. However, pharmacy foreign conversion exams in the USA now only accept pharmacists that graduated from a five year program (Ahmed and Ahmad Hassali, 2008). In this instance, the need for global mobility has made it necessary for there to be some form of uniformity in degrees and duration of training. This may have been the reason for the extension in program duration especially as there has been no recorded improvement in LMICs that have made the change to a PharmD (Babar et al., 2013).

This study also revealed that the programme change to a PharmD was not entirely a quality decision as most stakeholders thought the current BPharm programme was of expected quality but the change was made in a bid to better comply with global standards around a patient focused, collaborative practice, which feeds into the narrative discussed above. A programme change or upgrade in itself was a step in the right direction towards achieving needs-based education given identified gaps and barriers, as long as local relevance of the programme was not neglected according to above “globally relevant yet locally applicable” definition. However, local relevance may not have been considered as well as it should while making the PharmD switch, despite decision makers developing a ‘home-grown’ programme to cater to the needs of the country. This home-grown programme still focused on global content and standards. Stakeholder responses revealed that country specific healthcare needs were not prioritized when designing the curricula. Huge barriers that may likely cripple implementation success still existed and were

yet to be addressed. The focus of the homegrown PharmD was to ensure that all major areas of local practice were covered within the curriculum. However, the extent of coverage, relevance to current societal realities of each of these areas as well as the impact of already existent barriers may not have been prioritized, as stakeholders during focus groups still identified same gaps in the newly developed PharmD curriculum.

These findings were not surprising, as interviews with stakeholders in education leadership revealed a clear priority for education to meet global standards than fulfil local needs as graduates were assessed by their ability to excel at pharmacy conversion examinations in USA, UK or Canada specifically. It was clear from study findings in this research that stakeholders in education and regulatory leadership prioritized global compliance over local relevance and being members of the education decision making body it was no wonder the home-grown PharmD was still described as not locally-relevant by employers and stakeholders in practice. Stakeholders in education leadership were more likely to state that Nigerian pharmacy workforce development was globally compliant, while pharmacists in practice as well as employers were more likely to state that it was not locally relevant. Hence, a unified position on the status of pharmacy workforce development in Nigeria could only be obtained in the third phase when the collaborative consensual criterion of globally compliant-locally relevant was used to assess the pharmacy programmes. These polarized views may have hinted at a mismatch between the education and practice sectors of pharmacy and may very well be one of the major reasons for the mismatch between school-acquired and required skills for practice described by employers in this study. This skills mismatch has been identified in other LMICs and has led to a misalignment between education strategies and societal health needs (Jamshed et al., 2007; Babar, 2005; Hadi, 2010; Ryan et al., 2008). It also may be one of the reasons the pharmacy profession in Nigeria has not made monumental impact on the health system. This was a major motivation for this study, and a good number of stakeholders who were also employers decried the skills gap observed among pharmacy graduates due to this misalignment. There were also concerns that pharmacists may lose relevance in the labour market as other scientists were taking over jobs traditionally performed by pharmacists.

Stating that the main purpose of education was to prepare graduates for the labour market, stakeholders highlighted the need for education to be relevant to local practice. However, this study revealed that local requirements specified by regulatory authorities (NUC and PCN) are often not clearly outlined and even when they are, ineffective monitoring or quality assurance meant that they may be disregarded or fall through at the implementation stage.

Despite differing stakeholder opinions, there was consensus on the need to upgrade the programme by making it fit-for-purpose. This delicate balancing act of attaining both global compliance and local relevance is often not as easy to achieve in the LMIC context as this research and several previous studies reveal. While learning from other countries can be useful for education development, context differences must always be considered. For example, Belgian education policy makers have been reported to learn from France, Germany, and the Netherlands (Driesen et al., 2007) which are countries with similar context. In such cases, principles and concepts are usually safe to learn and apply, not so much methods and techniques, and adjustments should always be made for differences in context.

7.1.1.1.1 The Curriculum

In this study, an overloaded yet not entirely relevant curriculum was one of the gaps identified. This according to stakeholders was the result of constantly incorporating content and standards from several countries in a bid to attain global relevance. This was disapproved of by students and other stakeholders, and a move towards a succinct, more relevant, patient-focused, locally applicable curriculum recommended. There were reports of change fatigue caused by resulting frequent changes made to the curriculum. In contrast, studies have described curricula in LMICs as rigid, pedagogies static, hence change is so slow that it never catches up with the dynamic needs of the population served (Roush et al., 2013; Ghilzai, 2008; Johnson and Finucane, 2000; Frenk et al., 2010). This was not the case in this study, yet the needs of the population were still not met.

Other studies reported that issues that pharmacists have to handle in practice most often do not fit precisely into the disciplinary divisions used to design curricula (Cooke et al., 2010) which was similar to findings from this study as stakeholders stated that the pseudo British-American curriculum (Ikhile and Chijioke-Nwuache, 2016) which was currently run was not completely relevant to practice requirements despite being overloaded, having been influenced by traditional pharmaceutical sciences with limited application of knowledge to patient care (Shah et al., 2005).

Daugherty (2006) suggested the “inverted triangles” approach where the clinical sciences are taught from the beginning and become increasingly dominant and the basic sciences which are dominant at the beginning persist till the end, as well as curricular integration which involves viewing teaching as a holistic phenomenon (Cooke et al., 2010; Pearson and Hubball, 2012; Katajavuori et al., 2003). These methods are said to enhance theory-practice integration by providing a basis for the basic sciences in the initial clinical knowledge and a grounding for the clinical in the basic sciences. They are mandatory for lifelong learning and lead to the production of responsible experts prepared for the future. It has been suggested that the curriculum

should be designed in alignment with national priorities first and then regional and global needs in that order. This is important because without appropriately trained pharmacists whose skills match population needs, healthcare cannot be adequately provided. Especially considering that workforce quality and skill mix balance have been associated with improvement in health outcomes (Robinson and Wharrad, 2000; Anand and Barnighausen, 2004; Zurn et al., 2005).

Documentary analysis of both BPharm and PharmD academic standards revealed that documented standards and curricula were both globally compliant and locally relevant. A 72% standards match and 86% curricular match with a composite coding frame of local and global requirements was attained by the BMAS. An even higher match could be obtained if student and early career support, evidence-based care, social determinants of health, patient safety, policy and implementation, collaboration and teamwork, prudence and resource efficiency, specialization, research intensity, professional recognition and role specificity, adequate funding, workable policies, process and people driven equality are given more attention in the establishment of education standards. Curricular gap areas for the PharmD included dispensing as well as culture and citizenship, for the BPharm, Radiopharmaceuticals, Environmental health and sustainability, and for both programmes incorporating opportunities for cross disciplinary learning and introducing CPD to students whilst still in school.

This standards and curricular match were not reflected in stakeholder responses as earlier stated. Implementation in terms of curricular delivery, pedagogies, assessments, quality assurance to ensure standards are attained and maintained, seemed to be the major issue preventing stakeholders from experiencing the benefits of the curricula.

A theory-focused curriculum was also one of the gaps identified. Although pharmacy education has evolved overtime to a patient-focused, practice-based study, the successful incorporation of the experiential component has been difficult to achieve which was also the case in other LMICs (Collins et al., 1999). A lack of necessary equipment and infrastructural deficits meant that curricular import from HICs was done in a selective pattern with limited practical content and applications to patient care (Shah et al., 2005). Being a practice-based course, experiential learning, simulations and laboratory practical classes are necessary for a quality programme. Early exposure of students to clinical practice in real life settings promotes confidence and competence since they are able to apply classroom taught concepts in practice, learn from experienced professionals, and work in interdisciplinary teams (Littlewood et al., 2005; Dornan, 2005; Sturmberg, 2002). Generally, an understanding that the theoretical curriculum alone cannot furnish students with everything required for successful pharmacy practice (Jones et al., 2001),

should shift the emphasis from information overload to developing skills that foster lifelong learning to ensure continued relevance throughout practice and maintenance of required competencies.

7.1.1.1.2 Pedagogies and Assessments

Other gaps identified include static pedagogies which also included outdated lecture notes as well as unempirical and unsystematic assessment techniques. This study revealed that didactic teaching remained the major mode of curricula delivery in many pharmacy schools despite evidence which showed that acquisition and retention of information is tedious for both students and teachers (Johnson and Finucane, 1998). It also revealed that written assessments required students to reproduce lecture notes rather than apply taught concepts. Hence, more effective pedagogical techniques are suggested, which are proven to improve student engagement and retention by ensuring that learning is co-constructed by both educator and student. These include the flipped classroom model which involves active participation by students as knowledge co-creators (CTE, 2015), lecture capture (Marchand et al., 2014) which encourages on-the-go learning, or simulation and group work (Morrissey and Ball, 2016) which has been found to facilitate learning, improve students' confidence, communication and other social skills (Bridges, 2018), problem-based learning (PBL) which uses clinical cases as the context for students to study basic and clinical sciences, which may improve students analytical and critical thinking skills, as well as clinical reasoning, promote retention and application of knowledge, and encourage self-directed life-long learning (Johnson and Finucane, 1998). Following the seminal report of Frenk et al. (2010) there has been a move from problem-based learning to systems based instructional innovations to improve the performance of health systems by adapting core professional competencies to specific contexts, while drawing on global knowledge which this study has attempted. This should be the basis for strategies chosen.

With pharmacy being a health profession course, assessments should go beyond testing cognitive knowledge to assessing possession of required skills to practice independently. Current assessment techniques may not be suitable for measuring clinical and modern practice competencies. OSCEs have been recommended as the gold standard (Shirwaikar, 2015) with an ability to assess communication, problem solving, as well as clinical judgement skills. However, due to their perceived resource intensive nature, they are often not used in LMICs (Kalungia et al., 2019). In which case, resource-appropriate alternatives need to be developed which would effectively assess possession of required competencies throughout the curriculum as recommended (FIP, 2017).

While updating pedagogies and assessment methods may be useful to enhance students' engagement and knowledge retention, there should be

caution against pedagogies that do not translate to better pharmacy practice. The emphasis should not be on theory and principle but on outcome and consequence (Ormerod, 2006). In every case, selected strategies should be flexible to pre-existing and future needs of the community (Duncan-Hewitt, 2005) as well as consider available resources, concerns and priorities (FIP, 2013), in order to optimize effectiveness. There is no need for new problem-solving methods that do not actually solve problems.

7.1.1.1.3 Human Capacity

An adequate number of appropriately trained educators is also pertinent for quality education and was identified as a major gap in this study. Stakeholders stated that educator training was one of the most important descriptors for education capacity, and in their opinion the one most taken for granted, since there is no formal training for pharmacy educators. Once employed as a lecturer, you just begin to teach. Considering that government policies in Nigeria prohibit lecturers from practicing pharmacy at the same time, the lack of teacher training is often made worse by a lack of practice exposure in one's chosen area of specialty. Meanwhile, research has shown that teacher qualification is a greater predictor of student attainment than race, social class and previous education of the student combined (Clotfelter, Ladd and Vigdor, 2008).

Faculty shortage (FIP, 2009), poor training of available educators (Rigoli and Dussault, 2003; Anderson and Futter, 2009; Dayrit and Dolea, 2006) or some form of workforce challenge is experienced in all countries (Narasimhan et al., 2004), but in the LMIC context several issues combine to make this a workforce crisis (Chen et al., 2004). Many studies link the progress status within any sector to adequate workforce numbers and appropriate training (Anand and Bärnighausen, 2004; Bossert et al., 2007). Workforce issues have been identified as the one of the biggest challenges to the attainment of global goals (FIP, 2012), and Chapter 1 discusses efforts that have been made by global leadership bodies to mitigate this issue. National decision makers should tackle this challenge with same priority and commitment to ensure achievement of education goals. Investment in capacity building for educators is critical for the preparation of a health workforce capable of providing high quality patient centred care, and unresolved workforce issues do not only affect the overall system but may also negatively impact the feasibility and sustainability of reforms (Fritzen, 2007).

Students support was another major need identified in this study. Students did not feel well supported in pharmacy schools. There was a sense that the system was against them rather than supporting them in their learning. Support could be in terms of academic course advisers providing guidance and counsel to students or non-academic mentors; pharmacists who have excelled in various areas of practice providing insights on practice realities (Jee,

Schafheutle and Noyce, 2013). Ultimately, student support begins by ensuring the right kind of students are admitted into the programme. While some skills can be taught in school certain desirable traits must be already present for a student to make a good pharmacist (Sorensen et al., 2009). These required traits should be prioritized during student recruitment.

7.1.1.1.4 Infrastructure

Infrastructure quality was discussed extensively this was a major need reported by participants in education leadership and served as a deterrent to research progress. This is also not a peculiar challenge, as a study conducted on 120 countries around the world found that about 70 countries had grossly inadequate infrastructure (WHO, 2005). It is also a common educational challenge in several LMICs (Matowe et al., 2004; Fathelrahman et al., 2016) and has been attributed to lack of funds, corruption and embezzlement of available funds (Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015; Ololube, 2016), and a lack of political will to improve infrastructure. Stakeholders, especially those in the industrial sector, believed that this was the major cause of pharmacy graduates' poor competence in industrial pharmacy knowledge. Equipment and facilities for student learning were outdated and not available in adequate quantity for quality education.

Being a widespread issue, solutions posed include taking advantage of instituted aid such as programmes that offer volume discounts or free access (Aronson, 2004). It may also be worthwhile to build partnerships with industries that already possess state of the art equipment within the country and establish routines for student learning. Industrial experts are more than willing to collaborate with schools to train students thoroughly, considering that they employ these students and would bear the brunt of ill-prepared graduates.

Generally, findings revealed that education capacity was a very important domain for ensuring fit-for-purpose pharmacy workforce development. Global standards specified in FIP documents (FIP, 2012; FIP, 2017; FIP, 2018), as well as local requirements established by stakeholders need to be taken into account while addressing gaps identified to ensure that needs-based workforce development objectives are achieved. This must be done to avoid a resulting superficial, unsuitable programme, in which case graduates may become a burden to the healthcare system and society (Hadi, 2014).

7.1.2 Professional Needs

This category of needs described gaps relating to professionalism and practice that had to be addressed to ensure maintenance of competency and continued relevance to the health system. The extent to which pharmacists felt that they contributed or were perceived by the public or other health professionals to contribute, or actually contributed to patient care largely influenced their sense of professional relevance and identity. This was a major

finding and as a result, barriers to an enabling environment for practice or professional development were viewed as impediments to the recognition and progress of the pharmacy profession. An understanding of the history of the pharmacy profession briefly discussed in chapter 4 may shed some light on the reasons for this.

7.1.2.1 Professional Recognition within an Enabling Environment

This was the major overarching need within this category. The need for professional recognition in the face of marginalization has been the bane of the pharmacy profession for many years (Knapp and Knapp, 1968; Shuval and Gilbert, 1978; Babar et al., 2013). The lack of recognition of the clinical role of pharmacists despite 'reprofessionalization' in the LMIC context is widely documented (Ahmed and Hassali, 2008; Jamshed and Babar, 2009; Mangasuli et al., 2008; Ablsoule-Younes et al., 2008), and this meant pharmacists felt underutilized and unrecognized for the skills they possessed (Gilbert, 1998; Auta et al., 2014). In these contexts, there are often no clear-cut pharmacists' roles, but roles are largely defined by public recognition, other healthcare professionals, and the government (Babar, 2007; Khan, 2009; Lim et al., 2012).

This role ambiguity and lack of recognition is not solely an LMIC phenomenon it is globally acknowledged that the pharmacy profession faces a challenge with respect to contributing to patient care and improving practice (Tsuyuki and Schindel, 2008). In contrast to several other health professions, the roles of pharmacists vary from one region to another and even within countries there are huge differences (Gilbert, 2001). In some cases, the singular role of dispensing with the accompanying monetary proceedings is what being a pharmacist entails. In such cases, pharmacists often go unrecognized as healthcare professionals and are not making visible contributions to national healthcare (Babar et al., 2013). In yet others, the move for role redefinition has been successful and pharmacists find themselves taking on increasingly significant clinical roles and offering direct patient care which often leads to conflicts with other members of the health team (Babar et al., 2013).

As a result, there have been debates in literature as to whether or not pharmacists' roles should be defined, and what these roles are anyway (Cavaco et al., 2005). It should be understood that there would be consequences whichever way the decision goes. A decision not to define may mean widely varying societal perceptions, weak conceptualizations leading to low expectation as is the case in many LMICs (Bisell and Morgal-Traulsen, 2005; Sutters and Nathan, 1993; Gilbert, 1998). While a decision to define may streamline practice opportunities and exclude pharmacists working non-traditional jobs.

In the Nigerian context, stakeholder's unanimously (97.9%) agreed that clearly set out standards, and pharmacists' roles, would facilitate a fit-for-purpose pharmacy programme. Based on stakeholder responses, ill-defined

pharmacists' roles had greatly contributed to professional relevance issues, and a lack of recognition. Stakeholders suggested that if pharmacists' roles were clearly defined by government health policies, education could focus on providing pharmacy graduates with the skills required to function optimally in those roles.

Clearly defining who pharmacists are and what they are expected to do in every context may be necessary, as this is the "purpose" without which fit-for-purpose education would be impossible, which may be a major reason why this has been difficult to attain. Poorly defined professional role boundaries can also become a source of conflict as has been discussed in chapter 4 with medical doctors, and reported by several other studies (Tahaineh et al., 2009; Islam et al., 2014; Lalonde et al., 2011; Ables and Baughman, 2002; Matowe et al., 2006; Bryant et al., 2009). There is a risk that the best interests of patients and the public are not served as a result of this. This should be undertaken with the understanding that while it is the pharmacists' right and obligation to conceive, develop, and advocate new, different or expanded pharmacy services, it is neither their function nor right to force these on the public. Societal needs, affordability and several other social dynamics will ultimately determine the roles required.

An enabling practice environment in terms of favourable and enforceable government policies, effective regulation of the profession, as well as opportunities for professional development were also discussed, and these determined how effective pharmacists were at achieving professional goals (Hirschi, 2012). Issues such as a chaotic drug distribution system (Awaisu, Mohammed and Yakubu, 2016) which made it possible for charlatans and non-professionals to handle medicines, and led to over-the counter sale of prescription medicines (Oseni, 2019) and subsequent incidents of drug misuse and abuse, poor regulation and a failure to enforce policies (Erhun et al., 2001), poor remuneration, interprofessional conflicts among others were mentioned, and these led to a feeling of dissatisfaction and disillusionment with the profession.

7.1.2.1.1 Professional Development

It has been reported that graduates are being trained for jobs that do not yet exist (WEF, 2018). This singular piece of information makes continuing professional development, and lifelong learning priority skills that must be emphasized in undergraduate education. Change agility- the ability to learn and unlearn may be an important way to guarantee continued professional relevance following the increasing acceptance that the undergraduate programme cannot teach a pharmacist everything necessary (Jones et al., 2001). Especially considering the rapid growth and rate of change of knowledge and workplace dynamics. To keep abreast of current trends and latest advancement in pharmacy practice, continuous professional

development has been globally recommended for all practicing pharmacists (FIP, 2016), and self-directed lifelong learning is a skill that must be embraced by all pharmacists (WHO, 2006).

Insufficient or total lack of opportunities for training and professional development were reported in the qualitative phase of this study, especially among academics who are expected to train pharmacists of the future. Consideration should be given to training and development opportunities for pharmacists in practice. Strategies to increase CPD support and participation need to be considered, such as ensuring that it is mandatory by making it a registration prerequisite. FIP also recommends that CPD should be self-directed and introduced to students while in school to improve awareness and compliance (FIP, 2017).

Stakeholders emphasized a need for post-graduation specialization. They explained that this was the only way to attain expertise in any chosen field. However, there are no clear-cut pathways for specialization within the pharmacy profession nor specialist pharmacists to facilitate same in Nigeria. Participants in group interviews referred to pharmacists as “jack of all trades and master of none” considering the broad foundation knowledge acquired to enable cross-sector practice relevance as previously discussed.

Availability of specialization pathways lead to higher levels of satisfaction among health personnel (Krugman, Smith and Goode, 2000), greater opportunities for professional development (Ward and Goodrich, 2007), as well as increased diversity (Dodgson et al., 1998). While there are post graduate programmes that provide specialist areas for training, these are often not recognized. There is the West African Postgraduate College of Pharmacists: an arm of the West African Health Community (WAHC), which has areas of specialization in production and quality control, clinical pharmacy and public health. Residency programmes have been introduced and fellowship certificates issued by the college, which have been recognized for appointment into the consultancy grade of the civil service (Bashir A, 2002), but this is yet to be implemented.

These government instituted post-graduate programmes would need to be recognized and policies put in place for appropriate employment and remuneration in line with specialist training. These policies would include a shared understanding and definition of the terms ‘specialization’ and ‘advanced practice’, quality assured mechanisms to assess the competency and capabilities of expert or specialist pharmacists within all sectors, as well as recognition systems which can serve as markers for advancement. FIP encourages recognised advancement of the pharmaceutical workforce as a basis for enhancing patient care and health system deliverables (FIP, 2016).

7.1.2.1.2 Practice Support

There was a constant reference to an enabling practice environment as being a major need. This was defined by effective regulation, favourable policies, interprofessional collaboration, among others. Pharmacists especially those in clinical practice often felt unsupported in the work environment. The major gap highlighted was a lack of collaboration especially from medical doctors. This was a frequently occurring topic of discussion, with a trend towards collaborative practice being one of the key reasons for the PharmD switch.

The ability to understand and respect the unique contribution of colleagues and possess the skills to work effectively with them to obtain the best outcomes (Gilbert et al., 2000) is what collaborative practice entails. The complexity of diseases, increasing sophistication of therapies, and accompanying technologies support the need for collaborative practice (Reeves et al., 2013), and the benefits of collaborative practice among health professionals in clinical settings have been reported by several studies (Mickan, 2005; Greiner and Knebel, 2003; Frenk et al., 2010). Yet subtle and overt interprofessional role conflicts between medical doctors and pharmacists (Babar et al., 2013; Hassali et al., 2013; Islam et al., 2014; Scahill, Harrison and Sheridan, 2009; Lalonde et al., 2011) are well-documented.

There is a general understanding that quality patient care depends on a wide range of health professionals working together, since no single profession can deliver the full range of health services needed. Hence, health professionals should engage in collaborative partnerships to ensure the best healthcare provision for the patient. Efficient health systems also need to make the necessary transition to team-based healthcare and collaborative practice.

Other support mechanisms suggested include effective regulation of the profession. Similar poor regulation and other regulatory issues have been reported in other LMICs (Ahmed and Hassali, 2008; Jamshed et al., 2007; Ghilzai, 2008; Ghilzai and Dutta, 2007; Mangasuli et al.,2008). Stakeholders in this study described pharmacy as the “most encroached profession”. This was the case because regulations were neither adhered to nor enforced.

7.1.3 System Needs

This category of needs described system issues that had to be attended to for needs-based workforce development. These were mostly related to social environment and government policy. It quickly became clear as research progressed that pharmacy workforce development could not exist in isolation of these system issues, and most issues identified bordered around resource inefficiencies and inequities in distribution.

7.1.3.1 Efficient and Equitable Resource Management

This was the overarching need within this category. Efficiency and equity are useful in any given system. However, considering the income group of the country and the scarcity of required resources reported by stakeholders, there was an even greater need for both. In this study, efficiency referred to the extent to which outcomes could be maximized given available resources, while equity referred to the extent to which all above mentioned domains could be equally experienced across the country. Frequent references to inefficiencies such as corruption, embezzlement and misappropriation of funds, poor maintenance of available infrastructure among others as well as inequities such as tribalism and geopolitical favouritism indicated the importance of these domains. Fit-for-purpose workforce development would therefore involve identifying concerns and priorities and coordinating appropriate supports through an efficient use of resources, while promoting national equity. Given the multi-ethnic and multi-cultural country context, it was important to develop the intellectual capacity to understand, appreciate and promote peaceful co-existence through equitable resource allocation.

7.1.3.1.1 Funding

Inefficient funding and management is a common challenge in the LMIC context (Roush et al, 2013; Babar et al., 2013), and was one of the major barriers identified in this study. Inadequate funding had negatively impacted pharmacy workforce development in many ways. Several other gaps identified such as poor infrastructure, poor staff remuneration were tied to funding. With public universities largely dependent on meagre government funding, less money was available per student for quality training and education (Gazzola and Didriksson, 2008). For example, budgetary allocations to education for 2003, 2004 and 2005 financial years were 7%, 12% and 11% respectively and by 2019 it was back to 7%. This is far from the UNESCO recommendation of 15-20% minimum budgetary allocation (UNESCO, 2000; Hinchcliffe, 2002). Lack of funds for research was also discussed as evidenced by Nigeria having one of the lowest official development and assistance to medical research and basic health sector per capita (WHO, 2017).

Corruption which cuts across several descriptors was identified as a major reason for these indices (Adesina, 2004; Aluko, 2002; Bamidele et al., 2016; Adelekan, 2012; Ijewereme, 2015) and needs to be addressed to ensure progress within the education sector. A lack of political will to improve the education sector is indicated by the poor budgetary allocation to education, as well as embezzlement of funds for education (Ololube, 2016). Lessons learnt from China and India, both economically reliant on the west previously but moving towards future global impact, show it is necessary to maximize the use of scarce resources in order to record desired progress. A starting

point for this could be proper planning and monitoring (Ukeje, 1986) of education funds, as well as appropriate penalties meted out to offenders (Erhun, Babalola and Erhun, 2001). Also, without improvement in government budgetary allocation to education only so much can be achieved.

7.1.3.1.2 Programme Efficiency

Programme efficiency was mainly discussed in terms of the efficiency of the PharmD switch. Some participants suggested running BPharm and PharmD concurrently so students could have a choice, others thought this was inefficient. Stakeholders stated that it was important to ensure that any programme being run considers available resources and makes best use of them. Some stakeholders had doubts concerning the efficiency of the PharmD switch. Efficiency was discussed with respect to the need for the PharmD in the first place. Given the challenges of the current BPharm programme that had not been addressed such as lack of funding, workforce shortage and expertise deficiencies, there were doubts as to whether the PharmD program would be of acceptable quality with these issues still existing. Similar doubts have been expressed in literature (Anderson and Futter, 2009; Jamshed et al., 2007). Hence, ensuring valid motivation for the PharmD switch was necessary to ensure efficiency. Stakeholders stated that pharmacists increasing clinical role within the country (which the BPharm did not adequately prepare them for) was the main reason for the PharmD switch. Increasing clinical and patient focused roles have been reported (Anderson, 2005; Peterson and Kelly, 2004; Niquille et al., 2010). Having established the need for a patient focused programme, ensuring that resources are available, forecasting potential barriers, as well as leveraging on identified facilitators were viewed as an efficient way to proceed. This study attempted to do this and identified barriers include poor clinical training capacity, the education-practice gap earlier discussed, perceived detriment to other areas of practice which reflected a poor understanding of the 'home grown' PharmD, medical doctors' resistance among others. Implementation facilitators include foreign collaboration for clinical training of educators and preceptors, students' interest, home grown curriculum and the doctor title. Addressing barriers and leveraging on facilitators maybe an efficient way to proceed with the switch.

Cost-efficiency was also considered, with the PharmD programme being a more resource-intensive programme than the BPharm, stakeholders thought PharmD graduates were not likely to justify the extra cost spent on the course by making more money postgraduation than BPharm graduates for many reasons such as the non-recognition of the PharmD practice cadre by the government, unavailability of clinical pharmacist roles in hospitals, unlikelihood of patients to pay more for PharmD pharmacist services in

community pharmacies. Despite stakeholders' personal experience, they stated that they could not distinguish between PharmD and BPharm graduates.

7.1.3.1.3 Useful Policies

Other measures of efficiency mostly involved enacting useful policies to maximize available resources. Participants continually referred to weak policies preventing pharmacists from exploring the full breadth of their professional capacity as healthcare providers. Policies related to government spend were reported to be responsible for funding issues, several other system issues such as poor and delayed staff remuneration, unavailability of teacher practitioners, inability of faculty members to have practice exposure, access to patients for student learning as well as several other issues earlier discussed were due to weak, ineffective or unenforced policies. According to academics, productivity was greatly hampered by several factors such as the current 15 weeks per semester (similar to courses in the arts) which was insufficient to cover the syllabus, leading to increased workload and pressure due to staff shortages and resulting inefficient teaching methods. Most survey respondents agreed that high work pressure, due to heavy workload, made worse by workforce shortage had negatively impacted educators' productivity. Policies permitting an independent academic calendar similar to that which is run in medical schools may be valuable in this regard. The majority of stakeholders agreed to this proposition to effectively cover the course load of the undergraduate degree.

Other policies promoting programme efficiency were deliberated upon such as collaborative learning through interprofessional education. Given the shortage of academic staff, courses that were common to students of other disciplines could be merged, while this may be an efficient way to teach these courses it also provides an opportunity for students from various health professions to forge working relationships which may improve inter-professional relationships in practice (Buring et al., 2009).

Integrated teaching was also mentioned by academics who had heard about it in conferences. This they said would make for better understanding as the students would appreciate the interrelation of the pharmacy sub-disciplines.

Partnerships and collaboration between education and the practice sector was also discussed as an efficient way to ensure teaching excellence and improved research output. Combining practice experience and availability of required equipment of the practice sector with research skills and academic insight of education institutions could prove a mutually beneficial partnership experience. Almost all survey respondents agreed that a strong partnership

between pharmacy schools and the public/private sector is foundational for the achievement of a needs-based pharmacy programme.

Evidence is useful for planning and forecasting, but poor research output for evidence-based decision making has been a major constraint to the achievement of fit-for-purpose education in many LMICs (WHO, 2011). Understanding that research is critical for evidence-based policy and practice and for tracking and monitoring purposes (Riley et al., 2012), support and grants for research should also be prioritized in education planning and budgeting. Existing sources for data also need to be maximally utilized in decision making (Gupta et al., 2003), as well as adopting what has worked in similar contexts (Driesen et al., 2007). Almost all surveyed agreed that evidence-based findings should inform context specific, collaborative decision making in pharmacy education and practice. This should begin by prioritizing research and evidence within the country, which may be difficult considering the unavailability of funds for research.

7.1.3.1.4 National Equity

Stakeholders explained that it was important for previously mentioned domains to be equitably experienced across the country. Following from discussions with employers, where they highlighted wide variations in graduate competence across different pharmacy schools, participants thought this ought not to be so. Equity has become a global hot topic due to social and political occurrences in many countries and should also be prioritized within the workforce development context (FIP, 2016).

Based on interview responses, issues such as tribalism and geopolitical favouritism (Aleyomi, 2013; Okolo and Okiemute, 2014) had led to some of the national inequities identified. Stakeholders identified this as a huge problem where decisions were not made objectively. Stakeholders suggested that the quest for equity should be process driven as this may not automatically work itself out. Suggestions include outreach to those who may not consider health professions an option (Ara, 2004), specialized programmes for underrepresented students (Fincher et al., 2002) and expanding selection criteria to accommodate those with special attributes that make them suitable candidates for pharmacy study (Howe et al., 2004). A conscious effort toward diversity and equality in processes such as student admissions, staff recruitment, work placements and leadership selection should be made.

One of the strategies suggested for addressing geographical maldistribution of pharmacists was providing incentives to students who school in rural or semi-rural areas to remain there for practice afterwards, as this may address the large disparity between access to healthcare in rural and urban areas (Taylor

and Harding, 2001; Smith, 2001; Roush et al., 2013). A majority of those surveyed agreed or strongly agreed to this suggestion.

Ensuring that standards set by both global and local regulatory bodies are both upheld and maintained would determine if a needs-based programme can be actualized in the Nigerian context. With an emphasis on the maintenance of standards. A big theme during stakeholder interviews was a poor maintenance culture of any sort. Reports were made of initiatives that had a good start but this could not be sustained. Sustainability should be the key when setting and accepting quality standards. Transparency and implementation equality were also factors to be considered when setting accreditation standards (FIP, 206; FIP, 2017). Participants stated that it was important for standards to be fairly and equitably applied to all pharmacy schools, this, as well as ensuring that the harmonized curriculum is implemented in each school may promote some measure of national equity.

National Assessments were another quality measure for ensuring equity. The pharmacist council of Nigeria (PCN) had recently introduced a preregistration examination after internship to ensure pharmacy graduates are fit for practice. Most survey respondents agreed that the recently introduced pre-registration examinations was a good way to standardize graduate competence across schools.

Other equity domains such as gender equity and age diversity in leadership were not discussed during the focus groups but responses from the survey showed that most either agreed or were neutral to the statement that an age diverse education leadership would make better decisions than a gerontocratic one.

Finally, policies to ensure that resources are efficiently and equitably allocated and standards applied, should be enacted. A study carried out to evaluate pharmacy practice policies in Nigeria (Oseni, 2019) revealed that existing policies were inadequate to regulate the practice of the pharmacy profession in Nigeria. The implementation of these policies should also be prioritized as research has shown that policy implementation has been (Okoroma, 2006) and still remains a major challenge in Nigeria.

7.2 Study Strengths and Limitations

This study employs an inclusive and innovative approach to evaluating workforce development. No study of same scope and scale has been carried out in the Nigerian pharmacy context. Others discussing workforce development of pharmacy education or the PharmD switch in the LMIC context on a national scale have mostly been narratives. This study should move conversations from anecdotal to empirical and serve as a foundation for evidence-based policy making and future planning.

This research has four major strengths;

- This is the most comprehensive and inclusive overview of pharmacists' opinions on workforce development in Nigeria leading to an identification of priority areas of focus for likely progress.
- This is the first study to assess and analyse the BPharm and PharmD curricula using a composite of global reference documents GbCf, NS and PWDGS and local requirements.
- Understanding that implementation is a big national challenge. This study has not only outlined immediately implementable recommendations but provided guidance within each descriptor.
- This study aligns with global and regional research priorities, contributing to the sparse pharmacy workforce data in Nigeria, and provides guidance not just for national policy making also but for countries with similar context.

The freedom to mix methods has also led to several strengths and weaknesses inherent to the specific methodology and methods chosen. Acknowledging these are also an indication of reflexivity which I have tried to maintain throughout the study. These have been extensively discussed below as well as ways that I have ensured quality, rigour and trustworthiness which can be found in chapter 2. However, the study is not without limitations in both planning and implementation phases (Simon, 2011) as is the case with most research. Pharmacists register used for sampling and analysis in this study was based on data provided by PCN. However, without national census data to verify PCN pharmacy register, the workforce data will remain unverifiable. While it is mandatory to register before practice, some practice settings do not require proof of registration so there is a possibility that pharmacist workforce data underrepresents the actual number of pharmacists in practice. The survey was electronically distributed, it was assumed that pharmacists should be able to fill an electronic survey, but pharmacy population without access to internet services or power supply such as those in remote rural settings may have been excluded.

In the qualitative phase, the discrepancy between what participants were actually saying and what I thought they were saying was a possibility, participants may have told me what they thought I wanted to hear. Data from interviews relied on participants ability to accurately report on workforce development which may not have always been the case. For the telephone interviews, the non-verbal aspects of communication could not be captured. Sampling technique was purposive hence there was a possibility that stakeholders selected did not adequately represent the views of their geopolitical zones or sector of practice. I was unable to conduct a focus group in the North east geopolitical zone due to insecurity, hence I missed perspectives from participants who practice in that zone though they were

represented by a participant in another focus group and in the quantitative phase. There were cases of unequal participation in focus groups, hence the views of participants representing one sector may have overshadowed less vocal participants. The most important validity issues possibly faced were representation, legitimation and integration. Representation was due to the difficulty in adequately representing stakeholder perspectives through text and numbers. Legitimation describes the trustworthiness of inferences made which could potentially affect transferability. Integration refers to possible multiplicative and additive threats to validity and trustworthiness that result from combining methods as described above.

Survey sampling stratification was random based on pharmacy register provided by the PCN which may not be accurate, up-to date, or a complete record of pharmacists in Nigeria. The survey method had to rely on the inherently fallible self-reporting of respondents for data, which does not enjoy the usual checks such as peer-review found in other methods. With a 34% response rate, there was a possibility that non-responders had different views from responders which may not provide an accurate view of Nigerian pharmacists' perspectives on workforce development. The survey instrument was custom made and though validated, may not be as reliable as standardized ones. It was also possible that interview participants were selected to fill in the survey and this may have biased their views.

The official documents used for the documentary analysis included the BMAS which was still being reviewed at the time of research, which meant I had to wait for the final copy which was only produced at the last year of my PhD, and was quite difficult to get hold of. While efforts were made to ensure I obtained this directly from the regulatory director, the content accuracy of some of these documents cannot be verified. A second coder for the documentary analysis phase would have increased confidence in categorization into predetermined codes but due to time and resource constraints this could not be achieved. Hence future work can include revalidation by an independent coder to verify findings.

Others included conflicting data (Creswell, 2002; Creswell and Tashakkori 2007) especially when findings are intended to inform policy (Teddlie and (Tashakkori, 2008): cases where qualitative and quantitative data were contradictory, though the aim of this project was not to compare qualitative and quantitative data, there were rare occasions where an obvious contradiction appeared. In which case I went back to the qualitative data to reread it in context, and when this persisted I accepted that the two sets of inferences reveal different aspects of the phenomena (Teddlie and Tashakkori, 2008) and that there is greater complexity in that aspect of the needs-based phenomenon than can be captured by any single perspective (Shaffer, 2002; Teddlie and Tashakkori, 2008). Hence, it is possible that the

interview questions asked did not identify all important aspects of fitness-for-purpose. The sample was limited to pharmacists, interviewing other health professionals may have provided a different perspective and more insight into the topic. Understanding that every researcher brings a preconceived set of ideas and beliefs to the research, I am aware that it is quite possible that through the questions I have asked or not asked I may have swayed the data. To counter this possibility, quantitative measures were used to further explore the perspectives of participants.

7.3 Key Findings

The key findings of the study can be categorized under three main themes pharmacy education capacity, pharmacy profession and practice, national systems and policy (see table 7.3). These were identified as critical sub-systems and building blocks necessary for needs-based workforce development.

Table 7.3: Key findings and change drivers

MAJOR THEME	KEY CHANGE DRIVER
PHARMACY EDUCATION CAPACITY	Globally compliant yet locally relevant training programme
PHARMACY PROFESSION AND PRACTICE	Professional recognition within an enabling environment
NATIONAL SYSTEMS AND POLICY	Efficient and equitable allocation of resources

The benefit of the mixed methods methodology was the ability to expand the scope of research possible while exploring both qualitative and quantitative responses within new initiatives and hard to measure complex phenomena, such as fit-for-purpose workforce development. (O'Cathain and Thomas, 2007).

When education progress is sought, curriculum change is often the first step taken. This research has shown that this change while being useful is not enough. Several other factors need to be taken into consideration for this change to produce desired results. A globally and locally relevant curriculum in this study did not necessarily result in a globally and locally relevant programme. Based on study findings, principles that may underpin pharmacy education in the future include a concise, relevant, less science-based and more patient-focused curriculum, more opportunities for experiential and practice-based learning, integrated teaching, up-to date pedagogies underpinned by technology, cross-disciplinary and interprofessional education, incorporation of CPD and lifelong learning, formal teacher training for educators at the start of employment and opportunities for continuous development, better student support, an independent academic calendar, among others. While this study reflected education's attempt to match

practice realities, in the future, education institutions can and should aspire to foster and drive practice change (Doherty et al., 2013).

While the BPharm had been a good programme with reliance on sound scientific principles it is gradually running out of relevance to emerging practice. It was clear from this study that an improved programme designed to meet current and future needs is needed, and the approach to this undergraduate programme change must be reflective. Having learnt that pharmacy programmes even in HICS had challenges at the commencement of the PharmD, the presence of challenges should not serve as a deterrent but a motivator for necessary structural change and infrastructural upgrade. Whatever the name of the new programme, it should take into consideration the local context as well as identified needs and priorities to ensure sustained success.

7.4 Research Benefits

This research has:

Identified both general and context specific domains for pharmacy workforce development in the Nigerian context.

Determined the current status of workforce development in Nigeria in line with identified domains

Identified performance gaps that will need to be addressed in order to produce fit-for-purpose competent and confident pharmacists

Identified motivators, barriers, and facilitators to the PharmD switch in the LMIC context

Summarily highlighted three major areas of focus for education decision makers which would aid directed policy planning and implementation.

Analysed undergraduate pharmacy curricula to determine both global compliance and local relevance hence highlight gaps or areas of irrelevance.

Involved stakeholders in all processes of the research to ensure shared ownership for decisions made which may be useful for the implementation stage.

7.5 Recommendations and Guidance for Implementation

Understanding that a functioning health system depends on adequate number of equitably distributed, appropriately trained and motivated pharmacists promoting equitable access to essential medicines and primary healthcare, this research urges the government and all stakeholders to prioritize health system strengthening including ensuring a fit-for-purpose pharmacy workforce. The following recommendations have been made for new instructional and institutional strategies towards its achievement.

Curriculum

The current pseudo British- American pharmacy education structure should be reconsidered on account of its non-applicability to the Nigerian context. Ideas alien to the Nigerian culture and context may not have a good chance at success, hence an indigenous system collaboratively decided and socially accountable, needs to be adapted.

The broad curriculum which leads to student fatigue and increased workload for pharmacy educators can be streamlined.

Curricular territorialism should be discouraged, redundant and irrelevant areas should be removed as well as repetition, this would also make room for more relevant areas to be incorporated as required.

Curriculum reviews should also consider the future direction of the profession to ensure continued relevance of pharmacists and self-directed learning initiated at student level in preparation for CPD.

CPD should be linked to career development and relicensing for all cadres of pharmacists.

Pedagogies

Innovative, practice-based teaching and learning strategies, approaches and tools should be considered.

Integrated teaching should be the mode of delivery for this new curriculum where topics are taught as themes to improve students' understanding. Fit-for-purpose pedagogy is one that is able to integrate composite departmental inputs to ensure the central purpose of education is fulfilled.

More efficient ways of teaching involving ICT, and active learning should be explored for better curricular delivery, and to improve students' engagement.

Experiential and Practice-based learning

Students should be allowed more opportunities for experiential education. This stimulates and sustains interest in the profession, consolidates transferable skills acquired and allows for practical application of taught concepts.

These should be closely supervised, and effectiveness evaluated to prevent it from becoming a tick box activity rather than an enriching learning experience.

Student Support

Academic, emotional and career support should be provided to pharmacy students in form of available and compassionate course advisers, peer mentoring, and mentoring by expert pharmacists.

These should be extended to early career pharmacists as well to facilitate transitioning into professional practice.

Faculty Capacity and Competence

Support structures for scaling up educators including better infrastructure, ensuring the right level of relevant training with supervision and/or mentoring to ensure sustainable results. Lecturers should be trained to teach on commencement of employment and opportunities for continuing development programmes and in-service training relevant to evolving healthcare needs of the society should be provided. Mandatory faculty development programmes relevant to healthcare needs are a good way to go about this.

Maintenance of competence should be prioritized in appraisal and other evaluative exercises.

Innovative expansion of faculty should be considered; teacher practitioners, clinicians, and expert pharmacists can be employed as educators.

Quality Assurance

Capacity for health workforce governance and regulation should be strengthened.

Accreditation standards should be made available to the public to foster transparency and should be equitably applied.

Mechanisms should be put in place to ensure that standards once attained are maintained throughout the course of the pharmacy programme.

A national competency framework should be drafted to appropriately define expected knowledge, skills and attitudes across all settings.

Professional Identity and Specialization

Pharmacists should be recognized in national policy documents as primary healthcare providers, and this should be reflected in their ability to provide in-patient pharmaceutical care.

Policies should be enacted to establish clear postgraduation career progression pathways using streamlined or ladder programmes for advancement of practising pharmacists.

Opportunities for clearly defined specialization in various clinical areas should be considered and necessary structural reforms commenced towards its actualization, as this would likely lead to much desired role definition.

Already existent consultant cadres should be incorporated into national policies and commensurate remuneration effected.

Programmes should be put in place for the development of leadership skills, to continually assess competency of consultant and expert pharmacists as well as establish markers for advancement and specialization.

Resource Efficiency

Investment in the health workforce should be mobilized and aligned to ensure implementation of strategies and policies to meet current and future health workforce needs. Adequate funding must be prioritized for improving education and employment capacity for and quality of pharmacists.

Efficient and equitable distribution of available resources must be a priority objective at all levels of leadership.

Accountability must be emphasized, and mismanagement of education resources at any level should be made a serious offence. Every effort should be made to eradicate corruption from the education sector to ensure that available resources are appropriately utilized for the common good.

Collaboration

There is an urgent need for intersectoral collaboration and shared accountability among the Ministry of Health, Ministry of Education, public and private institutions, and health professional organizations to strengthen pharmacy workforce development to ensure the production of competent pharmacists who can contribute to the health status of the country.

Greater alignment between education institutions and the practice sector would be necessary for fit-for-purpose workforce development as well as bring about required change to prepare graduates who would work in rural and remote areas thereby addressing the issue of health and access inequities.

Institutions of learning would benefit from periodic scheduled discussions or structured channels of communication with employers to get feedback on graduate performance, keep abreast with recent advances in practice; how these could be reflected in the curriculum and establish research partnerships for professional progress.

Efforts should also include interprofessional and cross disciplinary education within undergraduate programmes.

Workforce Numbers, Training, Distribution

Capacity building should include infrastructural upgrade to train an adequate number of pharmacy students to meet the country's needs. This includes health workforce planning, retraining and retention strategies. Strategies should be devised to scale up workforce numbers.

Focus should be on recruiting and retaining an adequate number of competent and motivated educators who are kept up to date within their chosen areas of specialization. Their teaching skills and motivation should reflect positively on the pharmacy profession.

Geopolitical imbalances in pharmacists' distribution and their causes should be analysed by monitoring labour market dynamics. The effect of health workforce imbalances should be mitigated by providing suitable incentives, financial and otherwise, as well as a safe and enabling working environment to pharmacy students who school in rural areas to aid retention in areas with unmet service needs.

Evidence-based strengthening of the workforce database should be considered for designing, implementing and monitoring strategic plans. Pharmacy workforce development should be monitored, and trends identified to enable informed planning and decision making.

Government Policies

Comprehensive workforce development policies should be enacted and implemented, and strategic plans developed to optimize available workforce availability, accessibility, quality and performance based on an understanding of labour market dynamics.

Enrolment criteria and selection procedures should ensure that qualified, motivated students with appropriate non-cognitive skills are attracted and admitted. Targeted admission policies to increase the socio-economic, ethnic and geopolitical diversity of students should be enacted.

Budgetary allocation to education and research should be upwardly reviewed.

Policies should promote equal leadership opportunities at all levels of decision making, health equity, and access to quality education across the country as well as equitable national security should be prioritized.

Decentralization of implementation brought on by a sense of ownership increases chances of applicability. Ultimately, country ownership of study findings backed by political commitment and partnerships to facilitate needed reform at national, regional and local levels would be necessary for recommendations in this study to be translated into present day reality.

7.6 Conclusion

This final chapter discussed the major overarching needs that would have to be met in order to achieve fit-for-purpose pharmacy workforce development in the Nigerian context: a globally relevant yet locally applicable programme, professional recognition within an enabling environment, as well as efficient and equitable resource management.

In light of findings, significant shifts in education and practice that will characterize the needs-based approach include: creating positive, inspiring, and responsive learning environments, adopting course appropriate pedagogies, utilizing locally relevant curricula, prioritizing educator development and training, nurturing self-directed life-long learning in students, involving collaborative, inter-professional teams, building partnerships within the community and other agencies and ensuring continuous relevance by regular review since needs are dynamic. Also recognizing that shared goals can be better achieved by working together in an interdependent and reciprocal manner, this study aimed to move pharmacists beyond traditional isolated roles which involve working in silos to the creation of educational partnerships or teams that are open to new ways of ensuring fit-for-purpose service delivery. Pharmacists skills are appropriately and adequately utilized in practice, patients are aware of the capabilities of a pharmacist, favourable and enforceable government policies are enacted, education is adequately funded, the profession is effectively regulated, corruption and funds embezzlement are eradicated.

The benefits of the needs based approach include the following: students are provided with support in the development and attainment of competencies for independent practice, students have access to an appropriate learning experience; resources, and inclusive opportunities to reach their potential, educators work collaboratively across disciplines to provide a well-rounded curriculum, have opportunities for self-development, and generate ideas for future progress, pharmacy graduates have job satisfaction and experience the confidence that comes from being fully equipped to function effectively in one's role, employers are satisfied with the quality of graduates, pharmaceutical care is practiced as pharmacists are trained ready to meet patient's needs, the health status of the country is improved with pharmacist being key healthcare providers, global goals can be achieved if this is practiced in all 'areas of greatest need'.

As stated at the beginning, this research has been undertaken pragmatically, the focus has been on capturing different perspectives and orienting myself towards solving practical pharmacy workforce development problems in the real world. My background knowledge of pharmacy education in the Nigerian context, having specific research questions, and using several intensive methods such as audio recorded interviews and focus groups, and collection of documentary materials to answer my question ensured this.

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9 Appendices

9.1 Appendix 1: BMAS Codes for Content Analysis

Appendix 1: Basic Minimum Academic Standards (BMAS) codes for Content Analysis

1. **Philosophy and Objectives of both programmes**
   1. **Philosophy**
      a. Capable of critical thinking
      b. Capable of life-long learning
      c. Knowledgeable in practice of pharmacy
2. **Aims and Objectives**
   1. **B. Pharm**
   a. Appreciation for the profession
   b. Knowledge skills and attitudes of basic pharmaceutical sciences
   c. Capable of independent analytical thinking
   d. Capable of problem solving with respect to drug-related problems
   e. Ability to communicate effectively with patients and caregivers
   f. Promoting healthcare and optimal use of drugs
   g. Function confidently multi-disciplinary teams
   h. Maintain professional and ethical standards of practice
   i. Knowledge in manufacture, drug quality and distribution of drugs
   j. Leadership and management skills
   k. Understand dynamic nature of profession which necessitates lifelong learning
   l. Foundational knowledge adequate for progression into specialized areas.
   2. **Pharm. D**
   a. Broad balance foundation in all areas of pharmaceutical knowledge
   b. Ability to apply pharmaceutical knowledge in health care delivery systems
   c. Knowledge and skills to identify and resolve drug related problems
   d. Respond to changing environment of profession in healthcare delivery
   e. comprehensive knowledge of pathophysiology, therapeutics, pharmacokinetics and toxicology
   f. ability to observe and analyse symptomatology of various diseases stats with emphasis on monitoring drug therapy
   g. ability to expand adequate database from the patient, client, and other health professionals
   h. ability to independently use patients' medication profile to evaluate and assess outcomes of drug therapy
   i. Instil in students a sense of appreciation of the profession and involve them in intellectually stimulating and satisfying experience of learning
   j. Adequate knowledge and appropriate skill base to proceed to specialized areas of pharmacy
   k. Instil the dynamic value of the profession which makes lifelong learning a necessity.
3. **Admission**
   l. By Unified Tertiary Matriculation Examination, Direct entry or inter-university transfer mode.
4. **Curriculum**
   a. Review done every 5 years
   m. Tailored to needs of the learner and market requirements
   n. Incorporate skills for the present and the future.
   o. Teaching and learning methods should meet current and future standards

p. Quality teaching and learning materials
q. Favourable learner outcomes
r. Seek stakeholder views on quality and relevance of curriculum
s. Within university academic auditing
t. Feedback from graduates
u. Feedback from employers

5. **Work Experience**
   a. Mandatory 6 months students industrial work experience scheme
   b. Externship sand clerkships rotated between hospital and community pharmacies
6. **Assessments**
   a. By practical evaluation, continuous assessment and written examination
   b. External examiners vet and moderate assessment
7. **Quality Standards**
   a. Students evaluation of courses
   a. Ensure minimum standards are attained, maintained and enhanced (accreditation)
   b. Graduates attain acceptable level of competence
   c. Programmes offered are of acceptable international standard
8. **Staff**
   a. Minimum of six fulltime academic staff in each department
   b. Minimum staff student ratio should be 1:15
   c. Maximum of 15 contact hours per week each for staff
   d. All staff must contribute to and be familiar with programme
   e. Reasonable number of staff with higher degrees and sufficient professional experience.
   f. Full time academic staff should have a second degree minimum to ensure acceptance of concept of goals and objectives of the degree programme
   g. Staff must be experienced both in teaching and providing patient care with appropriate balance.
   h. Staff have opportunities for development, commitment to research and scholarship
   i. Recommended minimum academic staff mix: Professors-20%, Senior Lecturers-35%, Lecturer 1 and below-45%
   j. Teacher practitioners and preceptors with high degree of regular responsibility of care for patients.
   k. Sufficient administrative and technical support staff
9. **Infrastructure**
   a. Sufficient spaces for academic areas according to recommendations.
   b. Adequate teaching laboratory spaces per recommendations.
   c. Specialized areas for sterilization, grinding, conference rooms, seminar rooms, staff common rooms, lecture theatres and locked spaces etc
10. **Equipment**
    a. Should be of minimum acceptable number
    b. Should be in accordance with specified standards
12. **Library and information resources**
    a. Faculty library with reference books, journals and periodicals

b. E-learning facility with wireless internet is recommended.

13. **Department Structure (Minimum of these departments)**
    a. Clinical Pharmacy and Pharmacy Administration
    b. Pharmaceutical and Medicinal Chemistry
    c. Pharmaceutical Microbiology
    d. Pharmaceutics and pharmaceutical technology
    e. Pharmacognosy
    f. Pharmacology

1. **Course structure of both programmes**
    1. **Basic Courses**
        1. **General studies programme**- To produce well-rounded, morally and intellectually capable graduates with vision and entrepreneurial skills in an environment of peace and social cohesiveness. Acquiring a body of knowledge outside area of specialization, competence in the use of English Language
            a. Communication in English
            b. Basic communication in French
            c. Basic communication in Arabic
            d. Logic, philosophy and Human existence
            e. Nigerian peoples and culture
            f. Use of library, study skills and ICT
            g. Contemporary Health Issues
            h. Environment and Sustainable Development
            i. Peace and conflict Resolution
            j. Entrepreneurship
            k. Leadership skills
        2. **Entrepreneurship**- To re-orient students towards a job-creation mindset rather than the fixed attitude of job seeking by introducing them to concepts and opportunities available in entrepreneurship and innovation.
            a. Analyse historical perspectives of entrepreneurship in Nigeria and relate it to recent trends of unemployment and job dissatisfaction
            b. Cultivate spirit of entrepreneurship
            c. Build capacity to develop business plan and start business
        3. **Student Industrial Work Experience Scheme (SIWES)**- Organized exposure to some element of industrial art. Relevant productive work in community, hospitals and industries as an integral part of their academic work in universities.
            a. Solicit and place students on training assignments
            b. Coo-ordinate and supervise, ensure they acquire useful pharmaceutical and clinical skill son real jobs under actual working conditions
            c. Check students' performance regularly through company visits and student interview
            d. Keep necessary records
            e. Organize seminars on work reports
        4. **Basic Sciences- These are proposed courses at 100 level for both B. Pharm and Pharm. D programmes**
            a. General Biology theory and practical
            b. General chemistry theory and practical

c. General physics theory and practical
d. Introduction to computer science
e. Elementary Mathematics

2. Course structure at 200 level (B. Pharm)
a. Introductory anatomy and Histology
b. Peace studies and conflict resolution
c. Introduction to entrepreneurship
d. Leadership skills
e. Information Communication Technology
f. Organized Vegetable drugs
g. Unorganized vegetable drugs
h. Inorganic pharmaceutical chemistry
i. Physical pharmaceutical chemistry
j. Organic pharmaceutical chemistry
k. Introductory Pharmaceutics
l. Unit operations
m. Introductory pharmaceutical microbiology
n. General physiology 1
o. General physiology 2
p. Sensory Systems

3. Course structure at 200 level (Pharm. D)
a. Basic anatomy
b. Neuroanatomy
c. Histology
d. Biochemistry
e. Introductory Molecular Biology
f. Introduction to Entrepreneurial skills
g. Information and Communication Technology
h. Introduction to Pharmacognosy
i. Physical Pharmaceutical Chemistry
j. Inorganic Pharmaceutical Chemistry
k. Pharmaceutics
l. Pharmaceutical calculations
m. Introduction to pharmaceutical microbiology
n. Introductory and blood physiology
o. Neurophysiology and special senses

4. Course structure at 300 level (B. Pharm)
a. Separation Techniques Pharmacognosy
b. Drug of biological origin
c. Drug dosage forms
d. Physical pharmaceutics 1
e. Applied pharmaceutical microbiology 1
f. Principles of sterilization and asepsis
g. Entrepreneurship
h. Biostatistics
i. Physical Pharmaceutical Chemistry 2

j. Organic Pharmaceutical Chemistry 2
k. Pharmacoeconomics
l. Introductory pharmacology
m. Pharmacology of the autonomic Nervous system
n. Pharmacology of the hematopoietic system and Gastrointestinal tract
o. Clinical Pharmacy
p. Chemistry and Biochemistry of Macromolecules

5. Course structure at 300 level (Pharm. D)
   a. Biopharmaceutics and pharmacokinetics
   b. Health psychology
   c. Leadership skills
   d. Entrepreneurship
   e. Pharmacognosy
   f. Organic Pharmaceutical chemistry
   g. Pharmaceutical analysis 1
   h. Physical pharmaceutics 1
   i. Rheology
   j. Physical pharmaceutics 2
   k. General principles of pharmacology
   l. Autonomic/Neuro-pharmacology
   m. Pharmaceutical Microbiology
   n. Pharmacy Administration
6. Course structure at 400 level (B. Pharm)
   a. Phytochemistry and Biosynthesis of Natural Products
   b. Medicinal Plants/Traditional Medicine
   c. Drug dosage Forms 2
   d. Physical pharmaceutics 2
   e. Dispensing
   f. Applied pharmaceutical microbiology
   g. Pharmaceutical Analysis
   h. Medicinal chemistry1
   i. Pharmacology of the cardiovascular system
   j. Pharmacology of the central nervous system
   k. Clinical Pharmacy 2
   l. Clinical pharmacy practicals and tutorials
   m. Pharmacy Management
   n. Forensic Pharmacy and pharmacy ethics
   o. Biotechnology
   p. Information and Communication Technology in pharmacy 2
   q. Veterinary Pharmacy
   r. SIWES
7. Course structure at 400 level Pharm. D
   a. Pharmaceutical Biotechnology
   b. Introductory Clinical Pharmacy
   c. Pharmaceutical immunology and vaccines
   d. Essentials of nutrition
   e. Pathology

f. Pathophysiology 1
g. General Phytochemical Methods in drug analysis
h. Secondary plant metabolites
i. Instrumental methods of analysis of pharmaceuticals
j. Medicinal chemistry- drug design
k. Dosage form evaluation and drug stability
l. Physical pharmaceutics
m. Chemotherapy
n. Cardiovascular and endocrine pharmacology
o. Biostatistics and research methodology
p. Pharmacy Laws and ethics
q. Pharmacy communication skills and public speaking
r. SIWES

8. **Course structure at 500 level (B. Pharm)**

a. Evaluation of phytopharmaceuticals
b. Herbal complementary and other alternative medicines
c. Formulation processes
d. Production and quality control of cosmetics
e. Applied pharmaceutical microbiology 2
f. Pharmaceutical analysis 2 and Drug Quality Assurance
g. Medicinal Chemistry 2
h. Principles of Drug Design
i. Clinical Pharmacy 2
j. Literature evaluation and communication skills
k. Public Health Pharmacy
l. Clinical Pharmacy Clerkship
m. Pharmaceutical Marketing
n. Chemotherapy
o. Project

9. **Course structure at 500 level (Pharm. D)**

a. Pharmaceutical Biotechnology
b. Clinical pharmacokinetics
c. Clinical pharmacy Clerkship 1
d. Clinical and environmental toxicology
e. Pharmacotherapeutics 1
f. Veterinary pharmacy and agrochemicals
g. Pharmaceutical care
h. Pathophysiology
i. Herbal, complementary and other alternative medicines
j. Drug Quality Assurance
k. Medicinal Chemistry
l. Industrial set-up and Formulation Processes
m. Central Nervous System Pharmacology
n. Biochemical Pharmacology
o. Microbial chemotherapy and bacterial genetics
p. Preservation and fermentation biotechnology
q. Pharmacy Administration

r. Pharmacoeconomics

10. **Course structure at 600 level (Pharm. D)**
    a. Pharmacogenetics and genomics
    b. Clinical pharmacy clerkship 2
    c. Clinical Pharmacy clerkship 3
    d. Pharmacotherapeutics 2
    e. Project
    f. Radio-pharmaceuticals
    g. Industrial pharmacy
    h. Drug Information Services
    i. Public Health pharmacy and pharmacoepidemiology

2. **B. Pharm and Pharm. D Competencies and specifications**
    a. Preparing, Compounding, and packaging of drugs
    b. Management of procurement, storage and dispensing of drugs and medicaments
    c. Synthesis of drugs
    d. Quality assurance of drugs
    e. Good manufacturing practice and pre-qualification
    f. Monitoring of drug utilization by the patient
    g. accessing information on drugs
    h. providing drug information to patients and other health professionals
    i. guiding patients in the selection and use of non-prescription drugs
    j. ability to function knowledgeably, confidently and consistently as part of the healthcare team.
    k. Function with professional and ethical standards of practice
    l. Rural services to be integrated into work experience programme in final year
    m. Students should be exposed to pilot drug production unit
    n. Enhanced knowledge should be imparted from which further studies in specialized areas of pharmacy can be undertaken (*PharmD)
    o. Enhanced professional practice confidence to respond adequately to challenges in discharge of his professional responsibility.

9.2 Appendix 2: Three-Year Research Timeline

<table>
<tr><td rowspan="3">Year 1 (2017)</td><td>Dec</td><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td></tr>
<tr><td colspan="8">Literature and Scoping Review</td><td colspan="4"></td></tr>
<tr><td></td><td colspan="7">Research Training</td><td colspan="3"></td><td>Ethics</td></tr>
<tr><td rowspan="2">Year 2 (2018)</td><td colspan="5">Field work Preparation/ Waiting for safety approval</td><td colspan="3">Field Work: move to Nigeria</td><td colspan="4">Interview Transcription</td></tr>
<tr><td colspan="5">Data Analysis</td><td colspan="7"></td></tr>
<tr><td>Year 3 (2019)</td><td></td><td colspan="4">Instrument Development</td><td colspan="3">Instrument Validation</td><td colspan="3">Survey</td><td colspan="2">Write Up</td></tr>
<tr><td>Year 4 (2020)</td><td colspan="5">Write up and Submission</td><td colspan="7"></td></tr>
</table>

9.3 Appendix 3: FCO Travel Advice for Nigeria

9.4 Appendix 4: Interview Schedules

4a: Individual Interview Schedule

Semi-structured Interviews with the Deans of the Accredited Pharmacy Schools

Greeting

Warm up Questions

1. Can you tell me about your Pharmacy School? (What are you proud of? What are the challenges?)
2. Can you describe Pharmacy practice in Nigeria in one word?

Exploration Questions

3. What are your views/thoughts about Pharmacy Education in Nigeria?

(Probe questions- What are the strong points? What needs changing? Which is the most important of the improvement areas? How does it compare with what is going on in Pharmacy Education globally?)

4. What do you think of the change to the PharmD Pharmacy programme?

(Probe question- What drove this change? What are the benefits or challenges {if any}? Seeing this is clinically focused, what happens to industry? Do we have clinicians and placement sites etc to run this programme?)

5. How is the curriculum for the pharmacy programme in this faculty developed and how is it going to be developed for the PharmD programme?

(Probe question- How does this curriculum fit with current realities of practice?)

6. There is a term "needs-based education" which simply refers to fit-for purpose education……?

(Probe question- Would you say PharmEd is needs-based? Can you kindly explain why/why not? If not how can we ensure it is needs-based?)

7. What competencies must student achieve here to qualify as Pharmacists?

(Probe question- Do you have a student handbook or an official record of such competencies? How are these competencies measured? These are some of the perceived services Pharmacists should render from the focus groups…. Would you say these competencies assure said services?)

8. Do you think Pharmacy Education is relevant to practice in Nigeria?

(Probe question- How do you think it can be more relevant? If this new pharmacy programme is developed based on what Pharmacists really need to learn would you be happy to implement it? What facilitators do you perceive for this program? What barriers do you foresee to its implementation?)

9. Can you suggest possible solutions to these barriers?

Exit Question

10. Is there anything else you would like to say about Pharmacy Education in Nigeria?

(Probe question- What did you find most interesting in this interview?)

Semi-Structured Interviews with Others: Education and Regulatory Directors

Warm-up Question

1.Can you tell me about your role, what has your experience been like, what your challenges are, what are you proud of so far?

2.If you were to describe pharmacy education in one word just one word, what would you say about pharmacy education in Nigeria presently?

Exploration Questions

2. What do you think of the Pharm D programme, what do you think the benefits would be, what do you think the challenges are and what would you say drove the change to the PharmD?
3. How was the curriculum developed for the Pharm D program?
   Probe- Was there some research carried out to determine what the students need, what the society needs, in terms of healthcare needs, in terms of their professional needs how was the curriculum put together because I am aware that the curriculum has been put together now, there's like a draft, so how was that draft made?
4. How do you think this new curriculum will meet the needs of the society, meet the healthcare needs and the needs of students who are studying pharmacy?
   Probe- Some say there's an imbalance in the curriculum, that pharmacists practicing in the industry feel that they are not well trained, while the people who practice in the hospitals feel that they are over trained. Has that balance been considered when the curriculum was made has it been corrected in the new PharmD curriculum?
5. How do you think that this new program will lead to better practice?
   Probe-You know pharmacy education is different from pharmacy practice, now that there is a new educational program how do you think that there would be a change in pharmacy practice also?
6. So how would you say pharmacy education in Nigeria compares to pharmacy education globally?
7. Some say there are regional differences in pharmacy practice across the country, would you agree and if so why, if not, why not?
   Probe - With these numbers will you say we have a workforce shortage in Nigeria, do we have a shortage of pharmacists, do we need to train more pharmacists in Nigeria? Do you think there's a shortage or just a distribution problem?
8. Why do you think that a large number of pharmacists go out of the country to practice?
9. Is there any form of teacher training for lecturers other than the initial training they receive as pharmacists?

Exit Question

10. Alright finally Sir is there anything else you would like to say about the pharmacy undergraduate education in Nigeria now in general, maybe something I haven't asked but something that you feel would be important for me to know?

4b: Group Interview Schedule

Engagement/ Warm up Questions

1. What has your experience as a Pharmacist been like compared to your initial expectations?
2. How did these expectations come about?
3. Can you describe Pharmacy practice in Nigeria in one word?

Exploration Questions

4. What are your views about Pharmacy education in Nigeria?

(Probe questions- What would you say needs improvement? {Write them down on a piece of paper?} If you were to pick one most important improvement point what will it be?)

5. What are your thoughts about the approved PharmD undergraduate programme?

(Probe question- Why was the BPharm changed?

6. How do you think we can ensure that the new Pharmacy programme is relevant to practice?

(Probe question- Will the new programme affect practice/ Is practice likely to change? Does its relevance matter? Is there anything that can be done to ensure this?)

BREAK

7. What do you understand by the term "needs based education?"

(Probe question- In light of this understanding, would you say that pharmacy education is needs-based? Why/why not?)

DISCUSS NEEDS-SERVICES-COMPETENCIES-EDUCATION FRAMEWORK.

8. What would we say are the patient needs, learning needs of the student, training needs of the trainer, and professional needs of the pharmacist? (I will give examples then give one coloured stick on pad per category)

(Probe question- Can we discuss other categories of needs?)

9. What services would Pharmacists be required to provide in order to meet these needs?

(Probe question- Are Pharmacists currently providing these services

10. What barriers and facilitators do you foresee to needs-based education?

(Probe question-

Exit Questions

11. Is there anything else you would like to say about what we have discussed so far? (Go around the table to ask everyone, ensure everyone makes a contribution)

(Probe question- Finally of all the things we have discussed what is most important to you?)

9.5 Appendix 5: Survey Questionnaire

Stakeholders' Perspectives on Needs-Based Pharmacy Education in Nigeria Survey

Page 1: Page 1

A National Survey: Pharmacists' Perceptions of Needs-Based Pharmacy Education in Nigeria.

Information Sheet for Survey Participants

You are being invited to participate in this research study. Before you decide whether you want to take part, it is important for you to understand why the research is being conducted, and what your participation will involve. Please read the following information carefully, and kindly contact me if anything is unclear, or if you would like more information. Thank you for reading this.

Purpose of this Study: Pharmacists' education must be needs-based to effectively contribute to the health needs of their own countries. The needs-based approach is one that ensures fit-for-purpose education and takes into account pertinent extrinsic factors which may have a huge impact on how well systems can work. It is the model for developing pharmacy education globally.

Aims: The success of such a needs-based approach requires ongoing consultation and co-operative partnerships between all stakeholders within countries and institutions, so there can be shared ownership for decision making, implementation and outcomes. This research therefore aims to explore stakeholders' views of needs-based education in Nigeria, while focusing on particular factors that serve as facilitators or barriers, their impact, and how best to handle them. This study is a prelude to in-depth analysis and further research of specific domains identified, towards possible execution of the needs-based approach which will ultimately lead to better health outcomes for patients.

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Why you have been invited: You have been invited to take part because you are a registered pharmacist in Nigeria, hence considered to be a pharmacy education stakeholder. Several other registered pharmacists have been invited to take part in this nationwide survey.

The Study: This survey will help determine if the views on needs-based pharmacy education shared in previously conducted interviews are nationally perceived as well as quantify the impact of factors likely to influence needs-based pharmacy education. It will take between **20-25** minutes to complete. I would be grateful if you answer the questions honestly and accurately to the best of your knowledge. This survey should only be completed once. **If you have completed this survey previously, please do not complete it again**. You are free to stop the survey at any point if you decide not to go on with it and this will not affect your status now or in the future. All data entered up till that time would be permanently deleted if you have not clicked the 'finish' button.

Benefits of taking part in the study: You will not be paid to participate in this survey, but the information we get from this study will help to understand pharmacy education in the context of a developing country. The knowledge from findings will help to make evidence-based recommendations to policy makers on key domains for a fit for purpose pharmacy programme in Nigeria. Further benefit can be obtained if findings are applied to countries with similar context.

Anonymity/Participation: We will follow ethical and legal practice, and all information about you will be handled in confidence. If you join the study, some parts of the data collected for the study will be looked at by authorised persons from the University of Nottingham, to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

Data Management: All information which is collected about you during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, as part of a password protected database. All responses to the questions in the questionnaire will be anonymised, and a unique code will be used for identification so that you cannot be recognised from your answers. All research data will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved, to maintain your confidentiality. Only members of the research team will have access to your personal data.

Data Analysis and Dissemination: After this phase of the study, data analysis would be done by the researcher under supervision. Once the thesis arising from this research has been completed, a brief summary of the findings will be made available by the researcher upon request. It is also possible that the results will be presented at academic conferences and published in journals. The study sponsor will be acknowledged in all publications.

This research is being organised by the University of Nottingham and is part funded by the

Niger Delta Development Commission (NDDC) in Nigeria as a doctoral scholarship awarded to the researcher, Ifunanya Ikhile. It has been reviewed and given a favourable opinion by the University of Nottingham, School of Education Ethics Committee. If you are concerned with any aspect of this study, you can contact the researcher, if you are still unsatisfied, please feel free to contact the University of Nottingham using the details below for further advice and information.

Researcher Contact:
Ikhile Ifunanya
School of Pharmacy
University Park
University of Nottingham,
NG7 2RD
+44(0) 115 951 3417
ifunanya.ikhile@nottingham.ac.uk

Chief Investigator Contact for further information:
Claire Anderson
School of Pharmacy
University Park
University of Nottingham,
NG7 2RD
+44(0) 115 951 5389
claire.anderson@nottingham.ac.uk

The contact email of the Research Ethics Coordinator should participants wish to make a complaint on ethical grounds is: educationresearchethics@nottingham.ac.uk

Page 2: Questionnaire Section A: Education Capacity

Questions in this section relate to your perception of pharmacy education capacity in Nigeria. This has been defined by four domains: Quality, Relevance, Efficiency and Equity of pharmacy education.

A1. Education Quality

This describes the extent to which Nigerian pharmacy education meets global standards, and how these standards are ensured and maintained.

1. Kindly choose responses from the provided options (**Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree**) to describe the extent to which the you agree with the statements below.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My undergraduate pharmacy degree prepared me to compete effectively with pharmacists trained in other countries of the world.	○	○	○	○	○
The BPharm curriculum focuses more on providing scientific information than on skills required for patient-focused practice.	○	○	○	○	○
Course-appropriate teaching techniques, employing information technology are now used in classrooms by pharmacy educators.	○	○	○	○	○
A PhD degree alone provides lecturers with requisite skills to teach undergraduate pharmacy courses.	○	○	○	○	○
The school environment for pharmacy students is comfortable, inspiring, and conducive for study.	○	○	○	○	○
Learning facilities and equipment during my undergraduate training were up to date with practice standards.	○	○	○	○	○

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Written assessments in pharmacy school usually require students to reproduce lecture notes rather than apply taught concepts.	○	○	○	○	○
Artificial barriers have been created to patient access in teaching hospitals that limit pharmacy students' experiential education.	○	○	○	○	○
Student evaluation of teaching is a useful index for promotion of lecturers.	○	○	○	○	○
Pharmacy students will benefit from being mentored by experienced practising pharmacists.	○	○	○	○	○
Interviewing orally before admission into pharmacy school to ascertain possession of desirable character traits will minimize school drop outs.	○	○	○	○	○

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A2. Education Relevance

This describes the extent to which education prepares pharmacy students for current and future practice experiences.

2. Kindly choose responses to the statements below from the provided options (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) to describe the extent to which they apply to Nigerian pharmacy education.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Knowledge, skills, and attitudes acquired in undergraduate pharmacy training are directly applicable during foundation practice in any chosen pharmaceutical sector.	○	○	○	○	○
Pharmacy graduates should be able to function optimally in all locally available pharmaceutical practice sectors before specializing.	○	○	○	○	○
I feel supported and encouraged to continually update my knowledge and skills to provide the best healthcare services in practice.	○	○	○	○	○
Country specific health care needs are prioritized in the Nigerian pharmacy undergraduate programme.	○	○	○	○	○
The undergraduate programme gives sufficient opportunity for applying scientific classroom knowledge and taught concepts in hospitals and other simulated real life settings.	○	○	○	○	○

Lecturers' teaching notes and other teaching materials are regularly updated to ensure information provided is up to date and supports future developments.					
Past experience, along with ongoing practice exposure in main areas of teaching and research, is necessary for educators to remain relevant in their field of expertise.					
Evidence based findings should inform context specific, collaborative decision making in pharmacy education and practice.					
Clearly set out standards, and pharmacists' roles, would facilitate a fit for purpose pharmacy programme.					

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A3. Education Efficiency

This describes the extent to which education outcomes can be maximized given available resources.

Please select the option which most appropriately completes the statements in 3-5 below

3. The proposed switch to the doctor of pharmacy (PharmD) programme was mainly because of:

4. The major barrier to the implementation of the PharmD programme is:

5. The societal healthcare challenge that should be most urgently addressed is:

6. Kindly choose responses from the provided options (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) to describe the extent to which the statements apply to Nigerian pharmacy education.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

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A clinically intensive, patient focused curriculum can be achieved with the current Bachelor of Pharmacy Programme.	○	○	○	○	○
A two track undergraduate pharmacy programme training either pharmacists or pharmaceutical scientists is preferable to a single programme training both.	○	○	○	○	○
The pharmacy programme should be allowed to run an independent school calendar (like medicine does) to effectively cover the course load of the undergraduate degree.	○	○	○	○	○
A teaching system in which topics are integrated and taught in themes without regard for departmental boundaries would be better for students' understanding than departmental teaching.	○	○	○	○	○
High work pressure, due to heavy workload, made worse by workforce shortage has negatively impacted pharmacy educators' academic productivity.	○	○	○	○	○
Interprofessional education and systems involving various health care professions in collaborative partnerships will achieve better health outcomes.	○	○	○	○	○
A strong partnership between pharmacy schools and the public/private sector is foundational for the achievement of a needs-based pharmacy programme.	○	○	○	○	○

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A4. Education Equity

This describes the extent to which previously mentioned domains are fairly and impartially experienced across all pharmacy schools.

7. Kindly choose responses to the statements below from the provided options (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) to describe the extent to which statements apply to Nigerian pharmacy education.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Nigerian pharmacy education fosters national equity through processes such as admission diversity and staff recruitment.	○	○	○	○	○
National accreditation standards are equitably applied across all pharmacy schools without prejudice.	○	○	○	○	○
The recently introduced pre-registration examination is a good way to standardize graduate quality across schools.	○	○	○	○	○
The curriculum should be uniform across the country, with no university variations in courses, to ensure pharmacy graduates are of similar quality.	○	○	○	○	○
Female pharmacists are not given the same professional opportunities after graduation as their male counterparts.	○	○	○	○	○
An age diverse education leadership will make better decisions than a gerontocratic one.	○	○	○	○	○

The geographical maldistribution of pharmacists can be addressed by providing incentives to students who school in rural or semi-rural areas to practise in same areas after graduation.	○	○	○	○	○
Insecurity, due to tribalism, ethnic and religious violence in certain geopolitical regions, has increased apprehension to schooling in those areas.	○	○	○	○	○

Page 6: Questionnaire Section B: Competencies

This section describes competencies: knowledge, skills and attitudes that students should possess to successfully and efficiently practice as pharmacists.

8. To what extent would you say your undergraduate pharmacy education equipped you with competencies in these areas? Kindly choose from the provided options (***To a very great extent, To a great extent, To a moderate extent, To a small extent, Not at all)*** as appropriate.

	To a very great extent	To a great extent	To a moderate extent	To a small extent	Not at all
Primary care, Consultation and Diagnosis	○	○	○	○	○
Drug Synthesis, Development and Manufacturing	○	○	○	○	○
Quality Control and Assurance	○	○	○	○	○
Evidence Based Care	○	○	○	○	○
Public Health Pharmacy	○	○	○	○	○
Rural Health and Community Practice	○	○	○	○	○
Veterinary Pharmacy	○	○	○	○	○
Policy and Implementation Science	○	○	○	○	○
Herbal and Alternative Medicine	○	○	○	○	○
Communication Skills	○	○	○	○	○
Problem Solving Skills	○	○	○	○	○
Reflexivity and Critical Thinking Skills	○	○	○	○	○
Research Skills	○	○	○	○	○

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Entrepreneurship, Finance and Business	○	○	○	○	○
Supply Chain Management	○	○	○	○	○
ICT Knowledge and Skills	○	○	○	○	○
Interprofessional Interaction	○	○	○	○	○
Leadership Skills	○	○	○	○	○
Social Determinants of Health	○	○	○	○	○
Collaboration and Teamwork	○	○	○	○	○
Lifelong Learning	○	○	○	○	○
Cultural Intelligence	○	○	○	○	○

Page 7: Questionnaire Section C: Demographic Information

9. Gender

- Male
- Female
- Prefer not to say

10. Age

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 years or older

11. Unversity attended for undergraduate degree (if more than one, please select the one you graduated from)

- UniMaid
- UniJos
- Unilorin
- ABU
- UDUS
- UNN
- NAU
- UniUyo
- UniBen
- Igbenedion
- UniPort
- Madonna
- DELSU
- NDU
- UI
- UniLag
- OAU
- OOU
- Outside Nigeria

12. Year graduated

- Before 1950
- 1950-1955
- 1956-1960
- 1961-1965
- 1966-1970
- 1971-1975
- 1976-1980
- 1981-1985
- 1986-1990
- 1991-1995
- 1996-2000
- 2001-2005
- 2006-2010
- 2011-2015
- 2016-2019

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13. Highest degree completed

- ○ Senior school certificate (WAEC/NECO)
- ○ Bachelors Degree (BSc/BPharm)
- ○ Masters Degree (MSc/MPharm,/MBA/WAPCP)
- ○ Doctor of Pharmacy (PharmD)
- ○ Doctor or Philosophy (PhD)

14. Sector of practice

- ☐ Hospital Practice
- ☐ Community practice
- ☐ Industrial Practice
- ☐ Academia/Research
- ☐ Administrative/Regulatory/Non-Profit Sales and Marketing
- ☐ Global Health/Public Health/NGO
- ☐ Other (Pharmacy)
- ☐ Non-pharmacy
- ☐ Outside Nigeria

15. Position at your workplace

- ○ Trainee/Student
- ○ Staff
- ○ Manager
- ○ Director
- ○ CEO

16. Number of years of practice

- ○ 0-5 years
- ○ 6-10 years
- ○ 11-20 years
- ○ 21-30 years
- ○ 31-40 years
- ○ More than 40 years

Geopolitical zones and States to help with questions below

North Central- Benue, Kogi, Kwara, Nasarawa,Niger, Plateau, FCT

North East- Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe

North West- Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Zamfara

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South South- Akwa-Ibom, Bayelsa, Cross River, Rivers, Delta, Edo

South East- Abia, Anambra, Ebonyi, Enugu, Imo

South West- Ekiti, Lagos, Ogun, Ondo, Osun, Oyo

17. Geopolitical zone of origin

- ○ North Central
- ○ North East
- ○ North West
- ○ South South
- ○ South East
- ○ South West

18. Geopolitical zone of practice

- ○ North Central
- ○ North East
- ○ North West
- ○ South South
- ○ South East
- ○ South West

Page 8: Thank You

Thank you for your participation!

Key for selection options

3 - The proposed switch to the doctor of pharmacy (PharmD) programme was mainly because of:

The doctor title
A need to contribute meaningfully to the health team
A need to align with global practices
Pharmacists' increasing clinical role in the country

4 - The major barrier to the implementation of the PharmD programme is:

Medical doctors' resistance
Pharmacists' non-acceptance
Poor academic capacity
An overloaded curriculum

5 - The societal healthcare challenge that should be most urgently addressed is:

Anitibiotic resistance
Emerging infectious diseases
Drug misuse and abuse
Charlatans in practice

9.6 Appendix 6: Table of Specifications for Item Generation

Pharmacy Education and Practice Status	Domains for NBE	Barriers to NBE	Facilitators to NBE
Chaotic drug distribution system	Experiential learning	Inadequate teacher training	Building Capacity
Charlatans in practice	Needs-based accreditation standards	Poor student support	Pharmacists who meet societal needs make more money
Comatose health system	Importance of attitude	Admission Pressure	Foreign Collaboration
Comparing standards with pharmacy education abroad	Bridging the Curricular Gap	Gerontocratic rigidity	Home grown PharmD catering to our specific context
Comparing with others rather than with standards	Leadership is instrumental to progress	Avoidance of responsibility	Indigenous Drug Production and Less Importation
Competition or collaboration which is it	Collaboration/ Collaborative Decision Making	Remunerating Teacher Practitioners and Preceptors	There is a need and desire to improve the pharmacy profession
Concerning needs assessment exercises	Provision of Primary care	Funding	
Unrealistic demands placed on students increases their practice expectations	Bridging Knowledge deficits	Competition or collaboration which is it	
Differences between pharmacy schools	Assessment	Conservative Pharmacy Teaching	
Differences between the BPharm and PharmD	Specialization based on available medical fields	Corrupt Student Admission Practices	
Building a needs-based pharmacy programme	Conducive learning environment	Corruption and funds diversion	
Competency based education	Curriculum development and review	Mode of assessment encourages cramming	

Do not understand the PharmD yet	Curriculum relevance to practice	Science focused curriculum	
Drug misuse and abuse problems	Maintain global standards	Rigid curriculum	
Education Practice Gap or Dynamics	Early exposure to clinical settings for pharmacy students	Curriculum research-focused, available jobs-practice focused	
Educators are the problem	Education should be in the mother tongue of Nigerians	Curriculum is too theory focused	
Educators often paint a rosy picture of pharmacy practice which is untrue	Employers Rating and Feedback of Pharmacy Students	Policy and Implementation science knowledge deficit	
Effect of economic power on patients' choice of health service provider	Engaging with students on faculty goals	Leadership by rotation and gerontocracy not by ability	
Effect of literacy level on quality of practice	Everything hinges on an enabling environment for practice	Departmental Curricular Territorialism	
Unfulfilled practice expectations	Evidence based decision making	Doctor pharmacist rivalry, who suffers, the patient	
First set of PharmD students have been admitted	Clinical services	Lack of Educator Motivation	
Foreign refining of chemicals hinders access to intermediate products useful as pharmaceutical excipients in drug manufacturing	Experience and ongoing practice exposure of pharmacy educators	Embargo on employment of more academic staff in the universities	
Formulation secrets kept since days of colonization is the reason for our lack of progress in pharmacy profession	Lifelong learning	Geographical Maldistribution of Pharmacists	
Societal frustrations hinder proper communication during round table meetings for intervention	CPD	Country high population	

Giving what you have to offer not necessarily what the society needs	Integrated Teaching System	Government policies affect practice	
Going through pharmacy school with no expectation or motivation	Interprofessional collaboration	Brain drain and workforce migration	
Government cannot do it all	Involving Alumni to determine the Gaps in education	Implementation bottlenecks in Nigeria	
High production cost	Involving Teacher Practitioners	Access to Research Grants	
High student Attrition rate because of pharmacy education training rigor	Medical doctors should be enlightened and made to see the big picture	Influence of social factors	
Hospital managerial positions have been hijacked by doctors	Multisector Versatile Curriculum	Insecurity	
Hospital not an ideal area of practice for upcoming pharmacists because they will get demotivated	Need to domesticate programme interventions for better access	Insufficient placement sites for students PharmD training	
Hospital policies excluding pharmacists from clinical practice	Specialization	Issues with pharmacists' access to teaching hospitals	
Importance of intervention timing in Nigeria	Non-clinical skills	Lack of confidence to proceed with the PharmD	
Impression that all research should be quantitative	Recognition of Pharmacists	Lack of coordinated progressive efforts by pharmacists	
Intern pharmacists reporting to technicians in military hospitals (Practice frustrations)	Patient education and public engagement	Lack of fulfilment in academic pharmacy practice	
Lack of confidence to proceed with the PharmD	Patient focused pharmaceutical care	Medical Doctors Resistance	

Lack of exposure and illiteracy of patients affects pharmacy practice	Improved Pedagogy	Modified colonial curriculum	
Level of development in the country has restricted scope of service	Peer training model	Lack of practice motivation	
Loopholes in the PharmD programme	Political Skills	Need or pressure to align with global practices	
Medicines production and handling differentiate Pharmacists form other health professionals	Employ more junior academic staff	Conflicting roles	
Most pharmacists end up in clinical practice after school	Needs-based knowledge	Certificate Orientation	
Need for mind-set shift in Nigerian Pharmacy	Practice focused curricula to build confidence	Overloaded curriculum	
Need for the PharmD Need to redefine the pharmacists' role	Starting small	Workforce Shortages Brain Drain	
No monitoring and evaluation of program and graduate quality	Proper planning	Perception of pharmacy as business	
Other health professionals handling medicines	Public Health Pharmacy	Pharmacy is losing relevance in the private sector	
Overtrained and Underutilized	Quality Assurance	Pharmacy profession is not well known in Nigeria	
Paradigm shift in pharmacy practice focus	Quality of internship centres and training	The politics of everything	
Parents influencing their children's career choice	Quality Medicines critical in healthcare delivery	Poor data management and record keeping	
Public-private Partnership	Research motivation, funding, quality and output	Poor maintenance culture	
Pharm D switch	Increased clinical exposure	Poor regulation of the profession, it	

9.7 Appendix 7: Ethics Approval Forms

University of Nottingham
UK | CHINA | MALAYSIA

School of Education
University of Nottingham
The Dearing Building
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

educationresearchethics@nottingham.ac.uk

23/01/2018

Our Ref: 2017/112

Dear Ifunanya Ikhile
CC Claire Anderson, Simon McGrath, Stephanie Bridges

Thank you for your research ethics application for your project:

NEEDS BASED PHARMACY EDUCATION IN THE CONTEXT OF A DEVELOPING COUNTRY: A MIXED METHODS STUDY

Our Ethics Committee has looked at your submission and has the following comments.

- This was a thorough application.
- The key ethical issues seem to have been addressed. A lengthy and detailed description of the project was supplied.

Based on the above assessment, it is deemed your research is:

- **Approved**

We wish you well with your research.

Dr Kay Fuller
Chair of Ethics Committee

+44 (0)115 9514470
educationadmin@nottingham.ac.uk
nottingham.ac.uk/education

National Health Research Ethics Committee of Nigeria (NHREC)

Promoting Highest Ethical and Scientific Standards for Health Research in Nigeria

Federal Ministry of Health

NHREC Protocol Number NHREC/01/01/2007-07/05/2019
NHREC Approval Number NHREC/01/01/2007- 08/07/2019
Date: 08 July, 2019

Re: Needs-Based Pharmacy Education in the Context of a Developing Country: A mixed Methods Study

Health Research Committee assigned number: NHREC/01/01/2007

Name of Student Investigator: Dr. Ikhile Ifunanya
Address of Student Investigator: Division of Pharmacy
University of Nottingham, East Drive
University park, Nottigham
Email: ifuananya.khile@nottingham.ac.uk

Date of receipt of valid application: 07/05/2019
Date when final determination of research was made: 08-07-2019

Notice of Expedited Committee Review and Approval

This is to inform you that the research described in the submitted protocol, the consent forms, advertisements and other participant information materials have been reviewed and *given expedited committee approval by the National Health Research Ethics Committee.*

This approval dates from 08/07/2019 to 07/07/2020. If there is delay in starting the research, please inform the HREC so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study.* In multiyear research, endeavour to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code.

The HREC reserves the right to conduct compliance visit to your research site without previous notification.

Signed

Professor Zubairu Iliyasu MBBS (UniMaid), MPH (Glasg.), PhD (Shef.), FWACP, FMCPH
Chairman, National Health Research Ethics Committee of Nigeria (NHREC)

Department of Health Planning, Research & Statistics
Federal Ministry of Health
11th Floor, Federal Secretariat Complex Phase I I
Ahmadu Bello Way, Abuja

Tel: +234-09-523-8567
E-mail: chairman@nhrec.net, secretary@nhrec.net,
desofficer@nhrec.net
URL: http://www.nhrec.net