

# ***Identifying and Evaluating Foundation and Advanced Pharmacy Practice Competencies in a Global Context***

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Thesis submitted in accordance with the requirements of UCL School of Pharmacy for the degree of  
Doctor of Philosophy

By

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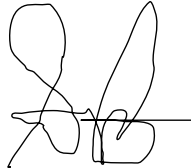


To Mum— you would have been proud.

## **PLAGIARISM STATEMENT**

This thesis describes research conducted at the UCL School of Pharmacy between April 2012 and August 2015, under the supervision of Professor Ian Bates. I certify that this research is original, and that any parts of the work that have been conducted by collaboration are clearly indicated. I also certify that I have written all the text herein and have clearly indicated by suitable citation any part of the dissertation that has already appeared in publication.

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## **EXECUTIVE SUMMARY**

Pharmacists play a key role in the delivery of essential health services. Evidence from published research suggests that the expertise of the health professionals involved in care delivery influences health system performance. Studies also show that the use of competency frameworks alongside standards of practice facilitates the improvement of professional performance and aids expertise development.

The research reported in this thesis aimed to identify and evaluate foundation and advanced level pharmacy practice competencies. Its first objective was to evaluate pharmacists' perception of relevance to practice of the competencies contained in the FIP Global Competency Framework (GbCF v1), focusing on countries in Africa. Its second objective was to identify and evaluate the competencies that are relevant for global advanced pharmacy practice.

The findings of an online cross-sectional survey of 469 pharmacists from fourteen African countries demonstrates that 90% of the foundation level pharmacy practice competencies contained in the GbCF v1 are relevant to practice. This finding validates the GbCF v1 as a mapping tool that can be used to develop country-specific frameworks for early career practitioners in the countries represented in this survey.

A systematic literature review and a content analysis of two national frameworks identified 64 competencies and 237 behaviours for advanced pharmacy practice. A panel of experts (n=14) from four of the six WHO regions developed consensus on these competencies and behaviours. Overall agreement via consensus showed that 89.5% of the content of the frameworks were broadly similar. A crossover mapping experiment involving advanced practitioners (n=42) from four countries showed within-subject agreement for matching competencies in the frameworks. This agreement was significant for 87% of the competencies ( $k \geq 0.25$ ;  $p \leq 0.05$ ). Subsequent semi structured interviews (n=17) showed the identified competencies were relevant to practice with general agreement obtained on similarity between the two frameworks. These findings demonstrate the existence of a core set of competencies that are applicable to advanced pharmacy practitioners from different countries.

The research reported in this thesis provides evidence that was previously lacking on the validity of the Global Competency Framework in specific countries in Africa. It also provides preliminary data on the competencies that are required for global advanced pharmacy practice. Overall, these findings provide valuable insights that can be developed through further research to serve as a driver for global policy.

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## ACRONYMS

ACCP	The American College of Clinical Pharmacy
ACPE	Accreditation Council for Pharmacy Education
AMED	Allied and Complementary Medicine Database
APPF	Advanced Pharmacy Practice Framework
APPFSC	Advanced Pharmacy Practice Framework Steering Committee
CCGT	Certificate of Completion of General Training
CCAT	Certificate of Completion of Advanced Training
CE	Continuing Education
CBET	Competency Based Education and Training
CoDEG	Competency Development and Evaluation Group
CPD	Continuing Professional Development
DOP	Direct Observed Practice
FIP	The International Pharmaceutical Federation □
FIPED	The International Pharmaceutical Federation □ Education Initiative
GbCF v1	Global Competency Framework □ version 1
GLF	General Level Framework □
GHWA	Global Health Workforce Alliance
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HMIC	Health Management Information Consortium
IOM	The Institute of Medicine
IQ	Intelligence Quotient
JPCT	Joint Partners Credentialing Task Group
NAPRA	National Association of Pharmacy Regulatory Authorities
NAPSAC	The New Zealand and Australian Pharmacy Schools Accreditation Committee □
NHS	National Health Service
MeSH	Medical Subject Headings
MDG	Millennium Development Goals
MKO	More Knowledgeable Other
MSF	Multi-Source Feedback
OSCEs	Objective Structured Clinical Examination
PSNZ	The Pharmaceutical Society of New Zealand
PSI	Pharmaceutical Society of Ireland
PSA	Pharmaceutical Society of Australia
RPSGB	Royal Pharmaceutical Society of Great Britain
RPS-FLF	Royal Pharmaceutical Society of Great Britain Foundation Level Framework
RPS-APF	Royal Pharmaceutical Society of Great Britain Advanced Level Framework
SDL	Self-Directed Learning
SPC	Singapore Pharmaceutical Council
SHPA	The Society of Hospital Pharmacists of Australia
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNITWIN	University Twinning and Networking Programme
WHO	World Health Organisation
ZPD	Zone of Proximal Development



## INTRODUCTION

Universal health coverage and equitable access to essential health services requires a workforce that is effective, efficient and capable of providing high quality care at all times to all patients. Evidence from published research demonstrates that the expertise of the health professionals involved in care delivery has an impact on the overall quality of care provided in the health sector (Campbell et al., 2013; Department of Health, 2000; World Health Organization, 2013).

Strengthening workforce capacity via education and training is recognised as a key strategy for ensuring a health workforce that is continuously fit for practice (World Health Organization, 2013). In line with this recognition, competency-based education and training (CBET) for both undergraduate and practicing health workers is advocated globally, and has been implemented in many countries around the world (Organisation for Economic Co-operation and Development (OECD), 2013).

Even though research into the effectiveness of CBET in the health professions is currently limited, published studies show the usefulness of competency frameworks— a key attribute of CBET— in the development of health professionals (Brownie et al., 2011a). Studies show that when the competencies essential for professional practice are identified, compiled to form a framework, and used alongside standards of practice, it aids improvement of performance and facilitates the attainment and maintenance of fitness to practise. It also assures consistency of practice and fosters continuing professional development (Antoniou et al., 2004; Austin et al., 2004; Brownie et al., 2011a; Coombes et al., 2011; Mills et al., 2005). Consequently, the use of competency frameworks to benchmark standards of practice and aid the identification of learning gaps and developmental needs have become features of professional practice in pharmacy and in the health professions globally (Bruno et al., 2010).

The International Pharmaceutical Federation Education Initiative, (FIPE*d*)— which is the pharmacy education development arm of the academic section of the International Pharmaceutical Federation (FIP)— has been at the forefront of advocacy for strengthening educational institutions, processes and collaborations for the development of the global pharmacy workforce (International Pharmaceutical Federation (FIP), 2013). FIPE*d* advocates

the need to identify the core competencies essential for pharmacy practice. The overall goal for this is to provide an infrastructure for global guidance on the practice-based expectations of the pharmacy workforce (Bruno et al., 2010).

FIPed acknowledges that no single framework or model adequately fits all practice contexts particularly in view of the variations that exist between countries. However, FIPed also recognises that a global framework of behavioural competencies that can be used as a mapping tool to create country-specific frameworks for pharmacy practice and professional development is beneficial and relevant (Bruno et al., 2010; FIP Education Initiatives, 2012; International Pharmaceutical Federation (FIP), 2013). In line with this goal, the FIP Global Competency Framework (GbCF v1) for foundation level pharmacy practice was developed in 2010 (International Pharmaceutical Federation, 2010). On-going validation of the GbCF v1 has so far demonstrated its competencies to be generally applicable to practice in 64 countries around the world (Bruno, 2011).

The research that was conducted and reported in this thesis provides details of two studies undertaken to identify and evaluate the core competencies required of the global pharmacy workforce. It gives specific details on the validation of the FIP Global Competency Framework (GbCF v1) in some countries in Africa. It also reports on a study designed to identify and evaluate the competencies required of the global advanced pharmacy workforce.

This thesis is divided into five chapters. Chapter one gives an overview of the role of the pharmacy profession in assuring care quality. It provides a review of professional development in pharmacy, competence and competency-based education & training in the health professions, the concept and development of expertise, and some relevant adult learning theories. Chapter two presents the outcome of a systematic literature review conducted for this research. It also includes the research questions, aims and objectives of the two studies reported in this thesis. Chapter three gives details of the study conducted to evaluate and validate the FIP Global Competency Framework (GbCF v1) in countries in Africa. The study conducted to identify and evaluate the advanced practice competencies required of the global pharmacy workforce is presented in chapter four while chapter five

provides the research conclusions including study strengths, limitations and the overall implications of the findings in relation to pharmacy practice.

## **Chapter 1 RESEARCH BACKGROUND**

### **1.1 The Global Health Workforce: An Overview**

Many countries in the world, particularly those in Sub-Saharan Africa and South East Asia, are critically lacking in number of physicians, nurses, midwives and other health workers including pharmacists (Campbell et al., 2013; World Health Organization, 2013, 2008). The African region with about a quarter (24%) of the global disease burden— including a high incidence of HIV/AIDS, malaria, tuberculosis and other infectious diseases; poor and inadequate access to essential health services; and high maternal & infant mortality rate— has only 3% of the world's health workforce (Campbell et al., 2013).

Recent data show that the number of health workers in Africa is still far below the current World Health Organisation (WHO) threshold of 59.4 per 10,000 population required to prevent avoidable maternal deaths (Campbell et al., 2013). In line with evidence from published research that have shown that health workforce density correlates with health outcomes (World Health Organization, 2007, 2006), available estimates suggests that many of the countries in the region have made limited progress towards attaining most of the health-related Millennium Development Goals (MDGs) (United Nations Development Programme, 2014).

Pharmacists, as the third largest health professional group, play a key role in the delivery of essential health services and medicines expertise. There is clear evidence that pharmaceutical care services provided by pharmacists positively influence and enhance the quality of care delivered in the health sector. It also has a positive impact on health improvement (Giberson et al., 2011). Therefore, pharmacists present an available human resource pool for health that can be harnessed to contribute to the global health agenda of universal coverage and equitable access to health services. Consequently, strengthening the capacity of the pharmacy workforce is an integral strategy for enhancing health system performance. This underscores the need for a capable and knowledgeable pharmacy workforce possessing the necessary skills relevant for population needs.

*'It is not all about numbers: the goal of universal health coverage requires a paradigm shift, going beyond a discourse on shortages but rather focusing more explicitly on the (...) quality and productivity of the health workforce'* [The Universal Truth: No Health Without a Workforce. Forum Report of the Global Health Workforce Alliance & World Health Organisation 2013, Recife, Brazil (Campbell et al., 2013; p. iv)].

### **1.1.1 Pharmacy practice and healthcare quality**

Patients, their families and health service funders expect to receive safe, reliable and consistent high standards of care at all times. This demand carries an ethical obligation for health professionals involved in care delivery to develop and maintain competence individually and collectively as a profession (Bates et al., 2004). The term 'high standard of care' suggests a care quality that exists in a continuum and while minimum acceptable standards do exist, the provision of the highest possible care attainable should be the goal of every health system (Manasse, 2003).

Vincent, Taylor-Adams and Stanhope (1998) identified six factors that influence the quality of care delivered in the health sector including organisational and management factors, the work environment, team factors, individual (staff) factors, tasks factors and patient characteristics. Even though it is clear that a number of factors contribute to the quality of care delivered in the health sector, an increasing body of evidence identifies patient harm arising from drug-related adverse events and human errors as important causes of morbidity and mortality (Department of Health, 2000; Design Council and Department of Health, 2004; Institute of Medicine, 2000; Wilson et al., 2012, 1995).

Medicines play an essential role in most disease preventive programmes and in almost all treatment plans (International Pharmaceutical Federation and World Health Organization, 2000). Medicines often have their therapeutic effects co-existing with unwanted and unintentional drug effects that cause harm to patients.

Pharmacists as the custodians of medicines play are particularly concerned with care quality as it relates to medication use, availability, affordability, safety and effectiveness (Ray and Breland, 2011). Emerging empirical evidence show that pharmacists minimise associated risks from drug use and in so doing contribute to the quality of care delivered in the health sector (Fairbanks et al., 2007; Giberson et al., 2011; Lada and Delgado, 2007; Zellmer, 2001).

In 1997, the WHO introduced the concept of a *seven-starred pharmacist* where a pharmacist is seen as a caregiver, communicator, decision-maker, teacher, life-long learner, leader and manager (World Health Organization, 1997). The International Pharmaceutical Federation (FIP) in 2000 adopted this concept in its policy statement on *Good Pharmacy Education Practice* and added another component: ‘a researcher’ (International Pharmaceutical Federation, 2000).

The complex body of knowledge, skills and experience that pharmacists require for effective performance in these different roles and the increasing requirement for professional accountability, rapid technological advancements in the health sector, and the changing population dynamics that have resulted in an increase in prevalence of chronic diseases, underscore the need for a robustly trained pharmacy workforce (Bates et al., 2004; Davies et al., 2004, 2002). It emphasizes the need for a workforce that is consistently competent, flexible and capable of performing up to the desired standards of practice at all times (Duggan, 2013).

### **1.1.2 Contemporary pharmacy practice**

Since the late 1970's, pharmacy practice has shifted from a focus on drugs and drug products to a patient-oriented practice model (Van Mil et al., 2004). The goal of practice in this later model is to provide care directly to patients to produce definite outcomes that improve quality of life (American Society of Hospital Pharmacists, 1993, p. 1). The pharmacist in this practice model is directly involved in the care process and accepts personal responsibility for the outcomes of care provided (Council on Credentialing in Pharmacy, 2010a).

As a result, the roles undertaken by the contemporary pharmacist have expanded and some role changes have also occurred. Traditional pharmacy roles like drug dispensing, distribution, compounding and supplies have also become redefined. For example, drug dispensing and prescription filling in most developed countries like the USA, Canada and United Kingdom are now largely automated with the use of robotic dispensing technology (Ray and Breland, 2011).

Support staff like the pharmacy technicians and pharmacy assistants have been co-opted and recognised as part of the skill mix of the pharmacy workforce. These support staff are now trained to carry out duties such as drug dispensing and prescription filling with the pharmacist serving in supervisory capacity in many instances. Other roles like manufacturing and compounding of pharmaceuticals have become largely automated and/or have been taken up by specialized and commercial pharmaceutical companies (Council on Credentialing in Pharmacy, 2010a).

Along with these changes, new areas of pharmacy practice have developed and the contemporary pharmacist is now increasingly being recognised as playing a key role in many specialised and advanced practice settings (Cooksey et al., 2002; Giberson et al., 2011). Evidence from fields of medical practice like nuclear medicine, ambulatory and primary care, emergency medicine and others, have shown clear benefits from the inputs of pharmacists (Giberson et al., 2011). The contemporary pharmacist is now involved in a team-based role alongside other health practitioners, the primary aim of which is to optimise patient safety and care quality.

This increasing need for pharmaceutical care services requires a pharmacy workforce that is capable, adaptable and continuously fit for purpose. It places a demand on the pharmacists to develop and advance in knowledge, skills and in up-to-date training relevant to practice context (Cooksey et al., 2002; Duggan, 2010). A white paper published by the Institute of Medicine show that professional practice consistent with current knowledge is a key factor influencing patient safety along the care process curve. This further emphasises the importance of the education and training activities of both 'would-be' and practicing health professionals (Institute of Medicine, 2000).

It highlights the importance of the education and training activities of undergraduate and practicing pharmacist and implies that these activities need to be clearly defined and elucidated. Such activities also need to be designed and delivered in a way that creates an avenue for professional development, and the continuous maintenance of competence and fitness to practice (Coombes et al., 2011).

*"The overall quality of the healthcare system that serves the public is ultimately dependent on the expertise, attitudes, behaviour and commitment of the individual health professionals and other staff who work within that system"* [The Department of Health (DoH) of the United Kingdom in its document: 'Trust, Assurance and Safety, the regulation of health professional in the 21<sup>st</sup> century' (2007; p. 14)].



## **1.2 The Concept of Competence**

The primary goal of professional pharmacy practice is to improve public health by the safe, effective and appropriate use of medicines (Council on Credentialing in Pharmacy, 2010a). Integral to assuring patient safety by health professionals is the concept of competence. Competence has been described in a number of ways and was initially articulated in relation to performance improvement and increased task efficiency in the fields of human resource management and work organisation (Boyatzis, 1982; McClelland, 1994; McCowan, 1998; Spencer and Spencer, 1993; Whiddet and Hollyforde, 2003).

According to Brownie and colleagues, the initial conceptualization of competence was carried out to fulfill two interrelated objectives: ‘a closer specification of job-related tasks performed as part of roles at work, and the rationalisation of the training system’ (Brownie et al., 2011a; p.31). Since its conceptualization in industry and organisational development, competence in the field of educational research and training has evolved from a single-element representing knowledge to a more complex model that includes expertise and the application of that which has already been learnt into everyday practice (Albanese et al., 2007).

### **1.2.1 Defining competence**

The term ‘competence’ stems from the Latin root word for *cognisance* or *responsibility* (Weinert, 1999). It is widely used in various fields of scientific discourse and often takes its meaning from the context in which it is applied. For instance, competence is used in the fields of immunology, biology, management, economics, linguistics and developmental sciences to give precise meanings that are unrelated (Weinert, 1999; Winterton et al., 2006). The heterogeneity in the meaning of competence and the fact that it finds use in everyday parlance has made it a challenging term to comprehensively define in a way that provides consensus in every field of discourse (Lingard, 2009).

Early definitions of competence and related terminologies were based on technical and vocational (skill-based) measures of performance (Bates and Bruno, 2008). For example, White (1959; p.318) used competence to describe those ‘personality characteristics that are

associated with superior performance and high motivation' while Elkin (1990) associated competence with job performance at the micro-level and described it as a high level managerial attribute. Kane used the term to refer to 'the degree to which an individual can use knowledge, skills and judgment associated with the profession to perform effectively in the domain of possible encounters defining the scope of professional practice' (Kane, 1992; p.31).

Other contemporary definitions of competence have been proposed. Kak and colleagues defined competence as 'the ability to perform a specific task in a manner that yields desirable outcomes' (Kak et al., 2001; p.3) while Epstein and Hundert defined competence in healthcare practice as 'the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served' (Epstein and Hundert, 2002; p.226). Boursicot et al., (2010; p.1) defined competence as 'what an individual is able to do in clinical practice' while the term has been used in the field of pharmacy education to refer to 'the overarching capacity of an individual to perform' (Bates and Bruno, 2008; p.21).

The existence of different definitions for competence is attributed to the many theoretical and epistemological assumptions distinct to the different contexts in which competence has been conceptualised (Winterton et al., 2006). As a result, competence could mean different things to different people depending on the context in which it is used or applied.

### **1.2.2 Component of competence**

Components that describe competence (Figure 1.1) as commonly seen in education and research literature in the health professions include *knowledge, skills, abilities and attitudes* based on values and judgment (Carraccio et al., 2002; Clifford and Plumridge, 2003; Delamare - Le Diest and Winterton, 2005; Fernandez et al., 2012; Ten Cate and Scheele, 2007; Winterton et al., 2006).



**Figure 1.1: Components of competence**

**Knowledge** as described by Winterton et al (2006; p.7), is a social-construct that arises as a result of an interaction between ‘intelligence (*defined as the capacity to learn*) and situation (*defined as the opportunity to learn*)’. Knowledge describes what a person understands. It involves both a theoretical and/or practical understanding of a concept or subject. It is embedded in facts, principles and procedures (Kak et al., 2001, p. 3). Knowledge can be acquired either through formal learning (for example, codified knowledge obtained in a formal learning environment) or through informal learning via practice and hands-on experience.

**Skill** refers to the learned capacity to perform pre-determined tasks. It is a function of acquired knowledge and the manner in which such knowledge is applied (Winterton et al., 2006). It is also defined as a ‘goal directed well-organised behaviour that is acquired through practice and performed with economy of effort’ (Winterton et al., 2006; p.7). Skill is a measure of expertise and often correlates to the wages and supervisory requirement of a worker. A highly skilled professional will be expected to require minimal supervision relative to a novice worker (Cowan, 1997).

**Abilities** on the other hand are the inherited or acquired attributes that an individual brings to a new task. Ability is acquired through previous experience in the specific domain of practice or in some instances it could refer to an inherited capacity to carry out some tasks. Abilities also involves reasoning, memory and those mental processes that are required for solving novel problems (Fernandez et al., 2012)

**Attributes** refer to the personal traits, behaviours or individual characteristics a worker requires to successfully perform a job-related task (Fernandez et al., 2012; Gonczi et al., 1990). Attributes are not necessarily part of the core knowledge or skill requirements of a job but are necessary for on-the-job success. They include such things as the knowledge of the professional practice and the ethical issues that border such practice. Attributes also include those intangible components of competence that cannot be formally taught but that are fostered and acquired through training with competent role models as well as through experience and personal growth (Fernandez et al., 2012).

### **1.2.3 The Lexicon of competence**

Competence allows a professional to identify and link knowledge, skills, abilities and attributes in a way that maintain standards of performance. A professional judged competent provides a guarantee to the society that he/she would be able to perform up to acceptable standards at all times. The various fields of discourse in which competence has been conceptualised as well as the different definitions and usage of the term has led to a number of debates around the concept and the exact meaning of competence-related terminologies (Delamare - Le Diest and Winterton, 2005; Winterton et al., 2006).

In some fields of practice, for example in personnel management, interest in the concept of competence is related to individual behaviours concerned with personnel efficiency. In this scenario, levels of performance are classified as being high or low with a goal towards seeking out attributes that differentiate superior performers from average performers, or between effective and ineffective performers (Boyatzis, 1982; Delamare - Le Diest and Winterton, 2005; McClelland, 1994; Spencer and Spencer, 1993).

Some authors have viewed competence in a job-related (functional) sense and are concerned with the successful completion of activities and tasks that make up specific jobs. This functional view of competence is concerned with on-the-job success and the execution of job roles according to prescribed standards of practice (Boam and Sparrow, 1992; Collins et al., 2000; Holton and Lynham, 2000; Smith, 1993; Snyder and Ebeling, 1992). Other authors have made no distinction between the job-related tasks undertaken by individuals and how individuals behave on the job. These authors describe competence as consisting of both the

successful completion of job tasks and the personal behaviours that influence such performance (Whiddet and Hollyforde, 2003).

A number of competence-related terminologies have also been proposed. Boyatzis used the term *competency* (plural *competencies*) to refer to ‘an underlying characteristic of a person that results in effective and/or superior performance’ (Boyatzis, 1982; p.97). Snyder and Ebeling (1992) on the other hand, used the term *competencies* to refer to the plural of competence while other authors like Smith (1993) and Boam & Sparrow (1992) used the term in relation to job-related competence. Spencer & Spencer defined competency as the ‘underlying characteristic of an individual that is casually related to criterion-referenced effective and/or superior performance in a job or situation’ (Spencer and Spencer, 1993; p.9). Burgoyne described *being competent* as the ability to meet the demands of a given job and *having competencies* as acquiring the necessary attributes that enable competent performance (Burgoyne, 1988).

Woodruffe (1991) described *areas of competence* as the various aspects of a job role that can be performed by an individual and competency as those specific but distinct behaviours that influence competent performance (Woodruffe, 1991). McBeath (1990) and Brown (1993) gave no distinction between *competence* and *competency* and used both terms as synonyms. In pharmacy education, the term *competences* and *competencies* have also been described: *competences* is used to refer to ‘the ‘functional’, the ‘what’ attached to competence while *competencies* (singular, ‘competency’) relate to the qualities of capability, the ‘how’ of competence’ (Bates and Bruno, 2008; p.31&32)

The lack of consensus in the definition of competence as well as the inconsistencies in the meaning of the various terminologies used in describing competence is recognised as a possible limiting factor in the advancement of competence-related discussions in the health professions (Brownie et al., 2011b; Rethans et al., 2002). It has been suggested these inconsistencies have limited the full integration of competency-based approaches for the development of education and training programmes in the health professions (Brownie et al., 2011a; Frank et al., 2010).

Winterton et al., (2006) noted that previous attempts to establish harmonised and coherent meaning to common competence-related terminologies were unsuccessful. Brownie and colleagues, however, urge clarifying the meaning of these terminologies in health professional education so as to ensure the achievement of a well-articulated educational policy goal that can be communicated to all stakeholders in the health sector (Brownie et al., 2011a).

In an effort to clarify the concept of competence and advance the medical profession, the Royal College of Physicians and Surgeons of Canada in 2009 convened a ‘theory to practice consensus conference’ of International Competency-Based Medical Education (ICBME) collaborators. One of the tasks of this group was to propose consensus definitions of competency-based education terms that will be useful to medical educators globally (Frank et al., 2010).

Table 1.1 gives the definition of competency-based terminologies as proposed by the ICBME collaborators.

**Table 1.1: Definition of CBME and related terms (Adapted from Frank et al., 2010)**

<b>Competence</b>
The array of abilities across multiple domains or aspects of physician performance in a certain context. Statements about competence require descriptive qualifiers to define the relevant abilities, context, and stage of training. Competence is multi-dimensional and dynamic. It changes with time, experience and setting.
<b>Competency</b>
An observable ability of a health professional, integrating multiple components such as knowledge, skills, values, and attitudes. Since competencies are observable, they can be measured to ensure their acquisition. Competencies can be assembled like building blocks to facilitate progressive development.
<b>Competency-based medical education</b>
An outcome-based approach to the design, implementation, assessment and evaluation of medical education programs using an organising framework of competencies.
<b>Competent</b>
Possessing the required abilities in all domains in a certain context at a defined stage of medical education or practice.
<b>Dyscompetence</b>
Possessing relatively less ability in one or more domains in a certain context at a defined stage of medical education and practice
<b>Incompetent</b>
Lacking the required abilities in all domains in a certain context at a defined stage of medical education and practice
<b>Progression of competence</b>
For each aspect or domain of competence, the spectrum of ability from novice to mastery. The goal of medical education is to facilitate the development of a physician to the level of ability required for optimal practice in each domain. At any given point in time, and in a given context, an individual physician will reflect greater or lesser ability in each domain.

The ICBME collaborators also proposed the concept of competence to be seen as a *multi-dimensional, dynamic, contextual and developmental* concept (Frank et al., 2010, p. 641). Accordingly, competence is a dynamic concept acquired over time through training and experience. It marks a milestone to be achieved in relation to a particular task, skill or knowledge (Frank et al., 2010; Fraser and Greenhalgh, 2001).

Based on the definitions outlined by the ICBME collaborators, the term *competent* is applied to someone who through experience increases in proficiency via a mix of initial professional training, on-the-job learning, instructional assessment and formal qualification (Frank et al., 2010). This definition recognises that competence can develop or recede over time as result of an individual's practice or learning environment (Frank et al., 2010).

### **1.3 Competence, Performance and Capability**

The terms *performance* and *capability* are used in a number of ways to connote competence in some literature (Fraser and Greenhalgh, 2001; Sherbino et al., 2008; While, 1994).

Performance is described as that observable part of competence or the resulting behaviour that arises from competence (Fraser and Greenhalgh, 2001; Kak et al., 2001; While, 1994). It is defined as the 'manner in which a practitioner has carried out a particular task or function' (Department of Health, 2006). It is also defined as 'the accomplishment of a given task measured against pre-set and known standards of accuracy, completeness, cost and speed' (BusinessDictionary.com, 2012).

Professional performance is defined as 'the quality of clinical practice in the workplace' (The Royal College of Pathologists, 2012). It describes what a professional actually does in real-life practice and reflects the knowledge, skills and experience a practitioner brings to his/her professional practice (Boursicot et al., 2010; Kak et al., 2001; Miller, 1990). It also encompasses those actions that can be observed and measured and deemed relevant for effective practice within an organisation (Kak et al., 2001).

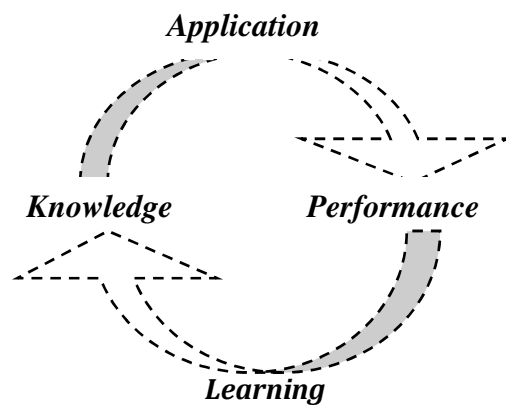
Professional performance in the healthcare professions is an important component affecting patient safety and the overall quality of care in the health sector (Bates and Bruno, 2008; Cooksey et al., 2002). Safe, effective and consistent performance should be the hallmark of all professional practice. Therefore, the measurement of performance carried out according to individual levels of proficiency should be the focal point in the regulation of health professionals (Bates and Bruno, 2008).

Professional performance is that part of competence that can be observed in a simulated or controlled scenario as well as in real life practice (Epstein and Hundert, 2002). Anecdotal



evidence and other research studies show that possessing the knowledge and ‘know how’ about a certain aspect of a job-related task does not always guarantee or imply successful on-the-job performance in daily practice (Frenk et al., 2010; McRobbie et al., 2006).

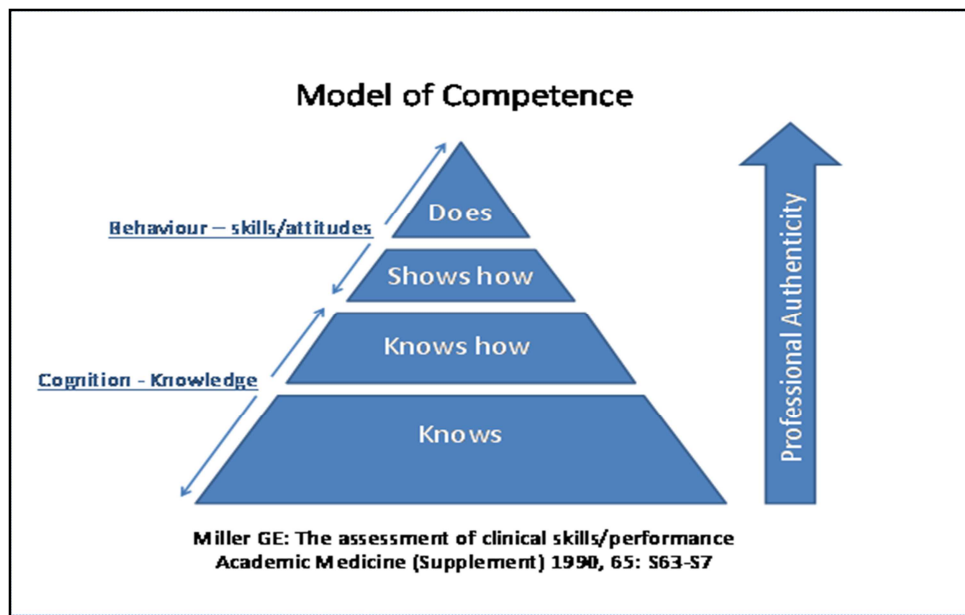
The knowledge/performance loop (Figure 1.2) describes the relationship between knowledge, its application and performance.



**Figure 1.2: The knowledge/performance loop (Adapted from Knoco Ltd®)**

Southgate and Dauphinee posit the relationship between competence and performance to be a complex one (Southgate and Dauphinee, 1998). A licensed pharmacist judged competent is expected to be able to carry out his/her professional duties up to the standards of acceptable practice. However, what this individual actually ‘does do’ in real life termed ‘performance’ will depend on a number of factors. As a result, competence being one of the many determinants of performance, does not always predict performance.

In distinguishing performance from competence, Miller in 1990 proposed a measure for assessing clinical competence based on levels of professional expertise. In the Miller’s pyramid (Figure 1.3) a clear distinction is made between cognition and actual performance. The lower two levels of the Miller’s pyramid illustrate the acquisitions of knowledge while actual performance in practice is illustrated by the upper two levels of the Miller’s pyramid.



**Figure 1.3: Miller’s pyramid for assessing clinical competence**

The first tier of the pyramid which is the ‘knows level’, involves the strict recall of facts, principles and theories that underpin professional practice at a given level. Possessing this knowledge however does not guarantee that a practitioner would be able to apply such knowledge in a way that ensures successful performance in practice (Epstein and Hundert, 2002). At the second tier of the pyramid, that is the ‘knows how’ level; a professional is able to integrate acquired knowledge with the skills and abilities required to solve problems or describe procedures (Epstein and Hundert, 2002). The ‘knows’ and ‘knows how’ levels of the Miller’s pyramid make up the cognition/knowledge level and is where novice practitioners usually sit.

The third and fourth level of the pyramid, the ‘shows how’ and ‘does’ level, are the stages of actual performance. These upper two levels are concerned with actual behaviour based on both knowledge and skills. For example, a novice mental health pharmacy practitioner (that is, a specialist in training), can possess the knowledge about mental health drugs (‘knows’ level); he/she may also ‘know how’ these drugs are to be administered in terms of dosage regimen and may be able to describe this knowledge succinctly (‘knows how’ level). However, the actual ability to integrate this specific knowledge into real-life practice, that is,

the 'shows how' level, where actual performance can be observed (the 'does' level), is termed performance.

Capability is another term commonly associated with competence. Capability is defined as 'the extent to which individuals can adapt to change, generate new knowledge and continue to improve their performance' (Fraser and Greenhalgh, 2001; p.799). Fraser and Greenhalgh (2001) argue that capability should be considered to be more than competence. It should be seen as existing in a continuum from a low to high level. It also would depend on the level of knowledge, skill, training and experience of an individual.

#### **1.4 Competency-Based Education and Training (CBET)**

According to McCowan (1998), the competency-approach to education and training has its roots in the theories of scientific management by Frederick Taylor, behaviourism by Edward Thorndike, and John Dewey's theory of progressive education.

CBET focuses on the desired performance characteristics that professionals are expected to acquire and then goes on to establish the measurable and observable metrics that determine those characteristics (Frank et al., 2010; Leung, 2002; Schilling and Koetting, 2010).

*In a sense, CBET begins with the end in mind; 'it consists of the functional analysis of occupational roles, translation of these roles into outcomes, and the assessment of trainee's progress on the basis of their demonstrable performance' (Leung, 2002; p.693).*

Traditional educational models begin with the determination of the knowledge which the learner needs to acquire and how this knowledge will be imparted. CBET on the other hand, is organised around the task analysis of future roles and the determination of the abilities needed by professionals to perform effectively in those roles (Gruppen et al., 2010; Leung, 2002).

These abilities are then organised as competencies that are further portrayed in terms of their building blocks. Then, working backwards, milestones that the learner will need to attain as these competencies are acquired are identified (Frank et al., 2010). Appropriate methods of instruction and assessment can thereafter be selected to facilitate the development of these competencies and to measure the progress of the learner as each milestone is attained (Carraccio et al., 2002; Frank et al., 2010; Voorhees, 2001).

CBET is employed extensively in vocational and technical training of workers in Europe, the USA, Canada and Australia. In the USA, competency-based training was initially utilised in teacher education in the mid-1960's and early 1970's amid concerns of poor student

performance and inadequate teacher training programs (McCowan, 1998; Schilling and Koetting, 2010; Spady, 1977). In Europe, CBET was promoted in the 1980's in vocational education and training in a bid to develop a workforce that was competitive in the global economy (Winterton et al., 2006).

In 1990, the Society of Teachers of Family Medicine initially introduced a comprehensive CBET model in medical education in the USA (Frank et al., 2010). In the past three decades, CBET has gained popularity in medicine and other healthcare disciplines particularly in relation to the recognition of the potential relevance of this approach to the increasing need for accountability, efficiency, cost-effectiveness, quality improvement and flexibility of the health workforce (Brownie et al., 2011a; Schilling and Koetting, 2010) .

The pharmacy profession has also advocated the use of competency-based approaches in the education and training of would-be and practising pharmacist (Bates and Bruno, 2008; Clifford and Plumridge, 2003). CBET is actively promoted as a key approach towards assuring the development of a high quality pharmacy workforce (Bates and Bruno, 2008; Bruno et al., 2010).

#### **1.4.1 Rationale and limitations of competency-based education and training**

In an analysis of the rationale for the use of competency-based education in medical education, Frank and colleagues list four major principles that justify its use. These include:

- **A focus on outcomes:** Reports have identified a non-alignment of professional competencies acquired by practitioners in the health sector with the changing needs of the population (Frenk et al., 2010; National Research Council, 2003). Advocates of CBET argue that the use of the competency approach, which focuses on the resulting outcomes of education, ensures that graduates learn and acquire competencies that are directly relevant to future roles (Albanese et al., 2007; Gruppen et al., 2012, 2010; Voorhees, 2001). It also ensures that competencies in all domains identified as being essential for practice are attained (Brownie et al., 2011a; Neufeld et al., 1993).

- **An emphasis on abilities:** Proponents of CBET criticise objective-based approaches used in traditional education models for over-emphasising knowledge at the expense of other components of competence such as skills, attitudes and attributes based on values and judgements (Frank et al., 2010). They argue that CBET model ensures that the learning curriculum is organised around competencies that can be tailored to learning needs (Voorhees, 2001). This provides an integrated learning experience that continuously takes into account prior learning elements, ensuring that health professionals are better equipped to serve successfully in their future roles (Carraccio et al., 2002; Frank et al., 2010; Gruppen et al., 2012, 2010).

- **A de-emphasis on time-based training:** Learning objectives in the traditional education model are time-bound and do not take into account individual variability in 'time-taken' to attain a specific competency (Frank et al., 2010). Proponents of CBET argue that a curriculum which is flexible in relation to the period of time taken to attain a competency maybe more efficient and engaging compared to a stringent time-based curriculum (Carraccio et al., 2002; Gruppen et al., 2010). This de-emphasis on time as a marker of competency ensures that transitions between various levels of practice are based solely on providing evidence of having attained the required competencies to perform at that level of practice, regardless of the time spent in doing so. The individualised learning process in CBET ensures that judgments on the performance of an individual can be carried out by an assessor independent of the performance of other learners (Gruppen et al., 2012; Long, 2000).

- **Promotion of learner-centeredness:** A CBET curriculum arguably provides clearly defined goals tailored into achievable milestones (Leung, 2002). Using these milestones, learners on a CBET program are potentially able to take responsibility for their progress and development and can adjust their learning accordingly (Frank et al., 2010). This provides a transparent pathway for achieving competencies by both the learner and facilitator and thereby promotes a focus on the learner's own development (Carraccio et al., 2002; Frank et al., 2010).

Even though CBET has been actively pursued and advocated in the education of health professionals, a number of criticisms have been leveled against this approach:

- Critics of CBET argue that breaking down competencies into discrete observable behaviours may lead to the creation of an endless list or check-list of behaviours that are ill-defined, complex and time consuming (Leung, 2002). They argue that this could lead to frustration on the part of both the learner and the teacher (Gonczi et al., 1990).

- Designing and implementing a CBET program involves the functional analysis of occupational roles to identify the competencies and the building blocks required for success in that role (Albanese et al., 2007). Leung (2002) in a critique of CBET highlights the difficulty in identifying all the competencies, behaviours and relevant knowledge that truly and adequately cover all future work roles. This factor, Leung argues, limits the feasibility of CBET in medical education as it can lead to a reduction in the knowledge content of any curriculum developed from a CBET approach. Other authors have also argued that atomising these competencies into units of observable behaviours is fraught with difficulties and reductive in nature (Talbot, 2004).

Nonetheless, proponents of CBET argued that this limitation represents operational difficulties that can be overcome through constant reviews and feedbacks from the end-users (Obiols, 2008). Contemporary notions of CBET in health professional education have also attempted to overcome this limitation through the development of frameworks containing core competencies (Brownie et al., 2011b; *The Draft CanMEDS 2015 Physician Competency Framework - Series IV*, 2015). These core competencies, which are developed from a needs-based assessment of society needs, are often dynamic and subject to change in accordance with changing population needs.

- The CBET approach has also been criticised for emphasising discrete observable behaviours and ignoring the complex interplay of contextual, social and cultural factors that often dominate real-life professional practice (Leung, 2002). Hyland in 1993 acknowledged that the assessment of competence is not value free. Nonetheless, the competency approach has still been proven to be a valuable for practitioner development as well as ensuring fitness to practice (Antoniou et al., 2005, 2004; Bates et al., 2004).

- The functional analysis of future job roles in CBET is often carried out based on the assumptions of uniformity in the way that professionals carry out job-related tasks. Gonczi

argues that some discrete tasks associated with professional work can be carried out satisfactorily using different methods as a result of experience. Therefore, an over-emphasis on specific methods or standards of performance for certain tasks, which is a common feature of many CBET models, maybe problematic and limiting (Gonczi et al., 1990; Talbot, 2004).

Proponents of CBET argue that while this limitation held true for the early conceptions of competence where measures of competence were based on vocational performance; this is no longer the case for contemporary CBET approaches. For example, in the health professions, competencies are delineated in terms of expected outcomes and not based on vocational skills thereby negating a strict adherence to specific methods of performance (Hill et al., 2006; *The Draft CanMEDS 2015 Physician Competency Framework - Series IV*, 2015).

- Critics have also argued that the use of a checklist of behaviours and milestones maybe superficial and could be demotivating to learners. They reason that CBET encourages learners to focus on the successful completion of tasks and the attainment of distinct milestones. These milestones, they argue, are often based on minimum acceptable standards and therefore may not promote critical thinking, a strive for excellence, and the development of expertise on the part of the learner (Gonczi et al., 1990; Leung, 2002).

Proponents have however argued that while this feature was common in traditional vocational conceptions of competence, contemporary competency-based approaches and competency frameworks are designed based on acceptable standards. Therefore, competency-based education using appropriate competency frameworks in the right context, can provide a route-map towards the attainment of expertise and excellence in practice (Bates and Bruno, 2008; Coombes et al., 2011).

#### **1.4.2 Competency frameworks**

Competencies refer to the knowledge, skills, attitudes and behaviours, which an individual requires to practice up to acceptable standards. A collection of competencies and their corresponding behaviour(s) is called a competency framework.

A competency framework provides a map of the competencies valuable for performance in an organisation (Brownie et al., 2011a). Competency frameworks generally contain similar



elements organised in the same way. Related competencies and their corresponding behavioural descriptors are grouped into cluster. The competency clusters are the highest elements of the framework while the behavioural indicators are the baseline elements (Whiddet and Hollyforde, 2003).

#### ***1.4.2.1 Development of competency frameworks***

There are three approaches commonly employed in the development of competency frameworks (Wright and Morgan, 2012). These are:

- i. The work-orientated approach,
- ii. The worker-orientated approach and
- iii. The multi-method-orientated approach

The work-orientated approach involves the functional analysis of professional roles with a goal towards identifying areas of practice that are central to job performance. Areas of practice are broken down into roles that are further divided into the specific tasks required to perform such roles. These tasks are then divided into sub-tasks. The work-orientated approach is particularly useful if practical tasks are a major part of the job role. It also enables the easy identification of levels of competence. A limitation of this method, however, is the possibility of creating a lengthy checklist of competencies that may be difficult to manage and assess (Gonczi et al., 1990; Wright and Morgan, 2012).

The worker-orientated approach focuses on identifying the general attributes that practitioners require to perform effectively in their job roles. It specifies competence in terms of its components, and assesses competence based on the demonstration of pre-defined competency attributes. This approach has been criticised for often being based on a small number of competencies necessary for practice (so called core competencies). Consequently, it is possible in this method, to ignore or overlook specific competencies that may actually be important to a particular job role (Gonczi et al., 1990; Wright and Morgan, 2012).

Multi-method-orientated approach attempts to integrate the work- and worker-orientated approach by linking job roles, tasks and sub-task of professional practice with the general attributes of the practitioner (Wright and Morgan, 2012).

#### *1.4.2.2 Competency frameworks in pharmacy*

A preliminary scoping Internet search using the key words 'competency frameworks' and 'practice standards' in the healthcare professions returned an extensive array of published literature. The search showed a number of frameworks developed and available for medicine, nursing, pharmacy, public health, physiotherapy and other allied health professions. The keyword word search also yielded a number of national and organisational level competency frameworks for pharmacy practice in Australia, Ireland, United Kingdom and New Zealand. A 2012 and 2014 survey of the FIP member organisations by *FIPed* also identified other competency frameworks for pharmacy practice from Canada, USA, Thailand and Singapore.

Examples of these include frameworks that delineate the competencies required for early career practitioners in United Kingdom [the RPS Foundation Level Framework (RPS-FLF) developed by the Royal Pharmaceutical Society of Great Britain (RPS)], Australia [the National Competency Standards Framework for Pharmacists in Australia developed by the Pharmaceutical Society of Australia (PSA) with the aid of the RPS-FLF], New Zealand [Competency Standard for the Pharmacy Profession Framework developed by the Pharmacy Council of New Zealand (PCNZ)], Canada [Professional Competencies for Canadian Pharmacists at Entry to Practice developed by the National Association of Pharmacy Regulatory Authority (NAPRA)], Singapore [Competency Standards for Pharmacists in Singapore developed by the Singapore Pharmacy Council (SPC) with the aid of the RPS-FLF] and Ireland [Core Competency Framework for Pharmacists in Ireland that was developed by the Pharmaceutical Society of Ireland (PSI) with the aid of the RPS-FLF].

These frameworks describe the professional practice profile of early career pharmacists and are primarily used to design the training programme for initial registration in pharmacy in the respective countries (National Association of Pharmacy Regulatory Authorities, 2014a; Pharmaceutical Society of Australia, 2010; Pharmacy Council of New Zealand, 2011;

Singapore Pharmacy Council, 2011; The Pharmaceutical Society of Ireland, 2013; The Royal Pharmaceutical Society of Great Britain, 2014). Others include the Model Standards of Practice for Canadian Pharmacists, which defines the practice standards against which the performance of pharmacists may be judged and assessed by the regulatory authorities (National Association of Pharmacy Regulatory Authorities, 2009), and the New Zealand National Pharmacists Services Framework which aligns the PCNZ competency standards to the specific roles and responsibilities provided by pharmacists in New Zealand (District Health Board of New Zealand, 2007).

Two other national frameworks called the Advanced Pharmacy Practice Framework (The Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012) and the RPS Advanced Pharmacy Framework (RPS-APF) (Royal Pharmaceutical Society of Great Britain, 2013a) have also been developed for advanced pharmacy practitioners in Australia and United Kingdom respectively. The American College of Clinical Pharmacy have also developed a framework, the Clinical Pharmacist Competencies Framework, that delineates the knowledge and skills that specialists clinical pharmacists require to practice up to acceptable standards (American College of Clinical Pharmacy, 2008a)

On a global level, the FIP Global Competency Framework (GbCF v1) has been developed and it delineates the competencies and corresponding behavioural indicators required for global foundation level pharmacy practice (International Pharmaceutical Federation, 2010). This framework has undergone a number of expert reviews and validation via consensus methodologies and is currently undergoing further validation through an online survey of pharmacists practicing in different countries around the world.

In general, competency frameworks are used extensively in pharmacy practice to benchmark standards and accreditation, design and develop undergraduate and post graduate training curricular, regulate career entry and support career progression. Chapter 2 of this report presents a systematic literature review conducted to evaluate the methodologies used to develop competency frameworks in pharmacy. The literature review also presents evidence on the effectiveness of such frameworks in pharmacy.

## **1.5 The Concept of Expertise**

The overall quality of care delivered in the health sector is dependent on a number of factors, one of which is the expertise of the health professionals involved in care delivery (Department of Health, 2007). It is therefore an evident expectation that practitioners in the health sector develop and advance towards attaining expert levels of practice in their fields (Obiols, 2008).

One of the critiques of the competency approach to professional education has been its perceived limitation in promoting the development of expertise (Gonczi et al., 1990; Leung, 2002). An understanding of the nature of expertise and its various components can provide a background for the development of education and training programs that actively promote practice progression and expertise development.

An understanding of the nature of expertise and how this level of practice might be actively pursued and achieved is therefore important (Dunphy and Williamson, 2004; Schmidt and Boshuizen, 1993). Furthermore, clear understanding of the nature of expertise in the health professions can provide a framework for planning optimal service delivery at all levels of practice.

### **1.5.1 Defining expertise**

Expertise broadly refers to knowledge, skills or abilities used in performing specific tasks in a given domain (Farrington-Darby and Wilson, 2006). The term is also used to refer to the quality of the output of professional performance, for example, the quality of the decision taken by an expert practitioner. Other authors have used the term to refer to the process through which professional performance is undertaken and the mechanisms that underlie such superior performance (Ericsson, 2000).

### **1.5.2 Expert vs. novice practice**

An expert is an individual who has attained a level of superior performance through training, experience or extensive practice in a given domain. An expert is widely recognised by his/her

peers and the general public as a person who is a reliable source of knowledge, skill and technique. They are also seen to be capable of judging rightly and wisely within their domain of expertise (Dunphy and Williamson, 2004).

A novice generally refers to an individual who is new to a field of practice or one whose practice is at the beginner level (Patel, et al., 1999). It could also refer to an individual who lacks extensive knowledge, skills or practical experience in their domain of practice (Dunphy and Williamson, 2004). Novices differ from experts in terms of their depth of knowledge, experience and ability to apply theoretical or generic knowledge in solving problems (Gilhooly, 1990). Existing literature on medical expertise have broadly differentiated between expert and novice practitioners in terms of their level of experience with reference to differences in cognitive processes and skills (Cuthbert et al., 1999; Hoffman, 1996).

Experts can be distinguished from novice practitioners in relation to the level of proficiency attainable in a given domain. Levels of proficiency can be measured in terms of academic and professional qualifications, professional status or peer recognitions, experience and length of practice in that domain (Chi, 2006; Hoffman, 1996; Manley and Garbett, 2000). Some studies differentiate between *novice*, *intermediates*, *sub-experts* and *expert* practitioners (Patel, et al., 1999). Intermediates are seen as individuals who still possessed generic knowledge or skill in a given domain of practice, even though, their practice maybe above the beginner level (Boshuizen and Schmidt, 1992; Cuthbert et al., 1999; Patel, et al., 1999). Examples of intermediates include medical residents and interns. Sub-experts include individuals who possess significant generic knowledge across a field of practice but lack adequate specialised knowledge in that field (for example, specialists in training). Sub-experts could also refer to an individual who is an expert in a different but related field of practice; for example, a cardiologist solving an endocrine problem (Patel et al., 1994). Another study categorised experts as *basic-experts* and *super-experts*. Super-experts referred to the 'top experts' in a specialised field while basic-experts are those with expert knowledge but lesser practical experience in their field of practice (Raufaste et al., 1998).

### 1.5.3 Absolute and relative expertise

Research into the nature of expertise is based on two broad conceptions of expertise:

- Absolute or exceptional expertise and
- Relative expertise

Pioneering studies of expertise involved the identification and assessment of individuals whose performance in their given domain of practice were deemed to be exceptional (Chi, 2006). This view of expertise, termed absolute expertise, sees expertise as a status that is already attained. Studies of absolute expertise are associated with the critical assessment of expert behaviour with a goal towards understanding how such individuals performed in their domain of practice (Chase and Simon, 1973; de Groot, 1965, 1946; de Groot and Gobet, 1996; Ericsson et al., 2007; Newell and Rosenbloom, 1981). These studies sought to establish the characteristics that distinguished expert performers based on the tacit assumption that expert performance arises as a result of an innate superiority in abilities or talents (Alderson, 2010; Bloom, 1985; Chi, 2006).

The studies were conducted in fields where objective measures of expert performance were readily available; notably, in the game of chess where expert performance is measurable using the *Elo* scale (Chase and Simon, 1973; de Groot, 1946; de Groot and Gobet, 1996; Simon and Chase, 1973). Studies of absolute expertise were also conducted in sports, music and arts— where a clearly defined criteria for measuring expert performance exists (Baker et al., 2003; Ericsson, 2000, 1996; Taylor, 1975)

Relative expertise does not view expertise as an absolute endpoint or status, but as a journey that can be undertaken by less proficient practitioners in order to develop their practice over the course of a professional career (Alderson, 2010; Chi, 2006). In this view, experts are defined in relation to their proficiency levels when compared with novice practitioners (Patel, et al., 1999; Patel and Groen, 1991). For example, experts and novice practitioners may be differentiated based on their depth of knowledge with the experts group defined as the more knowledgeable persons in a particular domain while the less knowledgeable group of individuals are called novices (Chi, 2006).

The goal of research in the study of relative expertise is to compare and contrast expert and novice performance in the same domain and on the same task. The aim is to understand the processes that underpin each type of performance and identify the factors that influence expert and novice performance (Chi, 2006).

Research on medical expertise have been conducted in the fields of nursing, anaesthesiology, radiology and medicine (Cuthbert et al., 1999; Eraut and Boulay, 2001; Schmidt and Boshuizen, 1993). These studies were based on the concept of relative expertise (Cuthbert et al., 1999; Eraut and Boulay, 2001) and involved the analysis of expert performance in select tasks, compared to novice practitioners (Alderson, 2010; Arocha and Patel, 1995; Boshuizen and Schmidt, 1992; Hobus et al., 1987; Lesgold et al., 1988; Patel and Groen, 1991; Raufaste et al., 1998; Schmidt and Boshuizen, 1993). Others involved the study of knowledge organisation and decision-making processes of expert practitioners (Crandall and Getchell-Reiter, 1993; Elstein et al., 1978; Elstein and Schwarz, 2002; Gale and Marsden, 1983; Xiao et al., 1997).

#### **1.5.4 Characteristics of expertise**

Pioneering studies of expertise initially suggested that experts possessed higher levels of cognitive functions like superior memory, intelligence and superior powers of speed (Chase and Simon, 1973; de Groot, 1946; Simon and Chase, 1973). These attributes were assumed to be the factors that distinguished expert performers and were also thought to be generalisable to experts in other domains.

Further research however proved most of the specific characteristic attributes of expertise observed therein to be domain specific (Ericsson, 2000; Ericsson and Lehmann, 1996). For example, in a study of the characteristics of elite chess players, the superiority of an expert chess player's memory was found to be limited to regular chess positions and did not extend to the ability to recall random positions. This superiority in memory recall was also not replicable in other domains of practice where the experts had no experience (Chase and Simon, 1973; Djakow et al., 1927; Ericsson, 2000; Simon and Chase, 1973).

Ceci and Ruiz (1992) studied the characteristics of experts practising in sport and found that the superior performance demonstrated by a particular group of experts did not extend to other domains of practice where the same sets of skills and levels of cognitions were required (Ceci and Ruiz, 1992; Farrington-Darby and Wilson, 2006). Doll and Mayr (1987) found that high intelligence quotients (IQ) did not correlate with superior performance and did not distinguish between novice and expert performers in a particular field of practice (Doll and Mayr, 1987). The findings of the Doll & Mayr study confirmed the results of an earlier study conducted by Taylor in 1975 which showed that IQ did not correlate with creative abilities among expert artists and scientists when compared with novice practitioners in the same field (Taylor, 1975).

Another study by Ceci and Liker (1986) showed that expert reasoning did not correlate with general intelligence, rather, such reasoning tapped from the skills developed by these experts through experience (Ceci and Liker, 1986). These examples show the relative independence of expertise on general abilities, superior memory and innate cognitive abilities like intelligence (Ericsson et al., 2007).

In a review of the influence of general basic capacities on performance in elite practice, Ericsson and Lehman in 1996 found that measures of general capacities like visual acuity, memory recall and reaction time, did not predict successful performance in a given field of practice. The higher levels of performance observed in experts were shown to be dependent on specific attributes acquired through experience and extensive practice in their fields of practice (Ericsson, 2000; Ericsson et al., 1993; Ericsson and Lehmann, 1996).

Even though the findings of the early studies of expertise were difficult to generalise for a number of reasons including the highly specific study population and quasi-experimental methods used in the design; a number of themes associated with the nature of expertise did emerge (Ericsson et al., 2007). Factors like perception and pattern recognition, experience and extensive practice, structure and organisation of expert knowledge, and expert training and coaching were all found to contribute to expert performance (Dunphy and Williamson,



2004; Ericsson, 2000, 1996; Ericsson et al., 2007; Gilhooly, 1990; Hoffman, 1996; Schumacher and Czerwinski, 1992).

These characteristics have also been delineated by studies of medical expertise (Alderson, 2010; Eraut and Boulay, 2001; Hoffman, 1996; Patel et al., 1994; Schmidt and Boshuizen, 1993). Table 1.2 gives a summary of the characteristic features of expert performance as proposed by Dunphy and Williamson (2004).

**Table 1.2: Characteristics of expertise (Adapted from Dunphy and Williamson, 2004)**

<b>Characteristics</b>	<b>Description</b>
<b>Pattern recognition</b>	Able to recognise complex patterns
<b>Knowledge</b>	Possess high levels of declarative and procedural knowledge Expert knowledge is organised and reflective of a deep understanding of context Possess knowledge conditionalised on a set of circumstances. Can flexibly retrieve knowledge with little attentional effort
<b>Skills</b>	Performance of skills may be automatic
<b>Cognitive space</b>	As knowledge becomes automated, additional cognitive space is available for deliberation
<b>Metacognition monitoring</b>	Able to skilfully and/or automatically monitor situations holistically
<b>Teaching ability</b>	Not necessarily good teachers
<b>Flexibility</b>	High levels of contextual flexibility Can consider more possibilities than average practitioner Varying levels of flexibility in approaches to new situations

### **A) Perception and pattern recognition**

Perception and pattern recognition are cognitive abilities found to be crucial features of expert performance. Perception refers to the unified awareness of a given environment through the organisation, identification and interpretation of stimulus obtained from sensory processes with an aim towards representing and understanding that environment (Johns and Saks, 2008).

Pioneering work by de Groot in 1965 provided initial evidence on the influence of perception on expert performance (de Groot, 1965; de Groot and Gobet, 1996).

When compared to novices, experts were shown to be able to perceive meaningful patterns holistically. Experts had the ability to perceive domain-specific elements in parallel with the relational elements of a given situation, unlike novices who perceived them serially (Ericsson, 2000; Gilhooly, 1990; Johnston, 2005). This ability to perceive meaningful patterns is termed *pattern recognition* and is the feature which enables experts to rapidly

recognise the key attributes of a given problem with a resultant effect of rapid decision-making (Lesgold et al., 1988; Patel and Groen, 1991; Xiao et al., 1997).

Perception and pattern recognition has also been demonstrated in medical expertise and arises from experience. Available evidence show that these two features of expertise influence clinical reasoning, problem solving and rapid decision-making in clinical practice (Eraut and Boulay, 2001; Patel, et al., 1999; Pelaccia et al., 2011).

## **B) Expert knowledge, its organisation and structure**

Experts possess specialized domain specific knowledge relevant for superior performance in their field of practice (Hoffman, 1996). The exclusivity and highly specialised nature of expert knowledge correlates with the increasing complexity of the task they perform in their area of expertise (Johnston, 2005). Expert knowledge differ in terms of the quantity of knowledge accumulated through experience and the way this knowledge is organised and structured (Hoffman, 1996; Schmidt and Boshuizen, 1993).

Experts are able to use working and long term memory to store and retrieve information encoded around key features of domain-specific principles and solutions (Ericsson, 2000). Novices on the other hand, have limited knowledge and this knowledge is encoded around basic domain-specific first principles (Ericsson, 2003). This makes the reliable retrieval knowledge by novices even more difficult when solving novel or complex problems (Eraut and Boulay, 2001; Patel et al., 1994).

Experts exhibit superior but dynamic mental cause-effect knowledge models that represent entities, events, properties and functional relations of domain specific elements (Boshuizen and Claessen, 1985; Hoffman, 1996; Larkin, 1983; Schumacher and Czerwinski, 1992). The dynamic and superior quality of these mental representations allow for contextual and content dependent knowledge adaptation and flexibility, leading to rapid and intuitive problem solving with a resultant superiority in performance (Gilhooly, 1990; Lesgold et al., 1988; Patel, et al., 1999). This attribute also allows for the assimilation, re-organisation and storage of accumulated knowledge for future retrieval.

The ability to use stored information to solve problems is observed in medical expertise, where expert practitioners are able to rapidly retrieve prior domain-specific knowledge to solve related problems in their domains (Allen et al., 1988; Gilhooly, 1990; Schmidt and Boshuizen, 1993). When compared to novice practitioners, medical experts are able to solve problems using *forward reasoning*. Forward reasoning refers to the process of drawing inferences from available data and using those inferences to simultaneously move towards the solution of the problem (Larkin et al., 1980; Patel, et al., 1999).

Expert problem solving is also *schema-driven*. This means, experts are able to combine domain-specific scientific knowledge with the practical knowledge they acquire through experience. They use these two forms of knowledge to hone in on cues present in a given problem for rapid decision-making (Didierjean and Fernand, 2008; Gale and Marsden, 1983; Gilhooly, 1990; Patel, et al., 1999). This ability is largely unconscious although the end product is reflected upon and regulated by conscious deliberations (Eraut and Boulay, 2001). In contrast to experts, problem solving in novice practice is *search-driven*, in that novices reason backwards by using scientific first principles to reach a solution to a problem. As a result, decision making in novice practice is slow and not fluid.

### **C) Experience and deliberate practice**

Extensive experience and training in a given domain of practice is often assumed to lead to improved performance. Although, this improvement has been shown empirically to occur in the early years of initial practice in a given domain, a number of studies have shown the existence of a time bound limit on performance (Ericsson et al., 1993).

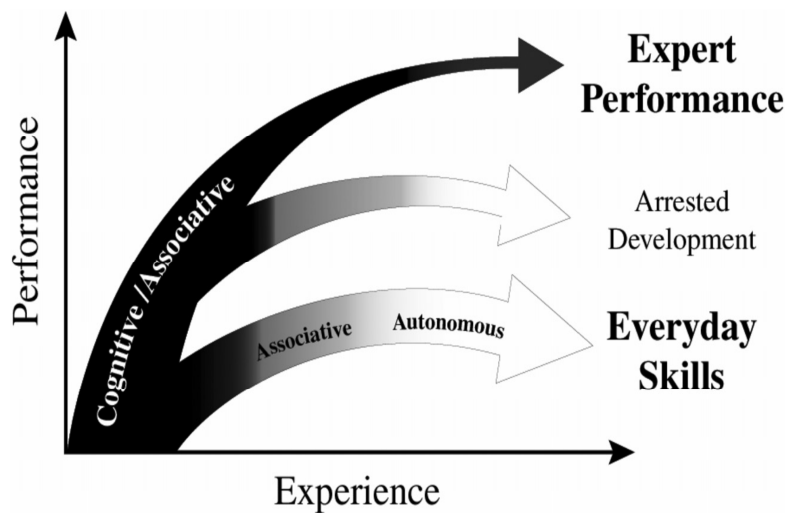
In 1981, Newell and Rosenbloom proposed the *power law of practice* which posits that learning occurs at a rapid rate upon the onset of practice but declines over time with continued practice (Newell and Rosenbloom, 1981). Research into the nature of expertise has demonstrated the veracity of this law (Baker et al., 2003). Studies show that improvement in performance arises as a result of the accumulated effects of prolonged practice and/or increased learning. This monotonic increase in performance occurs according to a power function. After sometime, when an acceptable level of proficiency has been attained,

continuous performance improvement may not be tangible or noticeable (Baker et al., 2003; Ericsson, 2006; Ericsson et al., 1993).

Other studies show that novice practitioners are able to improve their practice through experience and supervision. After sometime, usually within a few months and less than a year of practice, novice practitioners attain a certain level of rule-based proficiency. Additional experience and with further practice in routine activities, usually within 2-3years, a level of competence is attained where practice is up to the minimum acceptable standard and becomes mostly independent. Thereafter, further improvement in performance appears to be unpredictable with practitioners able to maintain a stable but average level of performance (Ericsson, 2004).

At this stage, performance becomes largely automated, routine and requires little effort. Most practitioners are able to maintain this pedestrian level of practice throughout their career, a phenomenon that is tagged *arrested development* as shown in Figure 1.4 (Ericsson, 2004). In order to overcome the phenomena of arrested development associated with automaticity, aspiring expert practitioners must actively seek out more demanding tasks with appropriate levels of challenge beyond their current levels of proficiency (Ericsson, 2006). This kind of practice, termed *deliberate practice*, is what stimulates continuous learning and further improvement in performance (Ericsson, 2006, 2004; Ericsson et al., 2007).

Ericsson proposed the *theory of deliberate practice* (Ericsson, 2006, 2004, 1996; Ericsson and Lehmann, 1996). According to this theory, the performance level achieved by experts is determined by the amount of time 'spent performing a well-defined task with an appropriate difficulty level for that particular individual, with informative feedback, and opportunities for repetition and corrections of errors' being provided (Ericsson, 1996; p.20).



**Figure 1.4: Influence of experience and deliberate practice on expert performance (Adapted from Ericsson, 2006, 2004)**

Deliberate practice fosters two kinds of learning; it improves the range of skills already possessed by the practitioner and extends the reach and range of those skills (Ericsson, 2006; Ericsson et al., 2007).

#### **D) Expert training and coaching**

Early research into the nature of expertise proposed the '*10-year rule*' which theorised that practitioners will need to commit to high levels of training for a minimum of 10-years to reach expert levels of practice (Simon and Chase, 1973). The 10-year rule which stemmed from pioneering research in the field of chess has been shown to hold true in the fields of music (Ericsson et al., 1993), sports (Ericsson, 1996), meteorology and aviation (Hoffman, 1996) but not in medical expertise (Alderson, 2010).

Ericsson and colleagues argue that it is not so much as the time spent in training that determines expertise; but rather the quality and nature of the training undergone by a practitioner (Ericsson et al., 2007). Furthermore, they argue that the important factor in training is to spend as much time as required in deliberate practice while also citing the

influence of the expertise of the coach as an important training factor (Ericsson, 1996; Ericsson et al., 1993).

### **1.5.5 Theories of expertise development**

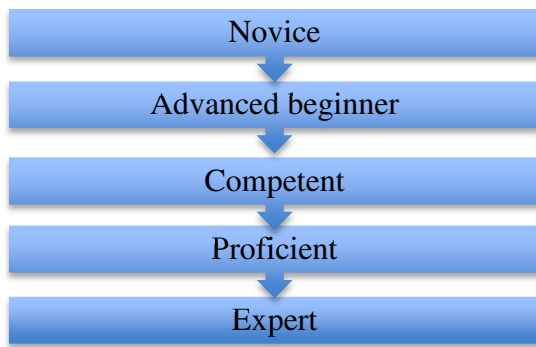
Dreyfus and Dreyfus, (1986), proposed a five-staged model of skill acquisition in a seminal work, *Mind over Machine*. According to this model, an individual develops expertise in a stage-wise fashion from *novice*, *advanced beginner*, *competent*, *proficient* up to an *expert* level (Fig. 1.5).

Dreyfus & Dreyfus model of skill acquisition distinguishes these five stages of proficiency based on:

- A) The depth of knowledge acquired
- B) The level of skill attained
- C) Contextual perception and
- D) The decision-making process of the practitioner

According to this model, (Figure 1.5), skill acquisition arises as a result of experience within the given vocation. As a *novice*, much of one's practice involves a strict adherence to taught rules and guidelines with no perception of contextual or situational peculiarities. The goal of practice at this level is to complete a given job task successfully. Decision-making is non-discretionary and without the benefit of prior experience.

Over time and with practice, a novice is able to improve and advance to the next stage of development to become an *advanced beginner*.



**Figure 1.5: A model of skill acquisition (Adapted from Dreyfus and Dreyfus, 1986)**

An advanced beginner has the benefit of additional knowledge from experience with some form of situational awareness being involved in decision-making. Practice at this level still remains task-oriented and rule-based with complex decision-making delegated to a more experienced co-worker. Progress from novice to this stage of practice can be achieved within a year of practice (Benner, 1984).

Through further training and experience, an advanced beginner is able to progress to become a *competent* practitioner. A competent practitioner is capable of handling complex situations with performance at this level of practice being more coordinated, routine and standardised. Experience and prior exposure to the domain of practice benefits practise and decision-making at this stage is analytical, situational and based on perceived long-term goals. Advancement to this stage of practice can be achieved within two years of practice in a specific domain (Benner et al., 1996). Thereafter, a practitioner is able to progress to being *proficient*.

A proficient practitioner has a holistic approach to practice and takes actions based on the recognition of situational peculiarities. Decision-making at this stage of development is a direct consequence of an understanding of the given situation due to prior experience. Job tasks are carried out without much deliberation with performance being quick and more fluid. Automaticity of performance is attained at this level of practice and this level can be achieved within 3-5years of practice (Benner et al., 1996).



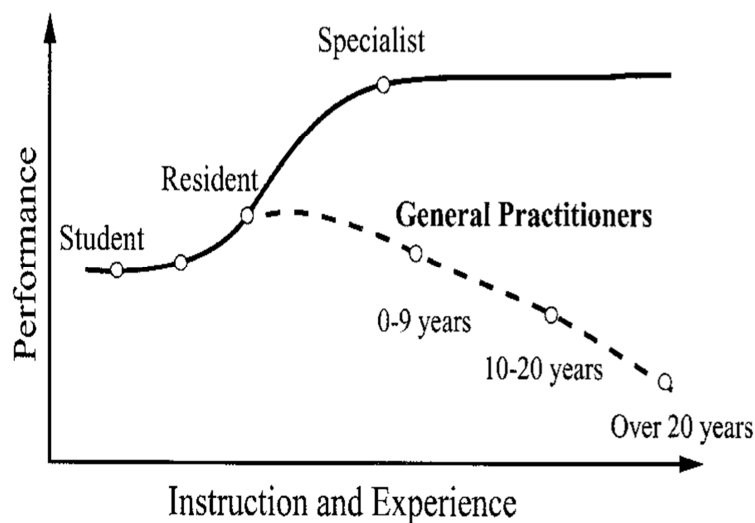
Further progression leads to the attainment of an *expert* level of practice. Experts are able to make decisions intuitively, are more involved in decision-making, are able to see situations holistically and in parallel with the other elements of the situation, and are therefore capable of weighing suitable alternatives. With increasing experience from different situations, patterns become clear, actions become obvious and performance becomes even more seamless. This level of practice is attainable within 10 years of practice in a given domain (Ericsson, 1996; Ericsson et al., 1993; Ericsson and Lehmann, 1996).

Dreyfus & Dreyfus theory of skill acquisition was developed as a critique of artificial intelligence. The theory was mostly anecdotal, phenomenal and not based on empirical data from scientific experiments (Eraut, 2000). It was explained using examples involving chess players and the stepwise process in learning to ride a bike or a car (Dreyfus & Dreyfus 1986).

The theory acknowledges the role of training and resultant experience in the development of expertise and proficiency. It makes a clear distinction between a trained individual and an experienced one and explains how learning is consolidated and enforced through experience. It therefore acknowledges progression towards an ability to undertake complex task in an intuitive manner as being dependent on experience in the required domain. Dreyfus & Dreyfus theory of expertise development has been applied and shown to be true in the field of nursing (Benner, 1984; Benner et al., 1996).

Ericsson (2004 and 2006) proposed a model for expertise development in medicine (Figure 1.6). In this model performance is initially seen to increase with increasing years of training and experience as the medical practitioner progresses from being a student, to medical resident, and up to the point of becoming a specialist. Upon completion of medical and specialist training, no further increases in performance is observable and a stable but pedestrian level of performance is attained (Ericsson, 2006, 2004).

An early study conducted by Butterworth and Reppert (1960) demonstrated this scenario. In this study, recordings of heart sounds and murmurs of sick and healthy patients were presented to groups of medical students, resident doctors, certified cardiologists and general practitioners simultaneously.



**Figure 1.6: Development of medical performance as a function of experience and instruction (Adapted from Ericsson, 2004)**

Medical students showed the lowest level of diagnostic accuracy followed by medical residents with the highest level of accuracy recorded in the group of certified specialists. It was also observed that general practitioners did not show a corresponding increase in diagnostic accuracy with more experience, rather, performance was observed to decrease as a function of ‘*time gone by*’ since the completion of medical training. In this group of practitioners, an increase in number of years gone by after training was associated with a gradual decline in performance (Butterworth and Reppert, 1960).

This study suggests continued and specialised training likely promotes improved performance in specific tasks related to that domain of practice (Ericsson, 2004). Similar findings from other studies have corroborated this feature and show that continued training has a positive influence on performance (Crowley et al., 2003; Hatala et al., 1999; Norman et al., 1989; Wolf et al., 1994). In these studies, practitioners who went through short-term training courses with feedback were observed to show enhanced performance, but this performance declined gradually after training. Practitioners who retained elements of such training for up to a six-month period also showed observable decline in performance thereafter (Hatala et al., 1999; Horiszny, 2001; McGuire et al., 1964).

Taken together, these studies demonstrate a relationship between training activities and increased and sustained improvement in performance (Ericsson, 2004). This implies that clearly defined, continuous and guided practice with feedback from other experts promotes learning and development of expertise in novice practitioners (Ericsson, 2004).

## **1.6 Expertise Development in Pharmacy**

An initial period of undergraduate pharmacy education and training is required prior to being registered to practice as a pharmacist. This period is traditionally thought to equip an individual with the requisite knowledge needed to perform up to the minimum standards of acceptable practice at initial registration (Eraut, 2000). Thereafter, it is expected that a 'day 1' pharmacist develops his/her practice and advance in knowledge and skills through experience and life-long learning (Hill et al., 2006). This progression in knowledge and skill acquisition attained through experience is termed professional development and describes the continuous improvement in practice that occurs as a result of continuing learning.

Professional development deals with the on-going learning of skills and knowledge by a practitioner to enable both personal development and career advancement (Daugherty, 2009; Institute of Medicine, 2010; Speck and Knipe, 2005). It covers all the aspects of formal and informal learning activities that are situated in practice (Daugherty, 2009).

Professional development encompasses two closely related concepts: continuing education (CE) and continuing professional development (CPD). Continuing education (CE) is a form of didactic learning undertaken by professionals in order to update knowledge and maintain and translate knowledge into practice (Institute of Medicine, 2010). It is defined by the Accreditation Council of Pharmacy Education as 'a structured educational activity designed or intended to support the continuing development of pharmacists and/or pharmacy technicians to maintain and enhance their competence' (Accreditation Council of Pharmacy Education, 2014).

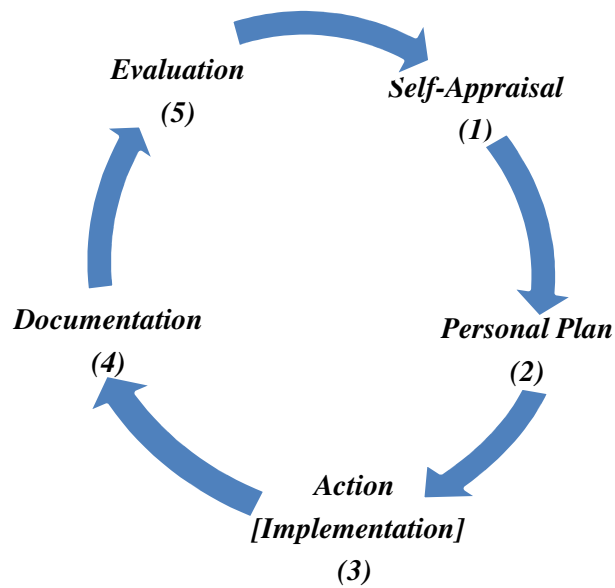
CPD on the other hand, incorporates continuing education as a subset and includes all the other types of learning activities undertaken by a practitioner either formally or informally, and on the job (Institute of Medicine, 2010). CPD is defined as the 'system of maintaining, improving, and broadening knowledge and skill throughout one's professional practice' (Institute of Medicine, 2010; p.18). In pharmacy, it is defined as 'the responsibility of individual pharmacists for systematic maintenance, development and broadening of

knowledge, skills and attitudes, to ensure continued competence as a professional throughout their careers' (International Pharmaceutical Federation, 2002, p. 2).

Compared to CPD, continuing education has a narrow focus, is teacher-driven and often serves the primary purpose of providing an avenue for obtaining credits for re-licensure and recertification (Institute of Medicine, 2010). CPD on the other hand is learner-driven, self-directed and outcome-based. It affords the learner the opportunity to identify learning gaps and undertake activities tailored to individual learning needs (Institute of Medicine, 2010; Rouse, 2004).

CPD involves a five-staged cyclical process of self-appraisal, planning, action, documentation and evaluation (Figure 1.7) (International Pharmaceutical Federation, 2002). The first stage of the CPD cycle involves self-appraisal through reflection. This phase aims to identify learning gaps and areas that require improvement at an individual level. Such appraisal can be carried out personally by the learner or by the learner's peers, colleagues, supervisor or employer or as a requirement by a professional or health authority. The second stage of the CPD cycle is the identification of the resources and actions required to meet CPD needs.

The third phase of the CPD cycle involves active participation in relevant CPD activities and may include formal activities like short courses, workshops, seminars and self-study. It may also include informal activities such as meetings and discussions with colleagues or mentor as well as informal on-the-job learning that occurs during practice. The fourth phase of the CPD cycle involves documentation and recording of all the CPD activities undertaken with documented evidence provided where necessary. The final phase of the CPD cycle is the evaluation of the outcome of all the CPD activities undertaken in order to determine the effectiveness of those learning activities. It also involves the evaluation of the challenges encountered by the learner in the CPD cycle.



**Figure 1.7: Continuous professional development cycle (Adapted from International Pharmaceutical Federation, 2002)**

The CPD cycle is repeated periodically to ensure that continuing professional development occurs throughout one's professional career (Institute of Medicine, 2010; International Pharmaceutical Federation, 2002). In recent years, participation in CE and CPD activities has become a mandatory requirement to maintain license to practice pharmacy in a number of countries (International Pharmaceutical Federation, 2009). Mandatory CPD is now a regulatory prerequisite for retaining the annual practicing certificate (APC) for pharmacists in New Zealand (Harrison et al., 2012; Pharmacy Council of New Zealand (PCNZ), 2004). In 2004, the Royal Pharmaceutical Society of Great Britain introduced CPD for pharmacists in UK. In 2007 maintaining evidence of CPD activities relating to an individual's area of practice became a mandatory professional requirement for retaining license to practice pharmacy (Department of Health, 2008; Royal Pharmaceutical Society of Great Britain, 2007, 2003a).

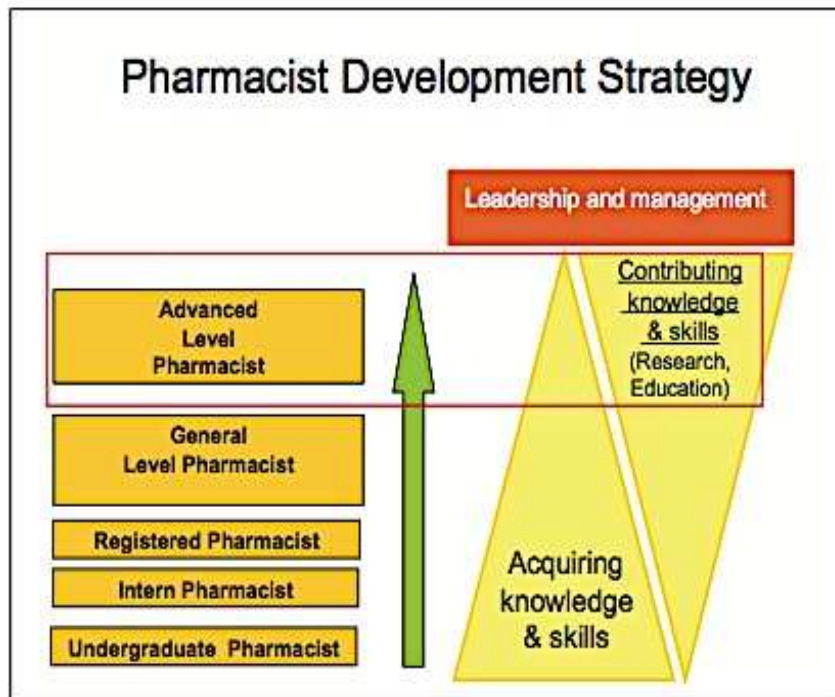
In 2010, CPD became mandatory for registered pharmacists in Australia (Coombes et al., 2012). Many other countries around the world including Portugal, France, Ireland, Nigeria, Kenya and others have implemented mandatory CPD activities for pharmacy practitioners (International Pharmaceutical Federation, 2009).

### **1.6.1 Models of expertise development in pharmacy**

Pharmacy practice has both a horizontal and vertical dimension (Modernising Pharmacy Career Programme, 2012; Pharmaceutical Society of Australia, 2010). The horizontal dimension defines the *breath or scope of practice* while the vertical dimension describes the depth of practice; also referred to as *performance level*.

Scope of practice describes those actions, processes and activities which a practitioner is educated, licensed and competent to carry out (Anderson, 2012). Depth of knowledge, skills and experience defines the scope of practice of a health practitioner (Council on Credentialing in Pharmacy, 2010a). It sets the boundaries of practice for an individual practitioner as authorised by the relevant professional regulator (The Federation of State Medical Boards of the United States, 2005).

Performance level on the other hand, is concerned with capability and reflects the expertise and professional advancement of a pharmacy practitioner (Coombes et al., 2011; Modernising Pharmacy Career Programme, 2012). A practitioner development model for pharmacy has been suggested by Coombes et al., (2011). This model, as shown in Figure 1.8, describes the pathway of development for a pharmacist. It depicts the expansion in roles and responsibilities that arises as a result of an increase in proficiency.



**Figure 1.8: Pharmacists development strategy, roles and responsibilities (Adapted from Coombes et al., 2011)**

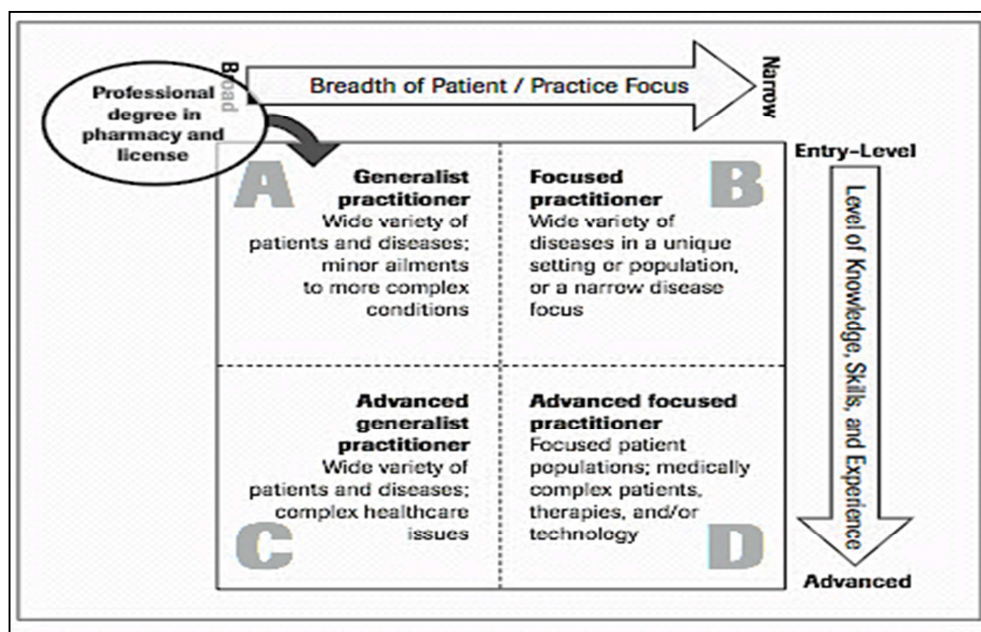
In this model, the acquisition and consolidation of knowledge and skill is the focal point of practice in the early years; that is, from the undergraduate level to a general level of practice. As performance increases due to experience, further training and/or formal education, a threshold performance level is attained above which practice is termed advanced. Advanced pharmacy practice is defined as practice ‘that is so significantly different from that achieved at initial registration that it warrants recognition by professional peers and the public of the expertise of the practitioner and the education, training and experience from which that capability was derived’ (Pharmaceutical Society of Australia, 2010; p.5).

Pharmacists who practice at an advanced level are more involved in contributing knowledge and skills for the development of colleagues and other professionals in contrast to early career pharmacists. These advanced practitioners have a greater contribution to leadership and management and are involved in the training of other pharmacists, research and in the development of inter- and intra-professional working relationships (Coombes et al., 2011).



Figure 1.9 is an example of how scope of practice and performance level may be used to describe the professional practice profile of a pharmacist involved in a ‘patient-facing’ role. It is a model of practice progression and describes how scope of practice may change as result of changes in depth of knowledge, skills and experience (performance level) (Council on Credentialing in Pharmacy, 2010a).

According to this model, the scope of practice of a pharmacy practitioner can be broad or narrow. An entry-level pharmacist will have a broad scope of practice but possess only a limited amount of knowledge and skill, reflecting the level of professional practice expected of a novice pharmacist. This pharmacist will practice only at a general level.



**Figure 1.9: Defining professional pharmacy practice using scope of practice and performance level (Adapted from Council on Credentialing in Pharmacy, 2010)**

Over time and with progress in skill and knowledge acquisition, such a pharmacist may choose to limit his/her scope of practice, in which case they will be involved in managing either specific disease states or a specific patient population (for example, a specialist-in-training pharmacist). As depth of knowledge and skills increases significantly through

experience in a specific domain, the pharmacist progresses and attains advanced level skills, knowledge and professional capability and is able to deal with complex health issues in a specific patient population or specific disease states (for example, certified oncology or renal pharmacist). Such a pharmacist is described as a ‘focused advanced pharmacist’.

Conversely, a pharmacist though advanced in knowledge and skills may choose to remain within a broad scope of practice. In this latter case, even though the capability/performance level of such a practitioner is high, their scope of practice will remain broad and will involve dealing with complex health issues from a wide variety of patients or disease states. Such a pharmacist will be recognised as ‘an advanced generalist’ pharmacist. Therefore in the pharmacy profession, a narrow scope of practice does not always signify advancement or development of high level expertise in contrast to the medical profession where a narrowing in the scope of practice of a practitioner (that is, specialisation) signifies an enhanced level of expertise obtained through advanced training (Pharmaceutical Society of Australia, 2010).

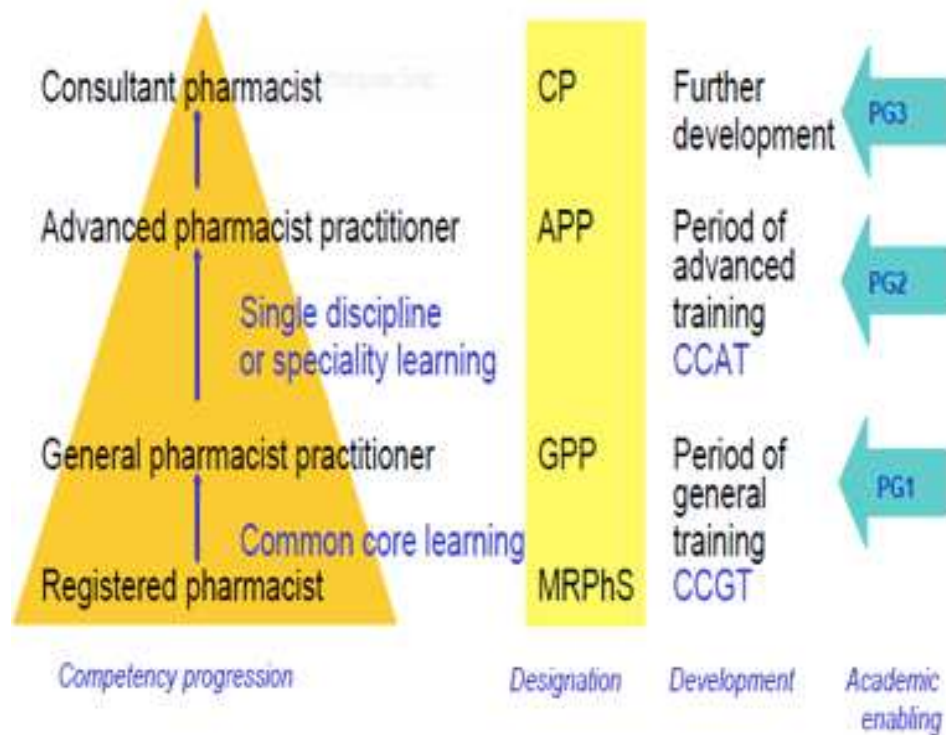
Davies (2002) (cited in Obiols, 2008; p. 26) proposed another model that describes the pathway for progression from a registered pharmacist up to the attainment of advanced/expert level practice (Figure 1.10). This model describes a stepwise increase in proficiency that occurs through experience and increase in knowledge and skills.

The model depicts four levels of competence:

- Registered pharmacist
- General pharmacist practitioner
- Advanced pharmacist practitioner and
- Consultant pharmacist

The model also defines two distinct training phases culminating in the award of a ‘certificate of completion of training’. In this model, the novice ‘registered pharmacist’ is able to increase in knowledge and skills through experience and progresses to being a ‘general pharmacist practitioner’. In order to progress from a ‘general pharmacist practitioner’ to an ‘advanced pharmacist practitioner’, a general pharmacist practitioner must undertake general

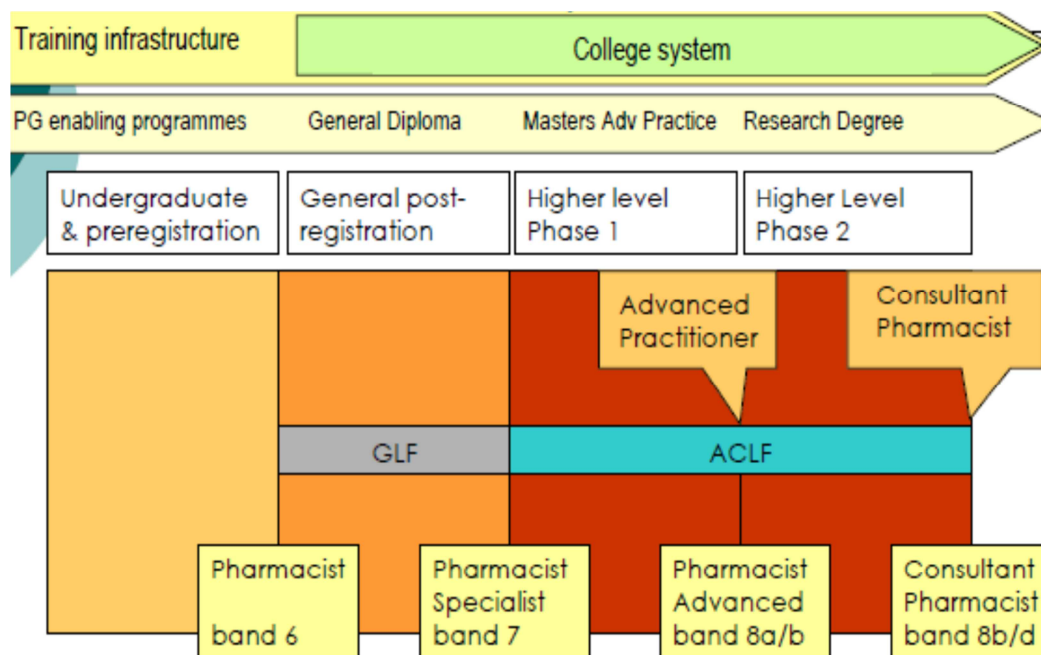
level training over a period of two to three years with the award of a certificate of completion of general training (CCGT) at the end of training. Thereafter, further progression is attained via advanced training in a single discipline or specialty with the award of a certificate of completion of advanced training (CCAT).



**Key:** *MRPhs* – Member Royal Pharmaceutical Society, *GPP* – General pharmacy practitioner, *APP* – Advanced pharmacy practitioner, *CP* – Consultant pharmacist, *CCGT* – Certificate of completion of general training, *CCAT* – Certificate of advanced training, *PG1* – Postgraduate degree certificate, *PG2* – Postgraduate diploma, *PG3* – Postgraduate masters.

**Figure 1.10: A Strategy for practitioner development (Adapted from Davies, 2002)**

Figure 1.11 describes a development model for pharmacists practising within the National Health System (NHS) of the United Kingdom. This model depicts the horizontal dimension of competence progression and maps the pathway of career advancement for pharmacists within the NHS.



**Figure 1.11: A pharmacist development model - NHS (Adapted from Davies, 2007)**

The model combines both formal educational programmes and training activities to enable practitioner progression. These enabling programmes are undertaken at two broad levels of practice: the general and the advanced level. Each level of training is undertaken using competency frameworks, that is, the RPS Foundation Level Framework (RPS-GLF) and the RPS Advanced Pharmacy Framework (APF-RPS) respectively.

In this model, individual practitioners are required to evaluate themselves against the competencies contained in the framework relevant to their specific level of practice. Documented evidence of progression is then collated and presented in form of a portfolio for peer review and evaluation (Davies et al., 2004; Duggan, 2013).

### **1.6.2 Professional recognition, credentialing and recertification in pharmacy**

The need to promote continuing development and demonstrate evidence of practitioner progression and capability has driven the introduction of defined professional recognition and credentialing processes by many health professions around the world (Department of Health, 2012).

Credentialing is defined by the Council on Credentialing in Pharmacy, as the ‘process of granting a credential (a designation that indicates qualifications in a subject or an area of practice)’. It is also defined as the ‘process by which an organization or institution obtains, verifies, and assesses qualifications to provide patient-care services’ (Council on Credentialing in Pharmacy, 2010; p.e65) and the ‘process used by health care organisations to validate professional licensure, clinical experience, and preparation for specialty practice’ Galt (2004; p.661). Credentials generally refer to documented evidence of professional qualifications that an individual possesses. In pharmacy, examples of credentials include academic qualifications, license to practice, residency training certificates, and other post-registration certifications (Council on Credentialing in Pharmacy, 2010b).

Professional recognition, which may also be referred to as credentialing, is defined as a ‘quality assured process which recognises a practitioner’s attainment of the required knowledge and skills at a particular level of practice’ (Joint Partners Credentialing Task Group (JPCT), 2013; p.35). Professional recognition serves as a guarantee of an individual’s capability and competence to deliver specific services and procedures (Joint Partners Credentialing Task Group (JPCT), 2013). It is useful for supporting progression and advancement for practitioners who aspire to attain higher-level practice, is a quality assured means for demonstrating the competence and capability of a practitioner to peers, patients, employers, general public and other stakeholders, and provides access to professional development programmes relevant for practice progression beyond initial registration (Duggan, 2010). Although professional recognition is not linked to a regulatory function, it however provides a useful means for revalidation (Joint Partners Credentialing Task Group (JPCT), 2013).

Some countries have a defined professional recognition process in pharmacy. For example, the Board of Pharmacy specialties (BPS) of the USA has a defined certification process for six specialty programs: ambulatory care pharmacy; nuclear pharmacy; nutritional support pharmacy; oncology pharmacy; pharmacotherapy pharmacy and psychiatric pharmacy (Board of Pharmacy Specialties, 2016, 2013a). The National Association of Pharmacy Regulatory Authorities in Canada (NAPRA) certifies pharmacists with advanced skills and training in four specialty areas: anticoagulation management, asthma management, diabetes management and advanced pharmacotherapy management (National Association of Pharmacy Regulatory Authorities, 2014b) while in the United Kingdom, the Royal Pharmaceutical Society recognises advanced pharmacy practitioners in three stages: advanced stage I, advanced stage II and mastery stage. This recognition culminates in the award of specific post-nominal to the practitioner for having attained a specific stage of advanced pharmacy practice (Duggan, 2013).

Initial certification by the BPS is based on a combination of post-registration training, experience in a defined specialty and achieving a pass grade in a formal specialty examination (Board of Pharmacy Specialties, 2013c; p.13). This is in contrast to Canada where initial certification is achieved via a combination of knowledge, knowledge application and performance-based assessments. Knowledge and knowledge application assessment involves taking a formal examination in the specialty area while performance based assessment includes a portfolio and an on-site practice review and audit (National Association of Pharmacy Regulatory Authorities, 2014b). The professional recognition process of the RPS in United Kingdom involves formal assessment via self-assessment of competence using the RPS Advanced Pharmacy Framework and/or an interview. The assessment methods include structured portfolio review, multi-source feedback (MSF), on-site practice reviews via direct observed practice (DOP) or structured case-based evaluation methods (Joint Partners Credentialing Task Group (JPCT), 2013).

Practitioners certified by the BPS of USA are awarded 'post-nominals' specific to their practice areas and are also required to undertake periodic recertification every seven (7) years. This recertification process is a three-step process and includes self-evaluation, peer review of a portfolio of evidence and a formal assessment process. The formal assessment

may include either undertaking an examination or accumulating a defined number of continuing education credits in an accredited and BPS-approved education programme in the required specialty (Board of Pharmacy Specialties, 2016).

## 1.7 Learning Theories

Learning can be defined as a ‘process in which a learner attends to surrounding circumstances and is changed by the exposure to them’ (Dressel and Marcus, 1982; p.21). Burner described learning as an active process through which a learner develops new ideas and concepts based on their past or present knowledge (Bruner, 1977). An understanding of how adults learn can provide a theoretical framework for the design of training and development activities that promote learning (Norman, 1999). A number of theories that explain how adults learn exist. This section will give a brief overview of a few of the adult learning theories that may be useful for pharmacy practice.

### 1.7.1 Andragogy

Malcolm Knowles defined *andragogy* as the ‘art and science of helping adults learn’ (Knowles, 1980; p.43). The term andragogy stems from two root words: *andr-* meaning ‘man’ and *agogos-* meaning ‘leading’ (Smith, 1996). Andragogy as proposed by Knowles provides a theoretical framework on adult learning based on five key assumptions:

- *Self-concept*: Knowles recognises adult learners as independent and self-directed learners capable of being responsible for their own learning. Andragogy therefore proposes that educational activities intended for adult learners should be undertaken with the active participation of the individual learner in the design and implementation of such activities.
- *Experience*: Andragogy places an emphasis on the role of an adult’s past experience. According to this theory, the volume and quality of an adult’s past experience serves as an on-going resource for learning and will therefore have a bearing on any current learning situation. Therefore, adult learning activities need to be designed in a way that takes cognisance of the influence of their past experiences.
- *Readiness to learn*: According to this theory, self-recognition of knowledge gaps in the adult learner triggers a readiness to learn. As a result of this self-recognition, an adult learner undertakes specific learning activities in order to improve his/her own effectiveness or performance. This readiness to learn can be



triggered by a number of stimuli. According to Knowles, involving the adult learner in career planning and exposing the adult learner to more effective role models whom he/she can aspire to emulate are some of the possible avenues through which a readiness to learn can be triggered (Knowles, 1980).

- *Orientation to learning:* Adults have a problem-centred orientation towards learning and will be more willing to learn if what is to be learnt will prove relevant in coping with real life situations. Therefore in designing learning experiences for adult learners, emphasis should be placed on organising such activities around areas that are immediately relevant to solving real-life problems. Such activities should not be designed around subject matters that have no direct bearing on the life situation of the learner.

- *Motivation:* In adults, the motivators for learning are largely internal and not external. Internal drivers like the need for self-recognition, self-actualisation and greater self-confidence provide potent motivation for learning. Learning programs should therefore be designed in a way that incorporates such motivating factors.

The assumptions of andragogy as described by Knowles were mostly philosophical and stemmed from years of observations and practice in adult education (Knowles, 1980, 1968). It was not based on initial empirical data. The model has however been applied in a variety of adult learning settings that have produced evidence that support the veracity of the theory (Malcom Knowles & Associates, 1985).

### **1.7.2 Social learning theory**

Bandura (1971) proposed a theory of social learning which emphasises the influence of environmental and cognitive factors on learning and human behaviour. According to this theory, human behaviour is shaped through experience, imitation and observation of role models within a social environment. Consequently, the role models that a learner is consistently exposed to in a social group will determine the type of behaviour that the learner repeatedly observes and subsequently models. This kind of learning occurs in a social context through observation, imitation and modelling of observed behaviour.

Four sub-processes govern this modelling process:

- i. Attention
- ii. Retention
- iii. Motoristic reproduction of behaviour
- iv. Reinforcement and motivation

This theory posits that simply exposing the learner to the behaviour to be learnt does not guarantee learning. For learning to occur, the learner needs to consciously attend to and recognise the key features of the behaviour to be imitated. The learner also needs to be able to retain and store information about the observed behaviour over a long period of time for future retrieval. Performance and imitation of observed behaviour alongside further practice promotes improvement and skill advancement. The observed behaviour can be reinforced either positively through incentives or negatively through punishment and this reinforcement leads to a change in behaviour (Bandura, 1971). It is at this stage of an observed change in behaviour that learning is said to have occurred (Mcleod, 2011).

### **1.7.3 Social development theory**

Lev Vygotsky proposed a theory that emphasised the central role of social interaction and culture on cognitive development (Vygotsky, 1978). According to Vygotsky, cognitive development occurs through the social interaction of an individual (particularly a child) with a skillful tutor. Vygotsky proposed that learning occurs as the learner models behaviour and verbal cues provided by an expert or skillful tutor. Vygotsky described this type of social interaction as *collaborative dialogue* in learning (Vygotsky, 1978).

Vygotsky theory of cognitive development hinged on two principles:

- i. More knowledgeable other (MKO) and
- ii. Zone of proximal development (ZPD)

MKO refers to persons of higher understanding or ability in the specific task, concept or process that the learner needs to learn. An MKO may be a trained tutor or coach, a parent, a mentor, or the learner's colleagues (Vygotsky, 1978). ZPD on the other hand refers to the

difference between what an individual can achieve on his/her own and what is achievable with guidance from a partner who is more skilled or experienced (Vygotsky, 1978). Vygotsky sees the ZPD as the point where learning can be maximised through the provision of guided feedback and instructions by the MKO, thereby enabling the learner develop higher mental capacities and capabilities. This kind of learning is active and involving and is seen by Vygotsky to be an effective way of developing skills and knowledge.

The learning concept described by Vygotsky is observed in apprenticeships, internships, scaffolding and other instructional techniques where more advanced peers are involved in task structuring in way that ensures novice practitioners successfully complete such tasks (McLeod, 2012). The principle of MKO and ZPD ensure that learning is facilitated and integrated in practice. Therefore, using this theory, novices are capable of developing competence through engagement and social interactions with fellow practitioners or expert colleagues (McLeod, 2012).

#### **1.7.4 Lifelong learning**

Age theory is one of the broad branches of adult learning theories initially proposed to explain and understand how adults learn (Levinson et al., 1979; Sheehy, 1976). Age theory sought to determine the concerns, challenges or problems that hinder learning as people age. Theorist under this branch of inquiry focused on reporting age-related issues that affected learning. This branch of inquiry provided initial evidence that confirmed that learning was an activity that continued throughout a person's life cycle. It also provided initial insight into lifelong learning (Trotter, 2006).

Lifelong learning encompasses all the learning activities that an individual undertakes formally and informally throughout their professional career (Institute of Medicine, 2010). Health professionals involved in care delivery are required to continually engage in learning so as to achieve both personal and professional growth (Institute of Medicine, 2010). The importance of lifelong learning in the health professions is underscored by rapid advancement in technology, use of sophisticated therapies and the changing healthcare environment, which requires practitioners to continually improve their skills and increase in knowledge. Lifelong learning ensures that health professional involved in care delivery

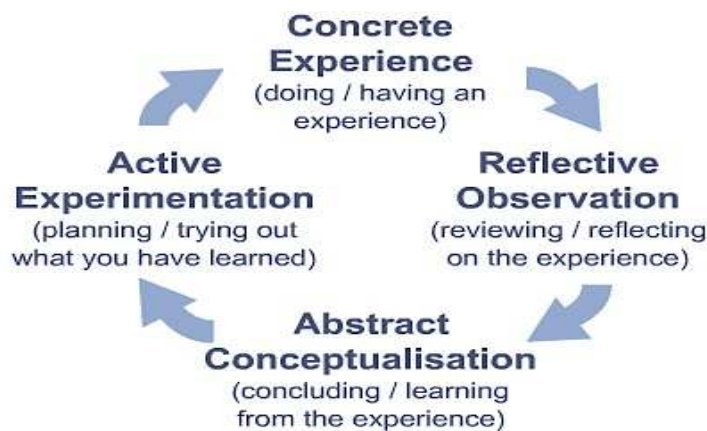
continually take responsibility for their development so as to keep up to date, attain and maintain competence as well as fitness to practise (Institute of Medicine, 2010).

### 1.7.5 Experiential learning

Kolb (1984; p.38) defines learning as a 'process whereby knowledge is created through transformation of experience'. Kolb used a four-staged cyclical process to propose the theory of experiential learning (Figure 1.12).

The four stages include:

- A. Concrete experience
- B. Observation and reflection
- C. Abstract conceptualisation and
- D. Active experimentation



**Figure 1.12: Kolb's learning cycle**

According to this theory, the cycle of learning begins with the learner experiencing an activity in the learning environment. Thereafter, the learner consciously reviews, analyses and reflects on this experience. It is from this reflection that the learner is able to translate experience into concepts or models. This ensuing conceptualisation serves as a guide for the

learner to plan and actively test concepts in new situations. The learning cycle can commence at any stage but upon commencement, the learner has to continue the cycle sequentially.

Kolb identified four basic learning styles that correspond to each stage in the learning cycle. These include:

- **Assimilators** who learn better by reflection and abstract conceptualisation. They are able to create theoretical models from abstract concept and are capable of applying these models to new experiences.
- **Accommodators** who learn primarily through concrete experiences and experimentation and will therefore learn better when they participate and are involved in practical 'hands-on' experiences.
- **Convergers** who learn primarily through abstract conceptualisation and active experimentation. They learn better when abstract concepts and ideas are applied to practice.
- **Divergers** who learn primarily through concrete experiences and reflective observation. They learn better through reflection and generating ideas and concepts from their experiences.

Although research on pharmacists' preferred learning style and learning approach is currently limited, evidence from two studies by Austin (2004) and Loewen et al., (2014) suggest pharmacists are predominantly assimilators and convergers. Research in the field of medicine show that general practitioners are predominantly assimilators (Robinson, 2002) and accommodators (Christensen et al., 1985) while neurosurgeons and residents favour the assimilating and diverging learning styles (Lai et al., 2014).

Other studies show that post-graduate medical (Gurpinar et al., 2011), pharmacy (Williams et al., 2013) and undergraduate nursing (D'Amore et al., 2012) students have a preference for converging and assimilating learning styles. Conversely, a study by Pungente et al., (2003) showed an even distribution of learning styles among a group of first year pharmacy students although more of the students (36%) preferred the accommodator style of learning. A study by Smits et al (2004) indicates the accommodator learning style is associated with an increase in knowledge but not with change in performance.

Evidence from published studies by Gurpinar et al., (2011), Novak et al., (2006), van den Berg, (2015), Bitran et al., (2012), Loewen et al., (2014) and Gonyeau et al., (2006) indicate that preferred learning styles may change over time with respect to a change in the learning environment. For instance, the preferred learning style of medical students may change from divergers to convergers and assimilators as they progress from undergraduate education to the more 'hands-on' clinical practice environment (Gurpinar et al., 2011). Other studies involving a group of first year undergraduate pharmacy students also suggest that preferred learning approach may change from an initial surface learning strategy (involving memorising and reproducing information from lectures) to a deep and reflective learning approach (where the students derive meaning from theoretical knowledge and actively seek to apply this in solving problems) as they progress to their final year and up until post-graduate training and practice (Smith et al., 2010, 2007).

Published research suggests learning styles may be predictive of a successful educational outcome (Smits et al., 2004) and likely influences knowledge and skill acquisition as it relates to preferred instructional method (Austin, 2004; Christensen et al., 1985; Tsingos et al., 2014). Therefore, health professionals may be more inclined to partake in lifelong learning and continuing education activities when instructional methods are matched to their learning styles (Robinson, 2002; Tsingos et al., 2014). For example, evidence from the study by Smits et al (2004) suggest problem-based learning format may be associated with better performance outcomes than formal lectures for physicians ( $P=0.05$ ). On the other hand, studies involving paediatricians (Al Shaikh, 2015) showed no correlation between learning styles and satisfaction with instructional methods.

Overall, the available evidence suggests that a combination of instructional methods that take into consideration the diversity in preferred learning styles among health professionals is necessary for the design of a learning curriculum that would provide a successful educational outcome and promote lifelong learning (Al Shaikh, 2015; Robinson, 2002; Tsingos et al., 2014).

## **1.8 Chapter Conclusion**

This chapter provided an overview of the pharmacy profession and its role in the quality of care delivered in the health sector. It also gave an overview of the education, training and development strategies in pharmacy. An outline of the concept of competence, competency-based education and training, the use of competency frameworks in the education of health professionals, some adult learning theories alongside a narrative literature review of the development of expertise and its theories, were also provided.

## **Chapter 2 RESEARCH QUESTIONS, AIMS AND OBJECTIVES**

### **2.1 Developing the Research Questions**

Competent pharmacists improve therapeutic outcomes, minimise the risk associated with medicines use, and positively influence the overall quality of care delivered in the health sector (Department of Health, 2008; Giberson et al., 2011). It is therefore important to define and articulate the exact competencies pharmacists need to consistently perform safely, effectively and efficiently in their roles. These competencies once identified are often compiled to form a framework that provides a blueprint of the knowledge, skills, and attributes that are valuable for effective professional performance (Brownie et al., 2011a).

Competency frameworks are extensively used in the healthcare professions. Many countries have established competency frameworks and practice standards at both national and organisational levels (Kak et al., 2001). A preliminary scoping internet search for competency literature using the key words ‘competency frameworks’ and ‘practice standards’ and limited to the healthcare professions returned an extensive array of published literature. This included frameworks developed for medicine, nursing, pharmacy, public health, physiotherapy, health promotion and other allied health professions.

#### **2.1.1 Competency frameworks in pharmacy: A systematic review of the literature**

A systematic literature review was conducted to:

- Identify global, regional and national competency frameworks for pharmacy practice
- Determine the methodological processes used to identify the competencies contained in such frameworks
- Identify evidence of the applicability of these frameworks, and
- Identify evidence of the effectiveness of competency frameworks in pharmacy.

SCOPUS, Web of Science, OvidSP and CINAHL electronic databases were searched to retrieve published literature. The OvidSP platform provided access to literature from the following electronic databases: EMBASE, PsycINFO, PsycTESTS, Allied & Complementary Medicine (AMED), Health & Psychological Instruments, Health Management Information Consortium (HMIC), Ovid Medline Research In-Process & Other Non-indexed Citation (to search for grey literature), Social Policy and Practice, and International Research Abstracts.



The websites of specific pharmacy journals were also searched. These included the American Journal of Pharmaceutical Education, American Journal of Pharmacy and Health Research, Academic Journal of Pharmacy, International Journal of Pharmacy Practice, Pharmacy Education Journal, and the Pharmaceutical Journal.

The key words used were 'competency', 'competence', 'credentialing', 'competency framework', 'competency-based education', 'professional development', 'practice', 'standard', and 'pharmacy'. Free text search using Boolean operators [OR & AND] to combine words was conducted for the databases. Key word truncation {for example, competenc\*, pharmac\* and credential\*} was used in the PubMed database to ensure all relevant Medical Subject Headings (MeSH) terms were included in the search. The FIP membership list was also consulted with the organisation websites manually searched to retrieve published frameworks.

Since the systematic search was also directed by the findings of a 2012 (International Pharmaceutical Federation, 2012) and 2014 (International Pharmaceutical Federation, 2014) FIP global survey of pharmacy organisations that showed no published frameworks in other languages; the search result was limited to articles related to pharmacy and published in English from year 2000.

In total, 785 articles were retrieved from the electronic database search queries. The articles provided by the search were examined and screened against the following inclusion criteria:

- Global, regional and national competency frameworks for pharmacy practice
- White papers, supplementary and follow up articles that reported specific methodological processes used in the identification of competencies and the development of frameworks in pharmacy
- Evaluative studies that assessed the usefulness or effectiveness of such frameworks.

Articles excluded were commentaries and editorials on competency-based education or competency-based curriculum development for undergraduate education. Other publications that did not meet the pre-defined inclusion criteria were also excluded. Table 2.1 gives a summary of the search output.

The systematic literature search was conducted in May 2013. Relevant articles were thereafter gathered on a rolling basis with a subsequent search conducted in April 2014 and June 2015 to update literature, although no new frameworks were obtained in these later searches.

**Table 2.1: Summary of electronic database search output**

Database	No. of hits (n)	Articles reviewed (n)
Web of Science	114	6
SCOPUS	159	13 (5 duplicate)
PubMed	364	4 (4 duplicate)
CINAHL	41	7 (5 duplicate)
OvidSP	107	13 (7 duplicate)

Twenty-two relevant articles were identified from the electronic databases search. Six more articles were identified from the manual search of the reference lists of the retrieved studies. Seven national competency frameworks were also retrieved by manual search of FIP member organisation websites.

### **2.1.2 Articles included in the literature review**

In total, 35 articles were included in the literature review:

- Thirteen published frameworks for pharmacy practice including: the FIP global competency framework for foundation level pharmacy practice (International Pharmaceutical Federation, 2010); and 12 national frameworks that contained generic competencies for pharmacy practice. The national frameworks were from New Zealand (Pharmacy Council of New Zealand, 2011), Australia (Pharmaceutical Society of Australia, 2010; the Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012), Canada (National Association of Pharmacy Regulatory Authorities, 2014a), USA (American College of Clinical Pharmacy, 2008b; National Community Pharmacists Association et al., 2012), United Kingdom (Royal Pharmaceutical Society of Great Britain, 2013b; The Royal Pharmaceutical Society of Great Britain, 2014), Singapore (Singapore Pharmacy Council, 2011), Ireland (The

Pharmaceutical Society of Ireland, 2013), Thailand (Thai Pharmacy Council, 2002), and the Pacific Island countries (Brown et al., 2012a).

- Ten studies evaluated applicability or usability of a competency framework in pharmacy practice (Atkinson et al., 2015; Bruno, 2011; Carrington et al., 2011; Costello et al., 2013; Jones et al., 2012; Kennie-Kaulbach et al., 2012; Maitreemit et al., 2008; Meadows et al., 2004; Wright and Morgan, 2012; Obiols, 2008).

- Eight studies evaluated pharmacist performance and identified learning needs using a competency framework. These included 7 longitudinal intervention studies (Antoniou et al., 2005; Coombes et al., 2010; Goldsmith et al., 2003; Meštrović et al., 2012; Mills et al., 2008; Rutter et al., 2012; Stojkov Svetlana et al., 2014), and one study that evaluated change in performance and self-assessed level of understanding after a competency-based training programme (Brown et al., 2015) [Table 2.3].

- Two articles provided further details on the methodological processes used in developing the Advanced Pharmacy Practice Framework [APPF] (Jackson et al., 2015b), and the Royal Pharmacy Society Advanced Pharmacy Framework [RPS-APF] (Royal Pharmaceutical Society of Great Britain, 2013b).

- Two studies evaluated pharmacists' perceptions and preferred method of competence assessment (Jackson et al., 2015a; Joint Partners Credentialing Task Group (JPCT), 2013).

### **2.1.3 Key findings from the literature**

#### ***2.1.3.1 Development of competency frameworks in pharmacy***

Pharmacy practice competencies were mainly identified via initial evaluation of job roles [The Royal Pharmaceutical Society of Great Britain, 2014; National Association of Pharmacy Regulatory Authorities, 2014a], country-specific needs assessment [The Pharmaceutical Society of Ireland, 2013; Brown et al., 2012a], literature review [Thai Pharmacy Council, 2002; International Pharmaceutical Federation 2010; Pharmaceutical Society of Australia, 2010; Pharmacy Council of New Zealand, 2011; Singapore Pharmacy Council, 2011; National Community Pharmacists Association et al., 2012] and framework mapping via content analysis [Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012].

The identified competencies were further evaluated via expert review with consensus obtained either through a nominal group technique [American College of Clinical Pharmacy, 2008b; National Community Pharmacists Association et al., 2012; The Royal Pharmaceutical Society of Great Britain, 2014] or consensus development panel [International Pharmaceutical Federation, 2010]. The frameworks were further validated either via stakeholders' consultation [The Royal Pharmaceutical Society of Great Britain, 2014; National Association of Pharmacy Regulatory Authorities, 2014a; Singapore Pharmacy Council, 2011] or profession wide consultation [Thai Pharmacy Council, 2002; Pharmaceutical Society of Australia, 2010; International Pharmaceutical Federation, 2010; Pharmacy Council of New Zealand, 2011; Singapore Pharmacy Council, 2011; Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012; Brown et al., 2012a; National Community Pharmacists Association et al., 2012]. Profession-wide consultation was primarily carried out via online surveys.

Table 2.2 provides a summary of the global and national pharmacy-related frameworks identified in this review including details of their methodological development processes.

**Table 2.2: Summary of identified competency frameworks in pharmacy and their method of development**

Framework (Country)	Organisation/ Author (Year)	Description	Development Process	Summary
The Core Competency Framework for Pharmacists (Ireland)	The Pharmaceutical Society of Ireland (2013)	6 domains {professional practice, personal skills, supply of medicines, safe & rational use of medicines, public health, and organisation & management skills domain}, 25 competencies and 160 behaviours.	Literature review, country-specific needs mapped against the FIP Global Competency Framework (GbCF v1), expert panel review, profession-wide consultation via online survey.	Defines competencies essential for early career pharmacy practice in Ireland. Used to identify knowledge gaps & learning need. Used to plan & facilitate CPD. Used to develop assessment programmes for evaluation of pre-registration pharmacy graduates seeking entry into the pharmacy register.
Professional competencies for Canadian Pharmacists at Entry to Practice (Canada)	The National Association of Pharmacy Regulatory Authorities (2014a)	9 domains {ethical, legal & professional responsibilities, patient care, product distribution, practice setting, health promotion, knowledge & research application, communication & education, intra- & inter-professional collaboration, quality & safety domain}, 34 competencies and 130 behaviours	Practice & job evaluation, stakeholder consultation, workshop and expert group review.	Defines competencies required for entry to pharmacy practice in Canada. Used to assess competence at point of licensure. Used to identify learning needs & facilitate CPD.
The RPS Foundation Level Framework (United Kingdom)	The Royal Pharmaceutical Society of Great Britain (RPS, 2014)	4 domains {Patient & pharmaceutical care, professional practice, personal practice, management & organisation domain}, 26 competencies and 90 behaviours	Job-role evaluation, literature & expert review, stakeholders' consultation, and consensus via expert group.	Defines the competencies required for foundation level pharmacy practice in United Kingdom. Used to facilitate the development and training of foundation level pharmacy practitioners. Used to develop tools for work-based assessment of competence.
The RPS Advanced Level Framework (United Kingdom)	The Royal Pharmaceutical Society of Great Britain (RPS, 2013)	6 domains {expert professional practice, collaborative working relationships, leadership, management, education, training and development, and research & evaluation domain}, 34 competencies and 123 behaviours.	Literature review, expert group consultation, consensus via expert group, and profession wide consultation.	Delineates competencies for advanced level practitioners in United Kingdom. Used by practitioners to self-assess & evaluate competence and support portfolio development. Used to identify learning needs & knowledge gaps and facilitate CPD. Used by employers to develop assessment tools. Used by the RPS to support credentialing processes.
The National Competency Standards for Pharmacists in Australia (Australia)	The Pharmaceutical Society of Australia (2010)	8 domains {professional and ethical practice, communication, collaborative and self-management, leadership and management, review & supply medicines, prepare pharmaceutical products, deliver primary and preventive health care, promote & contribute to optimal use of medicines, critical analysis, research & evaluation domain}, 33 competencies and 106 behaviours.	Literature & expert review, and professional-wide consultation.	Defines standard of practice for pharmacists in Australia. Used by the Pharmaceutical Society of Australia to develop education & training programmes for pharmacist. Delineates the performance criteria expected at initial registration, revalidation and restoration of registration. Used by credentialing authorities to aid accreditation of practice. Used by employers to support recruitment and develop assessment tools.
The Advanced Pharmacy Practice Framework (Australia)	The Advanced Pharmacy Practice Framework Steering Committee (APPFSC, 2012)	5 domains {promote and contribute to optimal use of medicines, communication, collaboration & teamwork, leadership & management, professional & ethical practice, critical analysis, research & evaluation domain}, 30 competencies and 114 behaviours	Mapped against the National Competency Standards for Pharmacists in Australia and the RPS-APF, stakeholder consultation, consensus via expert group, and profession-wide consultation.	Defines the professional practice profile of an advanced pharmacy practitioner in Australia. Used to benchmark the specific competencies required for advanced practice. Used to self-assess competence, identify learning needs and facilitate CPD.

Framework (Country)	Organisation/ Author (Year)	Description	Development Process	Summary
Clinical Pharmacist Competencies (USA)	American College of Clinical Pharmacy (ACCP, 2008)	5 domains (clinical problem solving, judgement & decision making, communication & education, medical information evaluation & management, management of patient population, and therapeutic knowledge domain), 18 competencies and 100 behaviours.	Mapped against the ACCP competency standards, literature & expert review, consensus via nominal group.	Delineates core knowledge and skills essential for clinical pharmacy practice. Used to self-assess practice & define CPD needs. Used to develop clinical pharmacy assessment tools.
Entry-level Competencies needed for Community Pharmacy Practice (USA)	National Community Pharmacists Association (NCPA), National Association of Chain Drug Stores (NACDS), and Accreditation Council for Pharmacy Education (ACPE, 2012)	7 domains (pharmacist-delivered patient care, public health, communication skills, dispensing systems management, business management, leadership abilities, and legal consideration domain), and 35 competencies.	Literature review, profession-wide consultation, expert review and consensus.	Defines expectations of practice for community pharmacists in USA. Used to design training curriculum to prepare students for community pharmacy practice. Used to evaluate and assess performance in community pharmacy.
Standard Criteria for Pharmacy Practitioners (Thailand)	Thai Pharmacy Council (2002)	8 domains (knowledge in pharmaceutical manufacturing processes, conduct community health problem & drug needs assessment, prepare extemporaneous pharmaceuticals, conduct a basic health evaluation, provide rational drug use, follow-up, prevent & resolve drug-related problems, provide up-to-date & reliable information, and possess knowledge in pharmacy-related laws domain), and 46 competencies.	Literature & expert review, and profession-wide consultation.	Delineates competencies required for pharmacy practice in Thailand. Used to design training curriculum.
Pharmacy Competency Framework for the Pacific Island Countries	Brown et al (2012)	4 domains (organisation & management, professional & personal, pharmaceutical public health, & pharmaceutical care domain), 23 competencies and 113 behaviours.	Service- and needs-based assessment, literature review, expert and stakeholders' consultation, face-to-face interviews, focus group, and profession-wide consultation via online survey.	Delineates competencies required for pharmacy service delivery in the Pacific Island Countries. Used to support and aid training. Used to evaluate staff performance and effectiveness.
The Global Competency Framework version 1 (Global)	The International Pharmaceutical Federation (FIP, 2010)	4 domains (pharmaceutical public health, pharmaceutical care, organisation & management, and personal & professional domain), 20 competencies and 100 behaviours.	Literature review, expert panel, stakeholders' consultation, consensus development panel, profession-wide consultation via a global online survey.	Delineates core competencies for global foundation level pharmacy practice. Defines expectation for practice. Used as a mapping tool to develop country-specific frameworks. Used to design and develop training curriculum
The Competency Standards for Pharmacists in Singapore (entry to practice)	Singapore Pharmacy Council (2011)	9 domains (promote optimal use of drugs, dispense medicines, compound pharmaceutical products, provide drug information & education, provide primary healthcare, manage drug distribution & supply, apply organisational skills in the practice of pharmacy, practise in a professional & ethical manner, manage work issues & interpersonal relationships domain), 26 competencies and 216 behaviours.	Literature review, expert panel, and stakeholder consultation.	Describes the competencies essential for entry to pharmacy practice in Singapore. Used by practitioners to identify learning gaps and training needs. Used to facilitate pre-registration training programmes, develop assessment tools and aid performance appraisal. Used by employers to support recruitment and conduct induction.
Competence Standards for the Pharmacy Profession (New Zealand)	The Pharmacy Council of New Zealand (2011)	7 domains (practice pharmacy in a professional & culturally competent manner, contribute to quality of use of medicines, provide primary healthcare, apply management and organisational skills, research and provide information, dispense medicines and prepare pharmaceutical products domain), 46 competencies and 151 behaviours.	Literature & expert review, focus group and profession-wide consultation via online survey.	Delineates the competency standards for pharmacy practice in New Zealand. Used to develop training curriculum and define the learning outcomes of such programmes. Used to self-assess and evaluate competence. Used to identify learning needs and knowledge gaps, and to facilitate CPD.

### ***2.1.3.2 Applicability and usability of competency frameworks***

Validation of the frameworks was mainly through evaluation of pharmacists' perception of applicability to practice of the identified competencies. This was primarily via web-based [Bruno, 2011; Atkinson et al., 2015; Jackson et al., 2015], email [Kennie-Kaulbach et al., 2012], or postal [Maitreemit et al., 2008; Obiols, 2008] surveys. Other authors evaluated pharmacists' perceptions via qualitative interviews [Wright and Morgan, 2012].

The ranking of the identified competencies was used as a proxy measure of applicability to practice [Bruno, 2010; Atkinson et al., 2015; Kennie-Kaulbach et al., 2012; Carrington et al., 2012; Maitreemit et al., 2008]. The competencies in the specific frameworks were generally ranked relevant to practice. However, there were disparities in weighting of relevance with some competencies ranked higher than others [Carrington et al., 2011; Kennie-Kaulbach et al., 2012; Maitreemit et al., 2001; Atkinson et al., 2015]. For example, pharmaceutical care competencies were generally ranked higher in relevance in the frameworks while the research-related competencies were ranked lowest (Atkinson et al., 2015; Bruno, 2011; Carrington et al., 2012; Kennie-Kaulbach et al., 2012).

The weighting of relevance also differed in relation to respondents' area of practice [Bruno 2011; Atkinson et al., 2015; Obiols, 2008; Maitreemit et al., 2008; Wright and Morgan, 2012], length of practice (Obiols, 2008) and level of competence [for example, students vs. pharmacy practitioners (Atkinson et al., 2015); and consultants vs. non-consultants (Obiols, 2008)].

Other authors evaluated applicability by assessing usability of the framework in identifying learning needs via practitioner's self- [Carrington et al., 2011; Obiols, 2008; Meadows et al., 2004] or peer assessment [Costello et al., 2013]. Table 2.3 gives a summary of the published studies that evaluated applicability and usability of a specific competency framework in pharmacy.

**Table 2.3: Validation of competency frameworks in pharmacy**

Author (Country)	Method	Summary
Atkinson et al., 2015 (Europe)	Modified Delphi technique via an online survey	Evaluated practitioners' and students' perceptions of the 68 competencies in the Quality Assurance in European Pharmacy Education and Training (PHAR-QA) framework. Respondents (n=1245) used a 4-point Likert scale to rate the relevance to practice of the identified competencies. 70% of the identified competencies were ranked essential to practice. However the weighting of relevance varied with some competencies ranked higher than others. For example, pharmaceutical care competencies were ranked highest while the competencies related to research and production of medicine received the least ranking. The weighting of relevance also differed with respect to area of practice and cadre. For example, community practitioners ranked 22 competencies higher in relevance than industrial pharmacist while licensed practitioners generally ranked the competencies higher than the student respondents.
Kennie-Kaulbach et al., 2012 (Canada)	Modified Delphi technique via an online survey	Evaluated applicability of the 34 competencies identified for primary care pharmacy practice in Canada. Respondents (n=21) ranked the competencies using a 6-point Likert scale. Final results showed all the competencies were essential for practice. However, the weighting of relevance differed with the pharmaceutical care competencies ranked higher in relevance than the research- and education-related competencies which were ranked least.
Bruno, 2011 (Global)	Web-based online survey	Evaluated pharmacists' perception of the 100 behaviours and 20 competencies contained in the FIP Global Competency Framework (GbCF v1). Respondents (n=470) from 64 countries ranked the GbCF v1 competencies on a 4-point Likert scale. Final results showed respondents ranked 90% of the GbCF v1 behaviours as essential for practice. The weighting of relevance differed with respect to area of practice. The pharmaceutical care competencies were ranked least relevant by industrial and academic pharmacy respondents.
Carrington et al., 2012 (Australia)	Email survey	Practitioners (n=35) mapped their practice against the competency framework developed for cancer services in Australia. Study participants self-assessed their practice and ranked the competencies according to relevance to practice. Respondents indicated the competencies were essential to practice but suggested the competencies represented 'ideal' requirements that may not always be demonstrated in practice, particularly in view of time constraints and work load due.
Jones et al., 2012 (United Kingdom)	Email survey	Pharmacy educational and practice supervisors self-assessed their practice using the Competency Framework for Pharmacy Educational and Practice Supervisors in United Kingdom. Final results indicated the participants (n=10) were able to map their practice against the competencies in the framework. Participants however expressed difficulties with understanding some of the terminologies used in the framework. They also reported the framework was lengthy and time consuming to complete.



Author (Country)	Method	Summary
Maitreemit et al., 2008 (Thailand)	Postal survey	Evaluated pharmacists' perceptions of the competencies in the Standard Criteria for Pharmacy Practitioners in Thailand framework. The competency standard contained 7 domains and 46 competencies. Study participants used a 5-point Likert scale to rank relevance to practice. Final results showed all the identified competencies were relevant to practice but with specific inter-practice differences in weighting of relevance. For example, community pharmacists ranked the management skills competencies higher in relevance than hospital pharmacists while industrial pharmacists ranked the pharmaceutical care competencies lower in relevance than hospital and community practitioners.
Meadows et al., 2004 (United Kingdom)	Email survey to develop consensus via an expert panel	Practitioners (n=28) evaluated usability of the Advance to Consultant Level Framework (AcLF, now renamed the RPS-APF) via self-assessment of practice. The framework contained 6 clusters and 34 competencies. At the end of the study, all the practitioners were able to map their practice against the competencies in the framework. Practitioners however ranked their practice comparatively higher for two of the six clusters. These were the 'expert practice' and 'building working relationships' clusters.
Obiols, 2008 (United Kingdom)	Postal survey	Evaluated the applicability of the AcLF competencies to pharmacy practice. The study also aimed to define the practice profile of consultant pharmacists using the framework. Advanced pharmacists in United Kingdom (n=390) self-assessed their practice using the framework. Final results showed the participants were able to map their practice against the framework. The results also aided the identification of the practice profile of consultant and non-consultant level practitioners and provided information on the types of evidence needed to support assessment. Qualitative interviews (n=12) indicated practitioners generally found the framework to be applicable to their practice. Practitioners also indicated that the framework clarified expectations of practice and aided identification of knowledge gaps and learning needs. Participants however reported they found the framework lengthy and time consuming to complete.
Wright and Morgan, 2012 (United Kingdom)	Qualitative interviews	Evaluated pharmacists perceptions of the AcLF competencies. Participants (n=136) generally found the framework useful for practice and reported that the AcLF provided a structure for practice advancement. They however expressed scepticism with regards to the feasibility of demonstrating all the competencies within the limits of the practice environment.
Costello et al., 2013 (Australia)	Thematic analysis approach	A retrospective and comparative evaluation of learning needs identified via a competency framework and its correlation with the objectives of an employer-led up-skilling workshop. The objectives of the up-skilling workshop were designed based on the results of a prior peer-evaluation involving 30 early career practitioners. The researchers reviewed 220 peer evaluations that identified learning needs and made CPD recommendations with the aid of a modified General Level Framework (now renamed the RPS Foundation Level Pharmacy Framework). These evaluations were compared with the objectives of the up-skilling training workshop. The results showed the identified learning needs correlated with the learning objectives of the workshop. It also showed the GLF was useful for identifying learning needs and designing training workshop learning objectives.

### ***2.1.3.3 Effectiveness of competency frameworks***

Seven longitudinal studies included in this review demonstrate significant improvement in pharmacists' performance when competency frameworks are used to evaluate performance, identify knowledge gaps and tailor learning activities. Observable and significant improvement from baseline performance occurred after three months (Goldsmith et al., 2001), six months (Svetlana et al., 2014; Antoniou et al., 2005; Coombes et al., 2010), nine months (Rutter et al., 2012), or twelve months (Mills et al., 2008; Meštrović et al., 2012) with the use of the respective frameworks.

Three of the studies were comparative studies (Antoniou et al., 2005; Mills et al., 2008; Goldsmith et al; 2001) and the results showed rapid and sustained improvement in pharmacists' performance with the use of a competency framework. The study by Goldsmith et al (2001) showed there was no observable improvement in performance in the control group that partook in an employer-led training programme not involving the use of a framework. The studies by Antoniou et al (2005) and Mills et al (2008) showed improvement in performance for both the intervention and control group, although this was more significant and sustained in the intervention group with a statistically significant difference observed between the groups ( $p < 0.001$ ).

A study by Brown and colleagues (2015) also demonstrated improvement in performance after a four-day competency-based training workshop as well as a positive change in perception and participants' self-assessed understanding of the essential competencies required for effective practice.

Taken together, the seven studies provide evidence that competency frameworks aid improvement in pharmacy performance, support the identification of knowledge gaps and learning needs, and also facilitate CPD.

Table 2.4 gives details of the design and findings of the seven studies.

**Table 2.4: Effectiveness of competency frameworks in pharmacy**

Author (Country)	Study design	Main Findings	Study Conclusion
Antoniou et al., 2005 (United Kingdom)	Multicentred randomised control study in the United Kingdom with an intervention (n=74) and control (n=30) arm. Study participants were early career pharmacists and the intervention involved the use of the RPS Foundation Level Framework (FLF) to aid practice development. The FLF was initially used to define expected competency level and training needs. It was also used to evaluate baseline performance. Subsequent performance assessment using a 4-point Likert scale was conducted at 3, 6 and 12 months. The control group had no access to the FLF.	At 6 months, pharmacists in the intervention group showed improvement in performance for 24 (96%) of the competencies while the control group showed improvement in 7(28%) of the competencies. This performance improvement was sustained at 12 months for the intervention group in contrast to the control group which showed overall improvement in 12 (48% ) of the competencies. At the end of the study, there was a significant difference in competency attainment between the two groups at 3, 6, and 12 months (log rank = 7.97, p=0.0048).	The framework aided the identification of learning needs with a significant improvement in pharmacists' performance observed after 6 months. This improvement was sustained until the end of the 12 months study period. The likelihood of competence attainment was higher with the framework compared to usual training.
Coombes et al., 2010 (Australia)	Observational study which involved using a modified FLF to assess performance and identify learning needs for 66 pharmacists in Australia. The FLF was adapted to the health needs in Australia via an expert group review. A 7-point Likert scale was used to assess and rate the frequency at which each of the competencies in the FLF was demonstrated with tailored feedback provided at baseline. A repeat assessment was then conducted at a later date (t=5 - 22months after initial assessment) and the mean competency score compared with baseline.	Final study results showed there was a significant improvement in pharmacists' performance for 57% of the competencies (P≤ 0.05) in the framework.	Use of FLF aids the identification of learning needs and supports performance improvement.
Meštrović et al., 2012 (Croatia)	Longitudinal prospective cohort study involving 100 community pharmacists in Croatia. Used a modified FLF adapted to the needs of Croatia via an expert panel review. The modified FLF was then used to tailor educational programmes for the development of competence in patient care. Subsequent overt observation of performance was then conducted at 12 months and compared to baseline using a 4-point Likert scale to rate frequency at which each patient care competency was demonstrated.	Study participants demonstrated improvement in all of the 26 behaviours assessed for the patient care competency cluster with significant difference found between the mean behaviour scores at baseline and at 12 months (p< 0.0001).	Competency framework aid identification of learning needs, and supports the design and development of individualised training activities. It also facilitates improvement of pharmacists' performance.
Rutter et al., 2012 (Singapore)	Observation study of pharmacists in Singapore (n=35) using a modified FLF to assess and evaluate competence at two time points over 9 months. The FLF wa adapted to the health needs of Singapore via an expert group review. After initial assessment, feedback on training needs was given by the assessor with an individual learning plan formulated for each participant. A second assessment was then conducted at 9 months using a 7-point Likert scale to assess the rate at which each competency was demonstrated according to standard.	Improvement in mean competency cluster score was observed for all three competency cluster of the FLF with significant improvement in 55 (87%) of the 63 behaviours assessed (p < 0.05).	Use of a modified FLF facilitates performance improvement in pharmacists.

Author (Country)	Study design	Main Findings	Study Conclusion
Mills et al., 2008 (United Kingdom)	Two arm study having both an intervention and control group. Study participants were community and primary care pharmacists. The intervention (n=69) involved the use of the FLF to self-assess practice level at baseline, identify individual learning needs, and aid practice development over a 12 month period. The FLF was adapted to the needs to country needs via an expert group. Participants in the control group (n=31) did not use the FLF and they undertook the standard training provided by their employers.	Significant increase in the self-assessed competency scores was observed at 12 months for 14 (58%) competencies in the intervention group. Pharmacists in the intervention group demonstrated a more rapid improvement in performance compared to the non-intervention group (p<0.001).	The FLF supports the identification of learning needs and promotes more rapid improvement in performance compared to usual training without a framework.
Svetlana et al., 2014 (Serbia)	An observation study involving 32 community pharmacists in Serbia. Performance was assessed at two time points using a modified FLF. A 4-point Likert scale was used to assess and rate the frequency at which each of the competencies in the FLF was demonstrated with tailored feedback provided at baseline. A second assessment was then conducted after 6 months with the two results compared.	A significant increase in mean competency score from baseline was observed for 23 (88%) competencies at the end of the study (p < 0.05).	The modified FLF supports structured performance evaluation via a check list of the competencies and also aids performance improvement.
Goldsmith et al., 2001 (United Kingdom)	An observational study of pharmacists' performance involving two arms: an intervention and control group. Study participants were hospital pharmacists in eight active and one control site. The intervention (n=24) involved the use of the FLF to assess performance using a 4-point Likert scale with feedback provided at baseline. A second assessment was conducted after 12 weeks. Participants in the control group (n=4) underwent standard training provided by employers with performance assessed at baseline and after 12 weeks. Qualitative interview of the study assessors (n=20) was also conducted to determine usability and ease of use of the framework.	The intervention group showed significant improvement in performance for 23 (96%) competencies in the FLF after 12 weeks (Wilcoxon, P =0.047 to P<0.0001). There was no improvement observed in the control group. Interviews with the tutors indicated the framework had "brought up participants practice quicker", meaning the framework facilitated significant improvement within a shorter time span than usual training.	The FLF aids identification of learning needs and promotes more rapid improvement in performance compared to usual practice.
Brown et al., 2015 (Pacific Island Countries)	An observational study of performance and perceived level of competence. Study participants were primary care health professionals including pharmacists, nurses, and other allied health personnels (n=59). The study subjects participated in 15 skills-based learning workshops over four days. The workshop involved a number of learning activities including group discussions, role plays and six skills-based work stations. The activities were designed to facilitate learning of medicine supply competencies selected from the Essential Medicine Supply Management (EMSM) Competency Framework. Performance on the work stations were assessed before and after each skills-based training by an assessor using a 5-point Likert scale. The study participants also self-assessed their perception of the EMSM competencies before and after the workshop.	Improvement in performance was observed at the end of each learning activity as shown by an increase in mean competency score for the six skills-based stations [t= 3.921 to 5.258; p<0.0001]. There was also a positive change in perception about the EMSM competencies with participants indicating that the training aided and improved their understanding of the requirement for practice.	Competency framework support the design and development of learning activities that in turn aid improvement in performance.

#### **2.1.3.4 The assessment of competence**

The studies included in this review mainly assessed competence by evaluating performance through peer-assessment. This involved direct observation of procedural skills for specific competency-based tasks (Antoniou et al., 2005; Coombes et al., 2010; Goldsmith et al., 2003; Meštrović et al., 2012; Mills et al., 2008; Rutter et al., 2012; Svetlana et al., 2014). Other studies involved the use of a competency framework to self-assess practice (Carrington et al., 2011; Jones et al., 2012; Kennie-Kaulbach et al., 2012; Meadows et al., 2004; Obiols, 2008) or evaluate understanding and confidence in carrying out the specified task (Brown et al., 2015).

The studies showed that pharmacists generally rated their practice higher in pharmaceutical care-related competencies than research-related competencies (Kennie-Kaulbach et al., 2012, and Carrington et al., 2011). The study by Obiols (2008) showed that some of the pharmacists underestimated their competence particularly in the expert professional practice and leadership domains. Also, some of the pharmacists in these studies were skeptical about the feasibility of demonstrating the identified competencies within the limit of the practice environment (Carrington et al., 2011, Obiols, 2008, Wright and Morgan, 2012).

Two other studies evaluated pharmacists' perceptions and preferred method of competence assessment (Jackson et al., 2015a; Joint Partners Credentialing Task Group (JPCT), 2013). The results indicate a high preference for self-assessment, peer-review of a practice portfolio, and workplace peer-assessment with multisource feedback. Objective Structured Clinical Examination (OSCEs) and multichoice question examinations were the least preferred assessment methods identified by these surveys.

#### **2.1.4 Discussion**

The systematic literature review included one global and 12 national competency frameworks that contained generic pharmacy practice competencies (Table 2.2). The national frameworks were from 9 countries and were mainly identified via manual search of FIP member organisation websites. The website search was directed by the results of a 2012 and 2014 survey of FIP member organisations by *FIPed* which showed that 31 countries have either

developed and implemented or were in the process of developing a national competency framework for pharmacy practice (International Pharmaceutical Federation, 2014).

The FIP membership list was consulted to retrieve the web addresses of the representative member organisation in these countries. Consequently, 35 organisation website which were in English language were then visited and searched. The manual website and systematic literature search yielded nine national frameworks that delineated the competencies required for foundation level pharmacy practice, and three frameworks containing advanced level competencies. The search also yielded the FIP Global Competency Framework for foundation level pharmacy practice (GbCF v1).

Specialty- or role-specific frameworks were also retrieved from the manual and systematic literature search. These frameworks were however not included in the review since they were developed with the aid of some of the identified national frameworks and also contained non-generic competencies that were only applicable to a defined role or specialty. Examples of such frameworks were the Leadership Competency Framework for Pharmacy Professionals in the United Kingdom (Royal Pharmaceutical Society of Great Britain, 2010); the Standards and Guidance for Pharmacy Prescribers in Northern Ireland (The Pharmaceutical Society of Northern Ireland, 2013) and the Framework for Pharmacists-assisted Medication Review in the USA (Wiener et al., 2015).

However, two competency frameworks from USA— the American College of Clinical Pharmacists (ACCP) Clinical Pharmacy Competencies (American College of Clinical Pharmacy, 2008b) and the Entry-level Competencies needed for Community Pharmacy Practice (National Community Pharmacists Association et al., 2012)— that contained specific competencies for clinical and community pharmacy practice, respectively, were included. This was because the ACCP framework contained competencies applicable to advanced pharmacy roles in different specialties including oncology, critical care, nutritional support pharmacy and other pharmacotherapy areas. The Entry-level Competencies for Community Practice in the USA framework was included because it contained competencies that contributed to undergraduate pharmacy learning curriculum in the USA.

Specialty-specific competency frameworks that reported developmental and validation methods were also included in the review. These included the frameworks for oncology pharmacy in Australia (Carrington et al., 2012), a framework for primary care pharmacy in Canada (Kennie-Kaulbach et al., 2012), and the Pharmacy Educational and Practice Supervisors Framework in the United Kingdom (Jones et al., 2012).

Evidence from the literature included in this review indicates that competency frameworks in pharmacy are mainly developed and validated via similar evidence-based methodologies. Frameworks were developed via a combination of literature and expert review, stakeholder consultations, consensus development via a nominal group or modified Delphi technique, and profession-wide consultation via surveys or qualitative interviews.

In general, the literature review conducted to identify competencies also involved framework mapping via content analysis of other country-specific frameworks. For example:

- The RPS Foundation Level Framework (formerly called the General Level framework) was one of the mapping tools used to aid the development of the Competency Standards for Pharmacists in Singapore (Singapore Pharmacy Council, 2011). It was also used as a source document to develop country-specific frameworks applicable for early career pharmacy practice in Croatia (Meštrović et al., 2012), Serbia (Svetlana et al., 2014), Australia (Coombes et al., 2010), and Singapore (Rutter et al., 2012).
- The RPS Advanced Pharmacy Framework [formerly called the Advanced to Consultant Level Framework (AcLF) and the Advanced Pharmacy Practice Framework in Australia were developed from similar bibliographic sources (Jackson et al., 2015b; The Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012). The RPS Advanced Pharmacy Framework was also used a source document to develop the Framework for Cancer Services in Australia (Carrington et al., 2012).
- The FIP Global Competency Framework (GbCF v1) was used as a mapping tool to aid the development of the Pharmacy Competency Framework for the Pacific

Island Countries (Brown et al., 2012), and the Core Competency Framework for Pharmacists in Ireland (The Pharmaceutical Society of Ireland, 2013).

This indicates the existence of a common set of competencies that are applicable for pharmacy practice in different countries. It corroborates similar evidence from the study by Bruno (2011) that demonstrates the relevance of the FIP GbCF v1 competencies to foundation level pharmacy practice in 64 countries.

Framework validation mainly involved self-assessment of practice, peer-evaluation of performance using a competency framework, or surveys of pharmacists' perception of the identified competencies (Table 2.2 & 2.3). The outcome of the validation studies indicate that while pharmacy practitioner generally perceived the identified competencies to be relevant to practice; the weighting of relevance of these competencies differed with respect to area of practice (Atkinson et al., 2015; Bruno, 2011; Maitreemet el al., 2008; Kennie-Kaulbach et al., 2012), level of competence and length of practice (Atkinson et al., 2015; Obiols, 2008; and Meadows et al., 2004). For example, three studies demonstrate that pharmacists generally perceived research-related competencies to be of low relevance to practice (Kennie-Kaulbach et al., 2012; Carrington et al., 2012; Atkinson et al., 2015).

The relevance ranking of research-related competencies also differed with respect to area of practice (Bruno, 2011), level of competence and length of practice (Obiols, 2008). The study by Bruno (2011) showed that both patient-facing and non-patient facing sectors including hospital, industrial and academic pharmacy practice areas perceived the research-related competencies as not relevant to practice. Qualitative interviews showed that pharmacists identified time constrains and workload as barriers to participating (Kennie-Kaulbach et al., 2012) and demonstrating research-related competencies in daily practice (Jones et al., 2012; Wright and Morgan, 2012; Carrington et al., 2012)

Evidence from some of the studies included in this review show that competency frameworks facilitate rapid performance improvement of pharmacy professionals compared to training undertaken without a framework (Goldsmith et al., 2001; Antoniou et al., 2005; Mills et al., 2008). The studies also show that when frameworks are used to clarify the expectations of practice, it aids identification of learning needs (Costello et al., 2013) and in so doing,



supports competence development (Coombes et al., 2010; Meštrović et al., 2012; Rutter et al., 2012; Svetlana et al., 2014).

The study by Brown and colleagues (2015) demonstrated improvement in performance when a competency framework was used to tailor a training programme for healthcare professionals including pharmacists. It also showed a positive change in perception with an improvement in practitioner understanding and confidence in ability to demonstrate the essential competencies in daily practice. This corroborates evidence from Obiols (2008) and Wright and Morgan (2012) that show that competency frameworks facilitate CPD and provide a structure for professional and practice development.

### **2.1.5 Limitations**

Study design was a key limitation of most of the studies included in this review. Only three studies were randomised control trials involving an intervention and control group (Goldsmith et al., 2001; Antoniou et al., 2005; Mills et al., 2008). This makes it difficult to determine if the improvement in performance observed in the other studies were purely due to the frameworks and not due to 'time-effects' on performance. Also, the number of participants in the control group in the study by Goldsmith and colleagues (2001) was very low (n=4) and likely influenced the inability to observe any measurable change in performance. This feature hampers the generalisability of the findings of this study.

External validity was also limited by the low response rate observed in some of the included studies. These studies mainly had sample size ranging from 10 to 35 participants, potentially limiting the generalisability of the study findings to the wider population (Jones et al., 2012; Goldsmith et al., 2001; Rutter et al., 2012; Carrington et al., 2012; Kennie-Kaulbach et al., 2012).

The convenience sampling approach used in most of the studies in this review (Meadows et al., 2004; Kennie-Kaulbach et al., 2012; Carrington et al., 2012; Jones et al., 2012) also hampers generalisability of the findings, particularly because the views of the study

participants may not be representative of the target population. Also, there were inconsistencies in performance assessment in the study by Coombes et al., (2010) given that the time frame for the second assessment was not the same for all the participants in the study. Some participants were assessed after five months while some were assessed after twenty-two months. This feature affects the reliability of the final result and overall conclusions of the study.

In general, the eight studies that evaluated the effectiveness of competency frameworks all used the General Level Framework (GLF) [renamed the RPS Foundation Level Framework] or a modified GLF to evaluate pharmacists' performance (Coombes et al., 2010; Rutter et al., 2012; Meštrović et al., 2012; Mills et al., 2008; Antoniou et al., 2005). This makes it difficult to conclude that other competency frameworks will aid similar improvement in performance.

### **2.1.6 Conclusion**

Dissatisfaction with the outcomes of knowledge-based education training models in the health professions has been one of the drivers for promoting competency-based education and training (Albanese et al., 2007; Frank et al., 2010; Gruppen et al., 2012). However, accurate assessment of competence depends on the use of an appropriate performance standard or criteria. It is therefore imperative that the standard against which individual performance is to be judged is defined.

In spite of the limitations in some of the studies included this review; the overall finding from the review suggest that competency frameworks aid the identification of learning gaps, supports practitioner development and may provide an avenue for defining standards and expectations of practice. Evidence from the literature included in this review demonstrates the applicability and usefulness of competency frameworks in defining performance indicators and tailoring assessment strategies for both formative and summative competence assessment.

## 2.2 Research Questions

FIP Education Initiative (FIPEd) aims to provide evidence-based development solutions that support performance and quality improvement of the global pharmacy workforce (International Pharmaceutical Federation, 2010). In line with this goal, one of the strategies advocated by FIPEd is the need to define and articulate the competencies that pharmacists require to consistently perform in a safe, effective and efficient manner. The aim is to provide a tool that delineates the expectations of practice for the global pharmacy workforce (Bruno et al., 2010).

Evidence from the studies included in the systematic literature review conducted for this research and reported in this thesis show that competency frameworks aid performance improvement and support practice development. In line with evidence, FIPEd in 2010 developed a global competency framework (GbCF v1) that provides guidance on the practice-based expectation of the global pharmacy workforce. The framework was developed specifically for the early career practitioners (International Pharmaceutical Federation, 2010). An ongoing online survey of pharmacists' perception of the competencies and behaviours in the framework demonstrates the relevance of the GbCF v1 competencies for practice in 64 countries. Data from resource-limited settings like countries in Africa were however lacking from this online survey and further research on validity of the framework in this region is therefore necessary. Also, the validation of the framework in these 64 countries demonstrates the feasibility of defining the pharmacy practice competencies that are globally applicable. Further work is therefore necessary to define the competencies that are applicable for the global advanced pharmacy workforce.

The following questions were developed for this research:

- I. Are the competencies and behaviours in the FIP Global Competency Framework (GbCF v1) relevant to pharmacy practice in countries in Africa?
- II. Are there core competencies for advanced pharmacy practice?
  - a) Would such competencies be applicable to advanced practitioners from different countries?

- b) Can a global competency framework for advanced pharmacy practice be developed from these competencies?

### **2.3 Aims and Objectives**

The aim of the first study is to evaluate pharmacists' perception of relevance to practice of the competencies contained in the FIP Global Competency Framework (GbCF v1), focusing specifically on countries in Africa.

The objectives are:

- To identify the competencies in the GbCF v1 that are relevant for pharmacy practice in fourteen countries in Africa.
- To delineate these identified competencies by area of pharmacy practice.

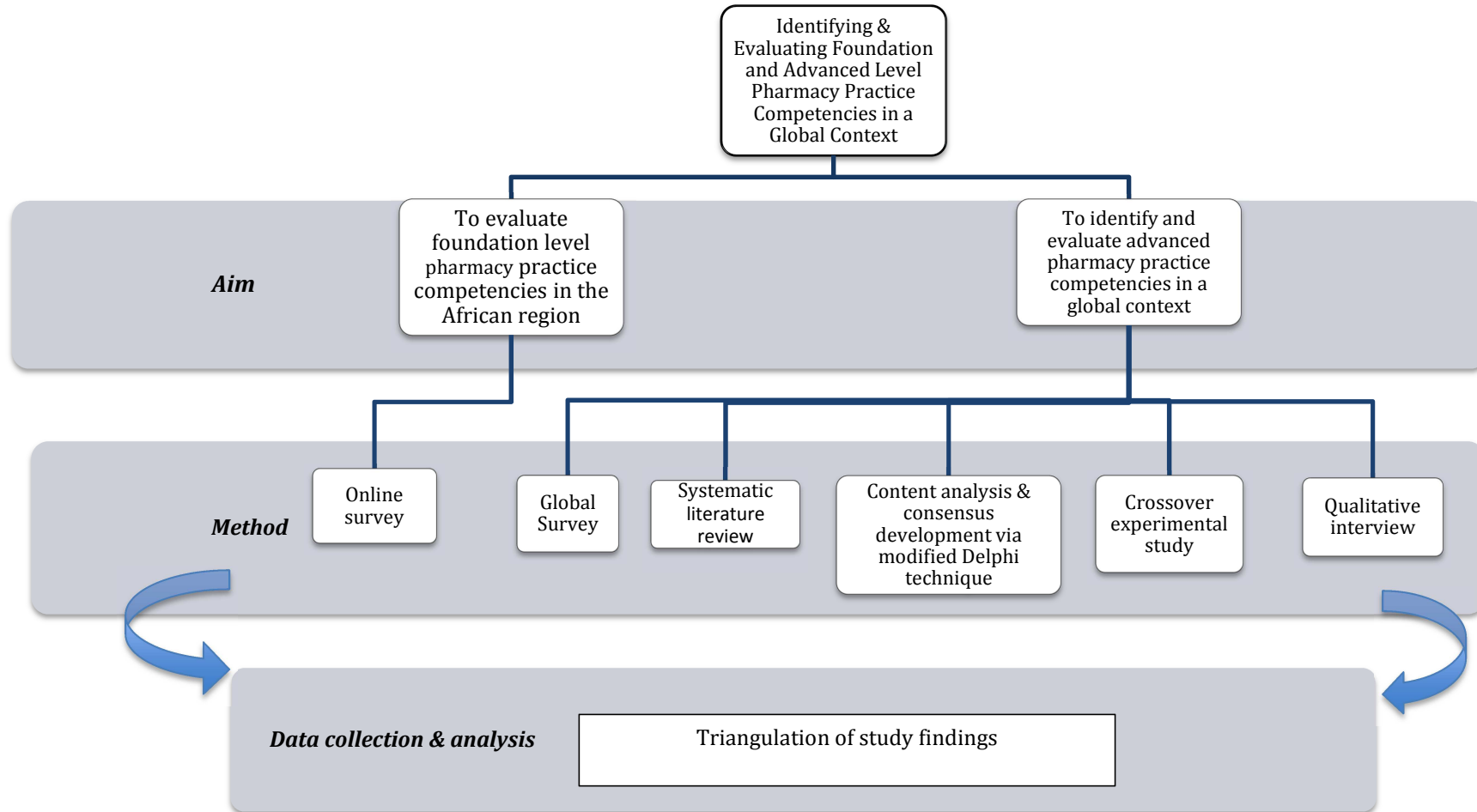
The fourteen countries included in this research were selected based on availability of contact persons and willingness to participate of the respective national leadership organisations in the countries.

The aim of the second study is to identify and evaluate the competencies that are relevant for global advanced pharmacy practice.

The objectives are to:

- To identify the competencies required for advanced pharmacy practice as defined by different countries around the world;
- To examine and review these competencies and identify the core advanced practice competencies therein;
- To determine the relevance of these competencies to advanced practitioners in different countries.

**Figure 2.1: Research Framework**



## **2.4 Ethical consideration**

Formal ethical approval from the research ethics committee was not required for this research given that none of the two studies conducted involved the use of identifiable patient information or data (guideline available at <http://ethics.grad.ucl.ac.uk/exemptions.php>). The two studies rather recruited pharmacists and sought their views by virtue of their professional roles.

However, good research practice was adhered to at all times. An anonymised online questionnaire was used in the first study (chapter 3; Appendix 5) and informed consent was sought from each of the participants prior to enrollment in the crossover experiment conducted in the second study (Chapter 4; Appendix 7). Study participants were provided with advance information on the requirement of the online survey via an invite (Appendix 1), one-page flyer (Appendix 2) and cover letter (Appendix 5). In the second study, participants were informed of the structure and content of the expert panel (Appendix 14), crossover experiment (Appendix 6) and interview (Appendix 10) prior to participation.

Participation was voluntary and confidentiality maintained at all times with comments remaining anonymous. All data collected in the research were stored in an encrypted database with hard copies kept in locked filing cabinets at the Department of Practice & Policy, UCL School of Pharmacy, United Kingdom. Access to study data was restricted to the three researchers directly involved with the study.

## **Chapter 3 EVALUATING FOUNDATION LEVEL PHARMACY PRACTICE COMPETENCIES IN AN AFRICAN CONTEXT**

### **3.1 Study Rationale**

The central role pharmacists' play within the health system underpins the necessity for a competent and highly skilled workforce that is equipped with the requisite knowledge and skills relevant to population health needs. This is of particular importance in resource-limited settings like sub-Saharan Africa where severe workforce shortages hamper access to health services.

Competencies refer to the knowledge, skills and behaviours that professionals need in order to practice to acceptable standards. Studies show that when competency frameworks are used alongside standards of practice, it facilitates improvement of pharmacists' performance (Antoniou et al., 2005; Coombes et al., 2010; Rutter et al., 2012; Svetlana et al., 2014), promotes the attainment and maintenance of fitness to practise (Meštrović et al., 2012; Svetlana et al., 2014), aids identification of knowledge gaps and learning needs (Meštrović et al., 2011), and fosters continuing professional development (Brown et al., 2015; Mills et al., 2008). Consequently, the use of competency frameworks to benchmark standards of practice and support practitioner development has become a feature of professional practice in pharmacy, and in the health professions globally.

In 2010, the International Pharmaceutical Federation Education Initiative (FIPEd) developed a global competency framework (GbCF v1) for foundation level pharmacy practice (International Pharmaceutical Federation, 2010). This framework was designed to provide guidance on the practice-based expectation of the global pharmacy workforce. It was developed specifically for early career practitioners (Bruno et al., 2010).

Evidence from an ongoing online survey that commenced in 2010 and generated 470 replies, has demonstrated the relevance of the GbCF v1 competencies and behaviours to pharmacy practice in 64 countries (Bruno, 2011). However, respondents from countries in Africa comprised only 12.3% of the sample in the survey. This present study was designed to determine the relevance to practice of the competencies and behaviours contained in the GbCF v1, focusing on countries in Africa. The overall goal is to evaluate the GbCF v1 in an

African context and assess its validity for use as a tool for developing country-specific frameworks in the region.

The following section will give details of the specific research methodologies used in this study including the sampling, data collection, data analysis methods and the study findings. Discussion of the study findings is also presented in this chapter while the implication for practice and overall conclusions of this research are provided in Chapter 5.

## **3.2 Methodology**

An online cross-sectional survey of pharmacists practising in countries in Africa was used in this research. The suitability and rationale for the choice of this survey method include:

- Its comparatively lower cost compared to postal and interview surveys
- The possibility of obtaining relatively faster responses compared to postal surveys
- The possibility of obtaining replies from target population irrespective of geographical location compared to postal survey
- Ease of data handling, especially since the data generated from online surveys are less cumbersome to handle and analyse given that the questionnaire replies are automatically coded and uploaded directly on to the research database
- The possibility of using pop-up question prompts in online surveys that ensure that questionnaires are less likely to be filled incompletely.

### **3.2.1 Sampling**

A convenience and snowball sampling method was used in the study. Assistance with the project was sought and obtained from the media team of the International Pharmaceutical Federation (FIP). The media team assisted by disseminated the survey invite centrally via email to the FIP member organisations in Africa. These organisations were the twenty-four out of the 35 umbrella bodies representing pharmacists from twenty-three African countries (appendix 3). The organisations that indicated willingness to participate and gather data were included in the study.

Contact persons within each of the selected organisations were specifically requested to assist with the project by distributing the survey invite to their members. The invite was also



forwarded to individual FIP members from countries in Africa. Initial mailing of the invite was carried out on 21 November 2012. Email reminders were thereafter forwarded monthly until the end of the study on 20 December 2014.

The survey invite was also disseminated through the FIP United Nations Education Scientific and Cultural Organisation (UNESCO) University Twining Network (FIP/UNITWIN) in Africa. Invitation to assist with the project was extended to the FIP/UNITWIN country-level contact persons during the FIP-Country Case Studies Mini Summit that held in Ghana between 2<sup>nd</sup> and 3<sup>rd</sup> of March 2013. Contact persons representing five African countries (Namibia, Nigeria, Ghana, Uganda and Zambia) present at this summit consented to assist with the project in their respective countries.

The survey invitation was forwarded via email to these contact persons on the 11<sup>th</sup> of March 2013 for onward distribution through their respective membership mailing lists. Confirmation of email distribution was received and a monthly reminder email was thereafter forwarded through the same means until the end of the data collection period.

Social media was also used in this study. Online groups and forums of pharmacists from Nigeria, Uganda, Kenya and South Africa were identified on Facebook®. The administrators listed for these groups were sent a direct message and invited to assist with the project. Reply and consent to assist was received from twelve group administrators (list provided in appendix 4). The survey link was then sent as a private message to these administrators for onward dissemination to group members via their respective Facebook® group timeline.

The survey invite containing the URL was further customised and disseminated via Twitter® and Blackberry Messenger® (BBM). Users of these two platforms who were pharmacists were purposively selected via the FIP followers' list. These individuals were contacted directly via the direct messaging service of Twitter® and BBM. They were also invited to assist with the survey by 're-tweeting' the URL on Twitter, and/or 'broadcasting' the survey invite via BBM. Also, survey respondents were encouraged to assist with the project by forwarding the email invite containing the URL to their colleagues and contacts. Onward dissemination of the survey invite via all the aforementioned media created a chain/snow ball sampling method.

### **3.2.2 Sampling frame and sample size**

A sampling frame was not possible for this study. This was because of a lack of access to country-level membership list due to confidentiality and data protection laws of the United Kingdom. Also, although the FIP-RPS Global Pharmacy Workforce Observatory that was launched in 2013 provides data on the number of registered pharmacists for most countries around the world, this information was not available for many African countries at the time this study was designed in 2012 (International Pharmaceutical Federation (FIP), 2015; The Royal Pharmaceutical Society of Great Britain and International Pharmaceutical Federation, 2013). As a result, it was not possible to precisely and accurately estimate an optimal sample size *a priori*. Therefore, a non-probabilistic sample obtained via a convenience and snowball sampling technique was used.

### **3.2.3 Survey questionnaire**

An online questionnaire (appendix 5) developed and validated in a previous study by Bruno (2011) was used in this research. The questionnaire, which was wholly reproduced from the GbCF v1 and available at <http://www.codegnet.org.uk/gbcf/>, comprised six pages and contained 105 questions. The first page was a cover letter that provided an overview of the study, including guidance on completing and submitting the questionnaire. The second page contained five demography-related questions that collected data on country of residence, length of practice, gender and area of pharmacy practice. Each of the four clusters in the GbCF v1 had its corresponding competencies and behavioural statements presented on one page. This means the four clusters in the framework were presented on four pages.

Respondents were required to rank their agreement with the 100 GbCF v1 behavioural statements (hereafter referred to as 'behaviours') using a four point Likert scale. This means respondents were required to indicate whether each of the behaviours was 'highly relevant', 'relevant', of 'low relevance' or 'not relevance' to their practice. A separate editable text box for comments was provided at the end of each cluster.

### 3.2.4 Response rate

The choice of an appropriate survey method suitable to the survey sample determines the response rate achieved (de Vaus, 2002). Response rate is calculated as a percentage of the total eligible study population who successfully complete the survey.

The formula for calculating response rates is given as:

$$\text{Response rate} = \frac{\text{Number returned}}{\text{N in Sample} - (\text{ineligible} + \text{unreachable})} \times 100$$

However, it was not possible to calculate the response rate in this study for a number of reasons:

- Information on the total number of pharmacists represented by each of the FIP member organisation from Africa was not available. Some countries had more than one professional body registered with FIP (for example, Egypt) and the exact number of pharmacist represented by these different organisations could not be obtained. It was also not possible to obtain such precise information directly from the different professional pharmacy groups that were contacted for this study.
- Second, it was not possible to have direct access to all the pharmacists practising in countries in Africa. As a result, this research relied on contact persons within the various membership organisations to facilitate the distribution of the survey invitation to individual members. In using this approach, it was not possible to determine the total number of pharmacist that had received the email invite per country. As a result, the number of non-responders could not be ascertained and the response rate could also not be calculated.

#### 3.2.4.1 Strategy used to boost responses in this study

Advance letters, cover letters and reminder emails were the specific strategies used to boost survey responses. The first page of the survey questionnaire contained a cover letter that provided details of the survey and guidance on how to complete the questionnaire.

Prior to the implementation of the online survey, advance information about the project was presented at the Annual Global Deans Forum organised by FIPed as well as at the academic pharmacy sessions and events during the FIP World Congress of Pharmacy and Pharmaceutical Sciences, at Amsterdam, Netherlands, 3-8<sup>th</sup> of October 2012. The following year, a 'flyer' containing information about the project was also distributed at the FIP conference that held at Dublin, Ireland on the 31<sup>st</sup> August to 5<sup>th</sup> September 2013 (Appendix 2).

Country level contact persons identified through FIPed were also approached for assistance with the project via emails and/or face-to-face meeting at the 2012 & 2013 FIP conferences. Monthly reminder emails were routinely disseminated via the various contact persons and centrally through the FIP member organisations for onward distribution to individual members.

### **3.2.5 Data handling and analysis**

Replies to the survey questions were automatically coded and uploaded on to a dedicated database for further analysis. The data obtained were then cleaned and reviewed for errors by taking a random 10% of the survey replies. This meant that 50 of the survey replies in this study were randomly chosen and reviewed systematically to check for missing values and errors. Missing values were replaced with the code 999 to ensure accurate data analysis.

For the purpose of analysis and to ensure the results produced could be meaningfully interpreted, the four point Likert scale was aggregated into three categories. The 'highly relevant' and 'relevant' ratings were condensed into one category: 'relevant', while 'low relevance' and 'not relevant' ratings remained separate categories. The data were then recoded as 'not relevant' =1; 'low relevance' =2; while 'relevant' plus 'highly relevant' =3. Respondents' ranking of each of the 100 GbCF v1 behaviours was used to evaluate overall agreement in the survey.

Frequencies and percentages were used to analyse demographic data. Inferential analysis was conducted using the Pearson's Chi Square ( $X^2$ ) test to assess homogeneity of survey replies. The test was also used to evaluate the relationship between survey responses, and respondents' area of practice, and length of practice. Multivariate analysis was used to

evaluate respondents' ratings in relation to country of origin. Details of the operationalisation of the analysis are given in the results section of this chapter.

### 3.3 Results

#### 3.3.1 Demography

At the end of the online survey, 469 replies were received from 14 African countries. These countries were: Ethiopia (1), Ghana (93), Kenya (103), Nigeria (166), Tanzania (1), Zambia (15), Egypt (8), South Africa (64), Zimbabwe (5), Namibia (1), Uganda (3), Sudan (1), Lesotho (3), and Tunisia (5).

The study sample comprised 54% females. Respondents in hospital practice accounted for 56.7% of the sample, followed by community (15.6%) and academic (9.2%) pharmacy practice. Table 3.1 gives a summary of the overall distribution of survey replies in relation to area of pharmacy practice.

The average length of practice in the survey was 7.7years (S.D  $\pm$  8.1years). Maximum length of practice was 43years. Respondents with less than five years of post-registration practice comprised 47% of the sample while pre-registration candidates (intern pharmacists) comprised 5.5% of the sample.

**Table 3.1: Distribution of responses by area of practice**

Area of practice	Replies N (%)
Academic pharmacy	43 (9.2)
Administrative pharmacy	29 (6.2)
Community pharmacy	73 (15.6)
Hospital pharmacy	266 (56.7)
Industrial pharmacy	41 (8.7)
Laboratory & medicine control pharmacy	4 (0.9)
Military & Emergency pharmacy	2 (0.4)
Pharmacy Information	11 (2.3)
<b>N Total (%)</b>	<b>469 (100)</b>

### 3.3.2 Homogeneity of survey responses

The observed disparity in the distribution of the survey replies suggested two cluster groups: a group of countries with number of replies ranging from 64 to 166, and a group with comparatively lower number of replies per country ranging from one to 15. Based on the number of replies, an arbitrary cut-off of 50 replies per country was used to regroup the countries represented in the survey. This was done in order to evaluate homogeneity and ascertain whether the sample could be treated as a group irrespective of the number of replies received per country. To do this, countries with more than 50 replies were defined as the 'high response' countries and included Ghana, Kenya, Nigeria and South Africa. The 'low response' countries included Ethiopia, Egypt, Lesotho, Namibia, Sudan, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe. Table 3.2 shows the number of replies within the country group per area of pharmacy practice.

**Table 3.2: Distribution of replies per area of practice within country group**

Area of practice	Country Response Group (n%)	
	High response countries	Low response countries
Academic pharmacy	37 (8.7)	6 (14)
Administrative pharmacy	25 (5.9)	4 (9.3)
Community pharmacy	63 (14.8)	10 (23.3)
Hospital pharmacy	252 (59.2)	14 (32.6)
Industrial pharmacy	36 (8.5)	5 (11.6)
Laboratory & medicine control pharmacy	2 (0.5)	2 (4.7)
Military & Emergency pharmacy	2 (0.5)	0.0
Pharmacy Information	9 (2.1)	2 (4.7)
<b>N Total Sample (%)</b>	<b>426 (90.8)</b>	<b>43 (9.2)</b>

Homogeneity of the survey sample was evaluated using the Pearson's Chi Square ( $X^2$ ) test. The hypothesis tested was that "the weighting of relevance is associated with the country response group in the survey sample". An association between the weighting of relevance and the country response group in less than (or equal to) 10% of the behaviours (n =100) in the questionnaire was predefined as the threshold indicative of homogeneity. This would mean the relative proportions of the ratings in the relevance categories (that means: the ratings in

the 'not relevant', 'low relevance' and 'relevant' categories) in the two 'country response' groups are similar to that expected of a binomial distribution such that the sample could be assumed to be from the same population. This threshold was chosen based on the findings of a similar research conducted by Bruno (2011) which showed that respondents (n=470) from 64 countries rated 90% of the GbCF v1 behaviours as relevant to practice. The  $X^2$  tests were carried out simultaneously for the 100 behaviours in the GbCF v1 questionnaire with statistical significance predefined as  $p \leq 0.01$ . The outcome of these analyses is presented using frequency tables (Table 3.3 to 3.6).

The analysis showed that the distribution of the ratings in the categories (this means, the 'not relevant', 'low relevance' and 'relevant' categories) was associated with the country response group for 11 behaviours (Table 3.3 to 3.6). This suggests the weighting of relevance for these eleven behaviours was dependent on country response group (that is, the low- or high response country group). These eleven behaviours were distributed across the four competency clusters in no observable pattern: two were in the pharmaceutical and public health cluster (B1 & B4); three in the pharmaceutical care cluster (B6, B12 & B19); five in the organisation and management cluster (B37, B42, B44, B54, B61); and one in the professional & personal cluster (B94) [Table 3.3 to 3.6].

Although an association with country response group was observed for these eleven behaviours— which is above the predefined threshold of  $\leq 10\%$  if the GbCFv1 behaviours— homogeneity of the sample was still assumed for a number of reasons:

- Inspection of the frequency tables indicated that only four of the eleven behaviours showing an association had  $>10\%$  of the ratings in the 'not relevant' category for either the high response or low response country group. These four behaviours were the B19 (related to medicines use), B37 (related to human resource management), B44 (related to procurement) and B61 (related to work place management).
- Also, it is likely that the  $X^2$  test underestimated the p-values since there were a number of empty cells and counts (frequency) of less than five observed in 83 of the behaviours in the questionnaire. This was mainly in the low response country group,

which suggests an absent of data due to small sample in the group rather than a deviation from expected frequency.

Full discussion of this and the other reasons for assuming homogeneity in the survey sample is provided in the discussion section of this chapter (Section 3.6).



**Table 3.3: Analysis of relevance rating of behaviours in relation to country response group (Pharmaceutical Public Health cluster)**

Pharmaceutical Public Health Competencies (n=469)	High Response Countries (n=426)						Low Response Countries (n=43)						$\chi^2$ -value	p	
	Not relevant		Low relevance		Relevant		Not relevant		Low relevance		Relevant				
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)			
<b>Health promotion</b>															
<b>B1.</b> HP   Assess the primary healthcare needs (taking into account the cultural and social setting of the patient)	10	2.3	20	4.7	396	93	1	2.3	7	16.3	35	81.4	9.67	0.01	
<b>B2.</b> HP   Advise on health promotion, disease prevention and control, and healthy lifestyle	2	0.5	19	4.5	405	95.1	0	0	7	16.3	36	83.7	10.58	0.03	
<b>Medicines information and advice</b>															
<b>B3.</b> MIA   Counsel patients on the appropriate use of medicines and devices (including the selection, use, contraindications, storage, and side effects of non-prescription and prescription medicines) taking into account patients preferences	3	0.7	18	4.2	405	95.1	0	0	5	11.6	38	88.4	4.85	0.07	
<b>B4.</b> MIA   Identify sources, retrieve, evaluate, organise, assess and disseminate relevant medicines information according to the needs of patients and clients and provide appropriate information	2	0.5	22	5.2	402	94.3	1	2.3	8	18.6	34	79	1.12	0.01	

**Table 3.4: Analysis of relevance rating of behaviours in relation to country response group (Pharmaceutical Care cluster)**

Pharmaceutical Care Competencies ( n=386)	High Response Countries (n=350)						Low Response Countries (n=36)						χ <sup>2</sup> -value	p	
	Not relevant		Low relevance		Relevant		Not relevant		Low relevance		Relevant				
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)			
<b>Assessment of medicines</b>															
<b>B5.</b> AM   Appropriately select medicines (e.g. according to the patient, hospital, government policy, etc)	15	4.3	36	10.3	299	85.4	3	8.3	4	11.1	29	80.5	1.26	0.53	
<b>B6.</b> AM   Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions	40	11.4	68	19.4	242	69.2	3	8.3	15	41.7	18	50	9.56	0.01	
<b>Compounding medicines</b>															
<b>B7.</b> CM   Prepare pharmaceutical medicines (e.g. extemporaneous, cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment etc.)	22	6.3	54	15.4	274	78.3	3	8.3	7	19.4	26	72.2	0.7	0.71	
<b>B8.</b> CM   Compound under the good manufacturing practice for pharmaceutical (GMP) medicines	29	8.3	57	16.3	264	75.4	6	16.7	4	11.1	26	72.3	3.13	0.21	
<b>Dispensing</b>															
<b>B9.</b> D   Accurately dispense medicines for prescribed and/or minor ailments and monitor the dispense (re-checking the medicines)	16	4.6	35	10	299	85.4	3	8.3	8	22.2	25	69.4	6.31	0.04	
<b>B10.</b> D   Accurately report defective or substandard medicines to the appropriate authorities	22	6.3	45	12.9	283	80.8	4	11.1	8	22.2	24	66.7	4.04	0.13	
<b>B11.</b> D   Appropriately validate prescriptions, ensuring that prescriptions are correctly interpreted and legal	16	4.6	35	10	299	85.5	0	0	6	16.7	30	83.4	3.03	0.22	
<b>B12.</b> D   Dispense devices (e.g. Inhaler or a blood glucose meter)	11	3.1	18	5.1	321	91.7	0	0	9	25	27	75	20.54	<0.001	
<b>B13.</b> D   Document and act upon dispensing errors	42	12	37	10	271	77.4	8	22.2	7	19.4	21	58.3	6.46	0.04	
<b>B14.</b> D   Implement and maintain a dispensing error report system and a 'near misses' report system	38	10.9	42	12	270	77.1	5	13.9	4	11.1	27	75	0.31	0.86	
<b>B15.</b> D   Label the medicines (with the required and appropriate information)	18	5.1	11	3.1	321	91.7	2	5.6	3	8.3	31	86.1	2.55	0.28	
<b>B16.</b> D   Learn from and act upon previous 'near misses' and 'dispensing errors	17	4.9	22	6.3	311	88.9	2	5.6	5	13.9	29	80.5	2.99	0.23	
<b>Medicines</b>															
<b>B17.</b> M   Advise patients on proper storage conditions of the medicines and ensure that medicines are stored appropriately (e.g. humidity, temperature, expiry date, etc.)	16	4.6	13	3.7	321	91.7	3	8.3	4	11.1	29	80.5	5.44	0.07	
<b>B18.</b> M   Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites, etc.)	29	8.3	38	10.9	283	80.8	4	11.1	4	11.1	28	77.8	0.35	0.84	
<b>B19.</b> M   Ensure appropriate medicines, route, time, dose, documentation, action, form and response for individual patients	22	6.3	21	6	307	87.7	5	13.9	7	19.4	24	66.7	12.52	0.002	
<b>B20.</b> M   Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)	32	9.1	41	11.7	277	79.1	7	19.4	6	16.7	23	63.9	5.06	0.08	
<b>Monitor medicines therapy</b>															
<b>B21.</b> MMT   Apply guidelines, medicines formulary system, protocols and treatment pathways	18	5.1	8	2.3	324	92.5	1	2.8	3	8.3	32	88.8	4.61	0.1	
<b>B22.</b> MMT   Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures)	19	5.4	20	5.7	311	88.9	3	8.3	6	16.7	27	75	7.01	0.03	
<b>B23.</b> MMT   Identify, prioritise and resolve medicines management problems (including errors)	10	2.9	17	4.9	323	92.3	2	5.6	2	5.6	32	88.8	0.84	0.66	
<b>Patient consultation &amp; diagnosis</b>															
<b>B24.</b> PCD   Apply first aid and act upon arranging follow-up care	16	4.6	25	7.1	309	88	2	5.6	4	11.1	3	83.4	0.84	0.66	
<b>B25.</b> PCD   Appropriately refer	11	3.1	14	4	325	92.8	3	8.3	4	11.1	29	80.5	6.5	0.04	
<b>B26.</b> PCD     Assess and diagnose based on objective and subjective measures	9	2.6	17	4.9	324	92.6	3	8.3	4	11.1	29	80.6	6.4	0.05	
<b>B27.</b> PCD   Discuss and agree with the patients the appropriate use of medicines, taking into account patients preferences	12	3.4	25	7.1	313	89.4	2	5.6	5	13.9	29	80.5	2.61	0.27	
<b>B28.</b> PCD   Document any intervention (e.g. document allergies, medicines and food, in patient medicines history)	16	4.6	38	10.9	296	84.5	5	13.9	5	13.9	26	72.2	6.08	0.05	
<b>B29.</b> PCD   Obtain, reconcile, review, maintain and update relevant patient medication and diseases history	14	4	23	6.6	313	89.4	4	11.1	5	13.9	27	75	6.72	0.04	

**Table 3.5: Analysis of relevance rating of behaviours in relation to county response group (Organisation & Management cluster)**

Organisation & Management Competencies (n=328)	High Response Countries (n=295)						Low Response Countries (n=33)						χ <sup>2</sup> -value	p
	Not relevant		Low relevance		Relevant		Not relevant		Low relevance		Relevant			
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)		
<b>Budget &amp; reimbursement</b>														
B30. BR   Acknowledge the organisational structure	14	4.7	37	12.5	244	82.7	2	6.1	8	24.2	23	69.7	3.68	0.16
B31. BR   Effectively set and apply budgets	17	5.8	45	15.3	233	79	3	9.1	8	24.2	22	66.6	2.6	0.27
B32. BR   Ensure appropriate claim for the reimbursement	31	10.5	49	16.6	215	72.9	9	27.3	5	15.2	19	57.6	7.85	0.02
B33. BR   Ensure financial transparency	16	5.4	38	12.9	241	81.7	5	15.2	7	21.2	21	63.6	7.1	0.03
B34. BR   Ensure proper reference sources for service reimbursement	28	9.5	51	17.3	216	73.3	6	18.2	5	15.2	22	66.7	2.42	0.03
<b>Human resource management</b>														
B35. HRM   Demonstrate organisational and management skills (e.g. Know, understand and lead on medicines management; risk management; self management; time management; people management; project management; policy management.)	7	2.4	17	5.8	271	91.9	1	3	6	18.2	26	78.7	7.14	0.03
B36. HRM   Identify and manage human resources and staffing issues	11	3.7	32	10.8	252	85.5	2	6.1	5	15.2	26	78.8	1.05	0.59
B37. HRM   Participate, collaborate, advice in therapeutic decision-making and use appropriate referral in a multi-disciplinary team	11	3.7	23	7.8	261	88.5	4	12.1	6	18.2	23	69.7	9.4	0.01
B38. HRM   Recognise and manage the potential of each member of the staff and utilise systems for performance management (e.g. carry out staff appraisals)	9	3.1	28	9.5	258	87.5	3	9.1	5	15.2	25	75.8	4.38	0.11
B39. HRM   Recognise the value of the pharmacy team and of a multidisciplinary team	6	2	20	6.8	269	91.2	1	3	5	15.2	27	81.8	3.16	0.21
B40. HRM   Support and facilitate staff training and professional development	6	2	19	6.4	270	91.5	3	9.1	4	12.1	26	78.8	7.29	0.21
<b>Improvement of service</b>														
B41. IS   Identify and implement new services (according to local needs)	6	2	27	9.2	262	88.8	1	3	8	24.2	24	72.8	7.35	0.03
B42. IS   Resolve, follow up and prevent medicines related problems	10	3.4	23	7.8	262	88.8	1	3	9	27.3	23	69.7	12.8	0.001
<b>Procurement</b>														
B43. P   Access reliable information and ensure the most cost-effective medicines in the right quantities with the appropriate quality	9	3.1	17	5.8	269	91.2	3	9.1	3	9.1	27	81.8	3.79	0.15
B44. P   Develop and implement contingency plan for shortages	11	3.7	27	9.2	257	87.1	5	15.2	2	6.1	26	78.8	8.5	0.01
B45. P   Efficiently link procurement to formulary, to push/pull system (supply chain management) and payment mechanisms	13	4.4	39	13.2	243	82.4	5	15.2	5	15.2	23	69.7	6.91	0.03
B46. P   Ensure there is no conflict of interest	14	4.7	38	12.9	243	82.3	5	15.2	5	15.2	23	69.7	6.25	0.04
B47. P   Select reliable supplies of high-quality products (including appropriate selection process, cost effectiveness, timely delivery)	13	4.4	27	9.2	255	86.5	3	9.1	5	15.2	25	75.8	2.83	0.24
B48. P   Supervise procurement activities	18	6.1	29	9.8	248	84	5	15.2	5	15.2	23	69.7	5.02	0.08
B49. P   Understand the tendering methods and evaluation of tender bids	22	7.5	40	13.6	233	79	3	9.1	10	30.3	20	60.6	6.86	0.03
<b>Supply chain and management</b>														
B50. SCM   Demonstrate knowledge in store medicines to minimise errors and maximise accuracy	12	4.1	15	5.1	268	90.9	3	9.1	5	15.2	25	75.7	7.33	0.03
B51. SCM   Ensure accurately verification of rolling stocks	11	3.7	27	9.2	257	87.2	5	15.2	3	9.1	25	75.8	8.38	0.02
B52. SCM   Ensure effective stock management and running of service with the dispensary	13	4.4	14	4.7	268	90.8	5	15.2	3	9.1	25	75.8	8.08	0.02
B53. SCM   Ensure logistics of delivery and storage	12	4.1	21	7.1	262	88.8	4	12.1	2	6.1	27	81.8	4.16	0.13
B54. SCM   Implement a system for documentation and record keeping	11	3.7	13	4.4	271	91.9	3	9.1	8	24.2	22	66.6	22.35	0.001
B55. SCM   Take responsibility for quantification of forecasting	17	5.8	20	6.8	258	87.4	6	18.2	2	6.1	25	75.8	7.02	0.03
<b>Work place management</b>														
B56. WPM   Address and manage day to day management issues	8	2.7	16	5.4	271	91.8	0	0	4	12.1	29	87.9	3.13	0.21
B57. WPM   Demonstrate the ability to take accurate and timely decisions and make appropriate judgments	7	2.4	13	4.4	275	93.2	1	3	2	6.1	30	90.9	2.47	0.88
B58. WPM   Ensure the production schedules are appropriately plan and manage	31	10.5	44	14.9	220	74.6	4	12.1	8	24.2	21	63.7	2.18	0.34
B59. WPM   Ensure the work time is appropriately plan and manage	8	2.7	18	6.1	269	91.2	2	6.1	5	15.2	26	78.8	5.07	0.08
B60. WPM   Improve and manage the provision of pharmaceutical services	6	2	16	5.4	273	92.5	2	6.1	4	12.1	27	81.8	4.53	0.04
B61. WPM   Recognise and manage pharmacy resources (e.g. financial, infrastructure)	9	3.1	26	8.8	260	88.2	5	15.2	3	9.1	25	75.7	10.71	0.01

**Table 3.6: Analysis of relevance rating of behaviours in relation to county response group (Professional & Personal cluster)**

Professional & Personal Competencies (n = 305)	High Response Countries (273)						Low Response Countries (32)						χ <sup>2</sup> -value	p
	Not relevant		Low relevance		Relevant		Not relevant		Low relevance		Relevant			
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)		
<b>Communication skills</b>														
B62. CS   Communicate clearly, precisely and appropriately while being a mentor or tutor	2	0.7	6	2.2	265	97.1	2	6.3	0	0	30	93.8	7.38	0.07
B63. CS   Communicate effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding	4	1.5	7	2.6	262	96	0	0	2	6.3	30	93.7	1.76	0.41
B64. CS   Demonstrate cultural awareness and sensitivity	6	2.2	14	5.1	253	92.6	0	0	3	9.4	29	90.7	1.64	0.44
B65. CS   Tailor communications to patient needs	5	1.8	10	3.7	258	94.5	0	0	5	15.6	27	84.4	9.23	0.03
B66. CS   Use appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)	3	1.1	7	2.6	263	96.3	0	0	3	9.4	29	90.7	4.5	0.1
<b>Continuing professional education</b>														
B67. CPD   Document CPD activities	7	2.6	33	12.1	233	85.3	3	9.4	3	9.4	26	81.3	4.29	0.12
B68. CPD   Engage with students/interns/residents	10	3.7	24	8.8	239	87.5	2	6.3	4	12.5	26	81.3	1.05	0.59
B69. CPD   Evaluate currency of knowledge and skills	5	1.8	23	8.4	245	89.8	3	9.4	2	6.3	27	84.4	6.47	0.04
B70. CPD   Evaluate learning	5	1.8	23	8.4	245	89.7	3	9.4	2	6.3	27	84.4	6.47	0.04
B71. CPD   Identify if expertise needed outside the scope of knowledge	6	2.2	25	9.2	242	88.7	3	9.4	6	18.8	23	71.9	8.52	0.02
B72. CPD   Identify learning needs	4	1.5	25	9.2	244	89.4	3	9.4	3	9.4	26	81.3	8.02	0.02
B73. CPD   Recognise own limitations and act upon them	4	1.5	16	5.9	253	92.7	1	3.1	4	12.5	27	84.4	2.62	0.27
B74. CPD   Reflect on performance	3	1.1	11	4	259	94.8	1	3.1	3	9.4	28	87.5	2.85	0.24
<b>Legal &amp; regulatory practice</b>														
B75. LRP   Apply and understands Regulatory Affairs and the key aspects of pharmaceutical registration and legislation	7	2.6	22	8.1	244	89.4	0	0	1	3.1	31	96.9	1.92	0.38
B76. LRP   Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretation	16	5.9	50	18.3	207	75.9	0	0	4	12.5	28	87.5	2.92	0.23
B77. LRP   Be aware of and identify the new medicines coming to the market	4	1.5	23	8.4	246	90.1	0	0	2	6.3	30	93.7	0.68	0.71
B78. LRP   Comply with legislation for drugs with the potential for abuse	4	1.5	11	4	258	94.5	1	3.1	0	0	31	96.9	1.79	0.41
B79. LRP   Demonstrate knowledge in Marketing and Sale	22	8.1	66	24.2	185	67.8	2	6.3	9	28.1	21	65.7	0.32	0.31
B80. LRP   Engage with health and medicines policies	3	1.1	30	11	240	87.9	0	0	1	3.1	31	96.9	2.35	0.32
B81. LRP   Understand the steps needed to bring a medicinal product to the market including the safety, quality, efficacy and pharmacoeconomic assessments of the product	17	6.2	39	14.3	217	79.5	1	3.1	2	6.3	29	90.7	2.28	0.37
<b>Professional and ethical practice</b>														
B82. PEP   Demonstrate awareness of local/national codes of ethics	5	1.8	12	4.4	256	93.8	0	0	2	6.3	30	93.8	0.8	0.67
B83. PEP   Ensure confidentiality (with the patient and other healthcare professionals)	4	1.5	10	3.7	259	94.9	0	0	0	0	32	100	1.72	0.42
B84. PEP   Obtain patient consent (it can be implicit in occasions)	9	3.3	16	5.9	248	90.8	1	3.1	5	15.6	26	81.3	4.26	0.12
B85. PEP   Recognise own limitations	5	1.8	11	4	257	94.1	0	0	3	9.4	29	90.7	2.11	0.3
B86. PEP   Take responsibility for own action and for patient care	5	1.8	9	3.3	259	94.9	0	0	2	6.3	30	93.7	1.28	0.53
<b>Quality assurance &amp; research in the workplace</b>														
B87. QARWP   Apply research findings and understand the benefit risk (e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management)	31	11.4	44	16.1	198	72.5	3	9.4	4	12.5	25	78.2	0.46	0.79
B88. QARWP   Audit quality of service (ensure that they meet local and national standards and specifications)	15	5.5	15	5.5	243	89	2	6.3	2	6.3	28	87.5	1.22	0.54
B89. QARWP   Developed and implement Standing Operating Procedures (SOP's)	15	5.5	15	5.5	243	89	2	6.3	2	6.3	28	87.5	0.07	0.97
B90. QARWP   Ensure appropriate quality control tests are performed and managed appropriately	36	13.2	52	19	185	67.8	3	9.4	2	6.3	27	84.4	4.11	0.13
B91. QARWP   Ensures medicines are not counterfeit and quality standards	16	5.9	19	7	238	87.2	0	0	5	15.6	27	84.4	4.64	0.1
B92. QARWP   Identify and evaluate evidence-base to improve the use of medicines and services	16	5.9	28	10.3	229	83.8	0	0	4	12.5	28	87.5	2.06	0.36
B93. QARWP   Identify, investigate, conduct, supervise and support research at the workplace (enquiry-driven practice)	25	9.2	45	16.5	203	74.3	4	12.5	3	9.4	25	78.2	1.31	0.05
B94. QARWP   Implement, conduct and maintain a report system of pharmacovigilance (e.g. report Adverse Drug Reactions)	16	5.9	11	4	246	90.1	2	6.3	6	18.8	24	75.1	11.88	0.003
B95. QARWP   Initiate and implement audit and research activities	30	11	46	16.8	197	72.1	3	9.4	6	18.8	23	71.9	0.13	0.14
<b>Self-management</b>														
B96. SM   Apply assertiveness skills (inspire confidence)	4	1.5	8	2.9	261	95.6	1	3.1	1	3.1	30	93.8	0.5	0.78
B97. SM   Demonstrate leadership and practice management skills, initiative and efficiency	4	1.5	9	3.3	260	95.3	0	0	3	9.4	29	90.7	3.22	0.2
B98. SM   Document risk management (e.g. critical incidents)	11	4	22	8.1	240	87.9	3	9.4	6	18.8	23	71.9	6.2	0.05
B99. SM   Ensure punctuality	1	0.4	8	2.9	264	96.7	0	0	2	6.3	30	93.7	1.12	0.56
B100. SM   Prioritise work and implement innovative ideas	4	1.5	10	3.7	259	94.8	0	0	2	6.3	30	93.8	0.96	0.62

### 3.3.3 Overall relevance rating

The number of replies received varied for the four competency clusters as follows:

- Pharmaceutical Public Health cluster – **469** replies
- Pharmaceutical Care cluster – **386** replies
- Organisation & Management cluster – **328** replies
- Professional & Personal cluster – **305** replies

At the end of the study, 305 of the 469 total number of survey respondents provided responses to all the 105 questions in the GbCF v1 questionnaire. Evidence suggests the disparity in number of replies received per competency cluster may be due to the length of the questionnaire (Kalantar and Talley, 1999). Findings from a meta-analysis of randomised controlled trials shows that the odds of a response decreases by more than half as the number of pages of a survey questionnaire increases [OR: 0.39, 95% CI 0.34 to 0.45] (Edwards et al., 2004). Nonetheless, research also demonstrates that the variation in response rates per page of a questionnaire does not affect the quality of the overall responses received (Iglesias and Torgerson, 2000). Consequently, the responses provided by the entire survey sample was analysed for each of the 100 GbCF v1 behaviours.

For this analysis, behaviours that had  $\leq 10\%$  of the total ratings in the 'not relevant' category were defined as behaviours showing agreement on relevant to practice. These 'agreed' behaviours were subsequently defined as 'Group 1' behaviours. Behaviours with  $>10\%$  of the overall ratings in the 'not relevant' category were those that showed disagreement. These 'disagreed' behaviours were classified as 'Group 2'. This means, Group 2 included behaviours with  $>10\%$  of the total ratings in 'not relevant' category. The threshold of agreement was defined based on the findings of the study by Bruno (2011) and is also in line with published literature in healthcare research that have defined consensus as 90% agreement (Herdman et al., 2002; Schweigert, 2011, p. 176). The output of the overall relevance analysis is presented using frequency tables (Tables 3.7 to 3.9).

**Table 3.7: Relevance rating of behaviours within the Pharmaceutical Public Health cluster**

Pharmaceutical Public Health Competencies (n=469)	Not relevant		Low Relevance		Relevant		Group
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	
<b>Health promotion</b>							
<b>B1.</b> HP   Assess the primary healthcare needs (taking into account the cultural and social setting of the patient)	11	2.30	27	5.8	431	91.9	1
<b>B2.</b> HP   Advise on health promotion, disease prevention and control, and healthy lifestyle	2	0.4	26	5.5	441	94	1
<b>Medicines information and advice</b>							
<b>B3.</b> MIA   Counsel patients on the appropriate use of medicines and devices (including the selection, use, contraindications, storage, and side effects of non-prescription and prescription medicines) taking into account patients preferences	3	0.60	23	4.90	443	94.4	1
<b>B4.</b> MIA   Identify sources, retrieve, evaluate, organise, assess and disseminate relevant medicines information according to the needs of patients and clients and provide appropriate information	3	0.60	30	6.40	436	92.9	1

Based on the replies, there was consensus that all behaviours in the pharmaceutical public health cluster were relevant to practice.

**Table 3.8: Relevance rating of behaviours in the Pharmaceutical Care cluster**

Pharmaceutical Care Competencies ( n=386)	Not Relevant		Low Relevance		Relevant		Group
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	
<b>Assessment of medicines</b>							
B5. AM   Appropriately select medicines (e.g. according to the patient, hospital, government policy, etc)	18	4.7	40	10.4	328	85	1
B6. AM   Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions	43	11.1	83	21.5	260	67.4	2
<b>Compounding medicines</b>							
B7. CM   Prepare pharmaceutical medicines (e.g. extemporaneous, cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment etc.)	25	6.5	61	15.8	300	77.7	1
B8. CM   Compound under the good manufacturing practice for pharmaceutical (GMP) medicines	35	9.1	61	15.8	290	75.1	1
<b>Dispensing</b>							
B9. D   Accurately dispense medicines for prescribed and/or minor ailments and monitor the dispense (re-checking the medicines)	19	4.9	43	11.2	324	83.9	1
B10. D   Accurately report defective or substandard medicines to the appropriate authorities	26	6.7	53	13.7	307	79.5	1
B11. D   Appropriately validate prescriptions, ensuring that prescriptions are correctly interpreted and legal	16	4.1	41	10.6	329	85.2	1
B12. D   Dispense devices (e.g. Inhaler or a blood glucose meter)	11	2.8	27	7	348	90.2	1
B13. D   Document and act upon dispensing errors	50	13	44	11.4	292	75.6	2
B14. D   Implement and maintain a dispensing error report system and a 'near misses' report system	43	11.1	46	11.9	297	76.9	2
B15. D   Label the medicines (with the required and appropriate information)	14	5.2	20	3.6	352	91.2	1
B16. D   Learn from and act upon previous 'near misses' and 'dispensing errors'	19	4.9	27	7	340	88.1	1
<b>Medicines</b>							
B17. M   Advise patients on proper storage conditions of the medicines and ensure that medicines are stored appropriately (e.g. humidity, temperature, expiry date, etc.)	17	4.9	19	4.4	350	90.7	1
B18. M   Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites, etc.)	33	8.5	42	10.9	311	80.6	1
B19. M   Ensure appropriate medicines, route, time, dose, documentation, action, form and response for individual patients	27	7	28	7.3	331	85.8	1
B20. M   Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)	39	10.1	47	12.2	300	77.7	2
<b>Monitor medicines therapy</b>							
B21. MMT   Apply guidelines, medicines formulary system, protocols and treatment pathways	11	4.9	19	2.9	356	92.2	1
B22. MMT   Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures)	22	5.7	26	6.7	338	87.6	1
B23. MMT   Identify, prioritise and resolve medicines management problems (including errors)	12	3.1	19	4.9	355	92	1
<b>Patient consultation and diagnosis</b>							
B24. PCD   Apply first aid and act upon arranging follow-up care	18	4.7	29	7.5	339	87.8	1
B25. PCD   Appropriately refer	14	3.6	18	4.7	354	91.7	1
B26. PCD   I Assess and diagnose based on objective and subjective measures	12	3.1	21	5.4	353	91.5	1
B27. PCD   Discuss and agree with the patients the appropriate use of medicines, taking into account patients preferences	14	3.6	30	7.8	342	88.6	1
B28. PCD   Document any intervention (e.g. document allergies, medicines and food, in patient medicines history)	21	5.4	43	11.1	322	83.4	1
B29. PCD   Obtain, reconcile, review, maintain and update relevant patient medication and diseases history	18	4.7	28	7.3	340	88.1	1

The respondents rated 21 (84%) of the behaviours in the pharmaceutical care cluster as relevant to practice. There was disagreement in four (16%) of the behaviours (shaded pink). Further analysis was conducted to evaluate this disagreement and identify areas of practice that rated these behaviours as not relevant (Table 3.11).

**Table 3.9: Relevance rating of behaviours in the Organisation & Management cluster**

Organisation & Management Competencies (n=328)	Not relevant		Low Relevance		Relevant		Group
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	
<b>Budget &amp; reimbursement</b>							
B30. BR   Acknowledge the organisational structure	16	4.9	45	13.7	267	81.4	1
B31. BR   Effectively set and apply budgets	20	6.1	53	16.2	255	77.7	1
B32. BR   Ensure appropriate claim for the reimbursement	40	12.2	54	16.5	234	71.4	2
B33. BR   Ensure financial transparency	21	6.4	45	13.7	262	79.9	1
B34. BR   Ensure proper reference sources for service reimbursement	34	10.4	56	17.1	238	72.5	2
<b>Human resources Management</b>							
B35. HRM   Demonstrate organisational and management skills (e.g. Know, understand and lead on medicines management; risk management; self management; time management; people management; project management; policy management.)	8	2.4	23	7	297	90.6	1
B36. HRM   Identity and manage human resources and staffing issues	13	4	37	11.3	278	84.8	1
B37. HRM   Participate, collaborate, advice in therapeutic decision-making and use appropriate referral in a multi-disciplinary team	15	4.6	29	8.8	284	86.6	1
B38. HRM   Recognise and manage the potential of each member of the staff and utilise systems for performance management (e.g. carry out staff appraisals)	12	3.7	33	10.1	283	86.3	1
B39. HRM   Recognise the value of the pharmacy team and of a multidisciplinary team	7	2.1	25	7.6	296	90.2	1
B40. HRM   Support and facilitate staff training and professional development	9	2.7	23	7	296	90.2	1
<b>Improvement of service</b>							
B41. IS   Identify and implement new services (according to local needs)	7	2.1	35	10.7	286	87.2	1
B42. IS   Resolve, follow up and prevent medicines related problems	11	3.4	32	9.8	285	86.9	1
<b>Procurement</b>							
B43. P   Access reliable information and ensure the most cost-effective medicines in the right quantities with the appropriate quality	12	3.7	20	6.1	296	90.2	1
B44. P   Develop and implement contingency plan for shortages	16	4.9	29	8.8	283	86.3	1
B45. P   Efficiently link procurement to formulary, to push/pull system (supply chain management) and payment mechanisms	18	5.5	44	13.4	266	81.1	1
B46. P   Ensure there is no conflict of interest	19	5.8	43	13.1	266	81.1	1
B47. P   Select reliable supplies of high-quality products (including appropriate selection process, cost effectiveness, timely delivery)	16	4.9	32	9.8	280	85.4	1
B48. P   Supervise procurement activities	23	7.0	34	10.4	271	82.6	1
B49. P   Understand the tendering methods and evaluation of tender bids	25	7.6	50	15.2	253	77.1	1
<b>Supply chain and management</b>							
B50. SCM   Demonstrate knowledge in store medicines to minimise errors and maximise accuracy	15	4.6	20	6.1	293	89.3	1
B51. SCM   Ensure accurately verification of rolling stocks	16	4.9	30	9.1	282	86	1
B52. SCM   Ensure effective stock management and running of service with the dispensary	17	5.5	18	5.2	293	89.3	1
B53. SCM   Ensure logistics of delivery and storage	16	4.9	23	7	289	88.1	1
B54. SCM   Implement a system for documentation and record keeping	14	4.3	21	6.4	293	89.3	1
B55. SCM   Take responsibility for quantification of forecasting	22	7.0	23	6.7	283	86.3	1
<b>Work place management</b>							
B56. WPM   Address and manage day to day management issues	8	2.4	20	6.1	300	91.5	1
B57. WPM   Demonstrate the ability to take accurate and timely decisions and make appropriate judgments	8	2.4	15	4.6	305	93	1
B58. WPM   Ensure the production schedules are appropriately plan and manage	35	10.7	52	15.9	241	73.5	2
B59. WPM   Ensure the work time is appropriately plan and manage	10	3	23	7	295	89.9	1
B60. WPM   Improve and manage the provision of pharmaceutical services	8	2.4	20	6.1	300	91.5	1
B61. WPM   Recognise and manage pharmacy resources (e.g. financial, infrastructure)	14	4.3	29	8.8	285	86.9	1

Respondents rated 29 (90%) of the behaviours in the organisation & management as relevant to practice. There was disagreement in three (9.4%) behaviours (shaded pink) and these were further analysed to evaluate areas of practice that rated them not relevant (Table 3.11).



**Table 3.10: Relevance rating of behaviours in the Professional & Personal cluster**

Professional & Personal Competencies (n=305)	Not relevant		Low Relevance		Relevant		Group
	Count	Row (N%)	Count	Row (N%)	Count	Row (N%)	
<b>Communication skills</b>							
B62. CS   Communicate clearly, precisely and appropriately while being a mentor or tutor	4	1.3	6	2	295	96.7	1
B63. CS   Communicate effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding	4	1.3	9	3	292	95.7	1
B64. CS   Demonstrate cultural awareness and sensitivity	6	2.0	17	5.6	282	92.5	1
B65. CS   Tailor communications to patient needs	5	1.6	15	4.9	285	93.4	1
B66. CS   Use appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)	3	<0.1	10	3.3	292	95.7	1
<b>Continuing Professional Development (CPD)</b>							
B67. CPD   Document CPD activities	10	3.3	36	11.8	259	84.9	1
B68. CPD   Engage with students/interns/residents	12	3.9	28	9.2	265	86.9	1
B69. CPD   Evaluate currency of knowledge and skills	8	2.6	25	8.2	272	89.2	1
B70. CPD   Evaluate learning	8	2.6	25	8.2	272	89.2	1
B71. CPD   Identify if expertise needed outside the scope of knowledge	9	3.0	31	10.2	265	86.9	1
B72. CPD   Identify learning needs	7	2.3	28	9.2	270	88.5	1
B73. CPD   Recognise own limitations and act upon them	5	1.6	20	6.6	280	91.8	1
B74. CPD   Reflect on performance	4	1.3	14	4.6	287	94.1	1
<b>Legal and regulatory practice</b>							
B75. LRP   Apply and understands Regulatory Affairs and the key aspects of pharmaceutical registration and legislation	7	2.3	23	7.5	275	90.2	1
B76. LRP   Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretation	16	5.2	54	17.7	235	77.1	1
B77. LRP   Be aware of and identify the new medicines coming to the market	4	1.3	25	8.2	276	90.5	1
B78. LRP   Comply with legislation for drugs with the potential for abuse	5	1.6	11	3.6	289	94.8	1
B79. LRP   Demonstrate knowledge in Marketing and Sale	24	7.9	75	24.6	206	67.5	1
B80. LRP   Engage with health and medicines policies	3	<0.1	31	10.2	271	88.9	1
B81. LRP   Understand the steps needed to bring a medicinal product to the market including the safety, quality, efficacy and pharmacoeconomic assessments of the product	18	5.9	41	13.4	246	80.7	1
<b>Professional and ethical practice</b>							
B82. PEP   Demonstrate awareness of local/national codes of ethics	5	1.6	14	4.6	286	93.8	1
B83. PEP   Ensure confidentiality (with the patient and other healthcare professionals)	4	1.3	10	3.3	291	95.4	1
B84. PEP   Obtain patient consent (it can be implicit in occasions)	10	3.3	21	6.9	274	89.8	1
B85. PEP   Recognise own limitations	5	1.6	14	4.6	286	93.8	1
B86. PEP   Take responsibility for own action and for patient care	5	1.6	11	3.6	289	94.8	1
<b>Quality assurance &amp; research in the work place</b>							
B87. QARWP   Apply research findings and understand the benefit risk (e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management)	34	11.1	48	15.7	223	73.1	2
B88. QARWP   Audit quality of service (ensure that they meet local and national standards and specifications)	26	8.5	34	11.1	245	80.3	1
B89. QARWP   Developed and implement Standing Operating Procedures (SOP's)	17	5.6	17	5.6	271	88.9	1
B90. QARWP   Ensure appropriate quality control tests are performed and managed appropriately	39	12.8	54	17.7	212	69.5	2
B91. QARWP   Ensures medicines are not counterfeit and quality standards	16	5.2	24	7.9	265	86.9	1
B92. QARWP   Identify and evaluate evidence-base to improve the use of medicines and services	16	5.2	32	10.5	257	84.3	1
B93. QARWP   Identify, investigate, conduct, supervise and support research at the workplace (enquiry-driven practice)	29	9.5	48	15.7	228	74.8	1
B94. QARWP   Implement, conduct and maintain a report system of pharmacovigilance (e.g. report Adverse Drug Reactions)	17	5.9	18	5.6	270	88.5	1
B95. QARWP   Initiate and implement audit and research activities	33	10.8	52	17.5	220	72.1	2
<b>Self-management</b>							
B96. SM   Apply assertiveness skills (inspire confidence)	5	1.6	9	3	291	95.4	1
B97. SM   Demonstrate leadership and practice management skills, initiative and efficiency	4	1.3	12	3.9	289	94.8	1
B98. SM   Document risk management (e.g. critical incidents)	14	4.6	28	9.2	263	86.2	1
B99. SM   Ensure punctuality	1	<0.1	10	3.3	294	96.4	1
B100. SM   Prioritise work and implement innovative ideas	4	1.3	12	3.9	289	94.8	1

Respondents rated 36 (92%) of the behaviours in the professional and personal cluster, as relevant to practice. There was disagreement in three (7.7%) of the behaviours and further

analysis was conducted to evaluate areas of practice that rated these as not relevant (Table 3.11).

### ***3.3.3.1 Summary of overall relevance rating***

There was consensus on relevance to practice for 90 behaviours in the framework. Ten behaviours had more than 10% of the total ratings in the 'not relevant' category and therefore showed disagreement.

The 'pharmaceutical public health' was the only cluster with agreement on all its behaviours. The ten behaviours that showed disagreement were in six competencies distributed across the other three clusters in the GbCF v1 questionnaire:

- 'Assessment of medicine' (AM), 'dispensing' (D) and 'medicines' (M) competencies in the Pharmaceutical Care cluster;
- 'Budget & reimbursement' (BR) and 'work place management' (WPM) competencies in the Organisation and Management cluster; and
- 'Quality assurance and research in the work place' (QARWP) competency in the Professional & Personal cluster.

The AM, M and WPM competencies each showed disagreement for one behaviour (B6, B20, B58, respectively). The QARWP competency showed disagreement in three behaviours (B87, B90, B95) while the D and BR competencies each showed disagreement in two behaviours [(B13 & B14) and (B32 & B34) respectively].

The ten behaviours that had more than 10% of the total ratings in the 'not relevant' category were further analysed to evaluate the relationship between the ratings and respondents' area of practice. This analysis was conducted within the four clusters in the framework and the outcome is presented in Table 3.11.

### 3.3.4 Observed disagreement

Further analysis of the ten 'disagreed' behaviours showed that the observed disagreement was associated with area of pharmacy practice for six of these behaviours. The association was in three behaviours in the 'pharmaceutical care' [B6, B13 and B20 ( $p < 0.01$ )], one in 'organisation & management' [B32 ( $p < 0.05$ )]; and two in the 'professional & personal' [B87 and B90 ( $p < 0.05$ )] clusters, respectively (Table 3.11).

Respondents in hospital practice were least likely to rate these ten behaviours as 'not relevant'. On the other hand, respondents in academic and industrial pharmacy were more likely to show a lack of consensus [that means % 'not relevant' > 10% (italicised on Table 3.11)] for the behaviours in the 'pharmaceutical care' and 'organisation & management' clusters; a result that is consistent with the scope of practice in these areas (Table 3.11).

The lack of consensus [% 'not relevant' > 10%] in the B13 & B14 (related to dispensing), and B20 (related to medicine use) behaviours observed within the community practice area was inconsistent with practice (italicised on Table 3.11). Nonetheless, evidence suggests this may be related to the peculiarities of community pharmacy practice in some developing countries. Published research show that dispensing activities are mostly carried out by pharmacy support staff and sales assistants in developing countries including Nigeria, Pakistan, Turkey and India (Adje and Oli, 2013; Basak and Sathyanarayana, 2009; Erdogan et al., 2012; Toklu et al., 2010). This may explain the 'not relevant' rating of these dispensing behaviours. Further discussion of this is provided in the discussion section of this chapter (3.6).

**Table 3.11 Analysis of the 'not relevant' ratings in relation to area of practice per competency per cluster**

Cluster	Competencies	Behaviours	Area of practice ( N%)						χ <sup>2</sup> -value	p-value
			Academic	Admin.	Comm.	Hosp.	Indus.	Others*		
Pharmaceutical care	Assessment of medicines	[B6] AM   Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions (n=43)	20	9.5	0	11.6	21.9	7.1	23.5	0.01
	Dispensing	[B13] D   Document and act upon dispensing errors (n=50)	14.3	19	20	7.6	21.9	35.7	36.9	<0.001
		[B14] D   Implement and maintain a dispensing error report system and a 'near misses' report system (n=43)	17.1	14.3	20.3	7.1	12.5	14.3	15.9	0.1
	Medicines	[B20] M   Package medicines to optimise safety [ensuring appropriate re-packaging and labelling of the medicines] (n=39)	20	9.5	16.9	4.4	25	14.3	31.9	<0.001
Organisation and management	Budget and reimbursement	[B32] BR   Ensure appropriate claim for the reimbursement (n=40)	24	5	10.9	8.8	24	27.3	20.1	0.03
		[B34] BR   Ensure proper reference sources for service reimbursement (n=34)	18.2	5	10.9	7.8	16	27.3	16.8	0.08
	Workplace management	[B58] WPM   Ensure the production schedules are appropriately plan and manage (n=35)	15.2	5	19.6	6.7	20	18.2	17.4	0.08
Professional and personal	Quality assurance and research in the workplace	[B87] QARWP   Apply research findings and understand the benefit risk [e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management] (n=34)	12.5	5	20.9	10.2	9.1	0	20.4	0.03
		[B90] QARWP   Ensure appropriate quality control tests are performed and managed appropriately (n=39)	12.5	0	25.6	11.9	9.1	9.1	22.8	0.01
		[B95] QARWP   Initiate and implement audit and research activities (n=33)	12.5	5	20.9	9	9.1	0	15.78	0.11

**Key:** **Academic:** Academic pharmacy; **Admin:** Administrative pharmacy; **Comm:** Community pharmacy; **Hosp:** Hospital pharmacy; **Indus:** Industrial pharmacy; **Others\*:** areas of practice with low N and included laboratory & medicines control pharmacy, military & emergency pharmacy, and pharmacy information.

Since the respondents in hospital practice were comparatively least likely to rate the 'pharmaceutical care' and 'organisation & management' behaviours as 'not relevant', further analysis was done to test the hypothesis that the "relevance rating was associated with *patient component* in area of practice". Patient component was defined as pharmacy activities that involve daily interactions with patients. Pharmacy areas that predominantly involve daily patient interactions were defined as 'patient facing' sectors and included hospital, community, and military & emergency pharmacy. Academic, administrative, industrial, laboratories & medicine control, pharmacy information practice areas were re-grouped as '*non-patient facing*' sectors (Table 3.12).

Respondents in patient facing sectors like hospital pharmacy reached consensus on relevance to practice (N 'not relevant' <10%) for five of the behaviours that showed disagreement [B6 & B20, B32, B34 & B58]. The converse was true for the respondents in non-patient facing practice areas like academic and industrial pharmacy (Table 3.12). The result is consistent with these areas of pharmacy practice since assessment of medicine and medicine use activities are not within the scope of practice of 'non-patient facing' pharmacy sectors like industrial, laboratory & medicine control, pharmacy information, and administrative pharmacy. However, the analysis only showed a statistically significant association ( $p \leq 0.05$ ) with patient facing component in respondents' area of practice for the B6, B20, B32, B90 and B95 behaviours.

Furthermore, the disagreement observed in this cluster was not fully explained by area of practice and patient component. This was because the patient facing sectors showed a lack of consensus (N 'not relevant' >10%) for the research-related behaviours (B87 & B95) in contrast to the non-patient facing sectors, although this was not statistically significant for the B87 behaviour ( $p = 0.08$ ).

**Table 3.12: Analysis of the 'not relevant' ratings in relation to patient component in practice area per competency per cluster**

Competency	Behaviour	Patient-facing sectors (N%)			Non patient-facing sectors (N%)			$\chi^2$ - value	p-value
		Not relevant	Low relevance	Relevant	Not relevant	Low relevance	Relevant		
Assessment of medicines	[B6] Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions (n=43)	9.1	21.1	69.8	18.2	22.7	59.1	6.3	0.04
Dispensing	[B13] Document and act upon dispensing errors (n=50)	11.4	11.4	77.2	18.2	11.4	70.5	2.8	0.25
	[B14] Implement and maintain a dispensing error report system and a 'near misses' report system (n=43)	10.1	13.4	76.5	14.8	6.8	78.4	3.87	0.15
Medicines	[B20] Package medicines to optimise safety [ensuring appropriate re-packaging and labelling of the medicines] (n=39)	7.4	11.7	80.9	19.3	13.6	67	11.45	0.003
Budget and reimbursement	[B32] Ensure appropriate claim for the reimbursement (n=40)	10	18.4	71.6	19.2	10.3	70.5	6.56	0.04
	[B34] Ensure proper reference sources for service reimbursement (n=34)	9.2	16.8	74	14.1	17.9	67.9	1.72	0.44
Work place management	[B58] Ensure the production schedules are appropriately plan and manage (n=35)	9.6	18.4	72	14.1	7.7	78.2	5.74	0.06
Quality assurance & research in the workplace	[B87] Apply research findings and understand the benefit risk [e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management] (n=34)	11.7	18.2	82.4	9.5	8.1	70.1	5.02	0.08
	[B90] Ensure appropriate quality control tests are performed and managed appropriately (n=39)	14.3	21.2	64.5	8.1	6.8	85.1	11.72	0.003
	[B95] Initiate and implement audit and research activities (n=33)	11.3	19.9	68.8	9.5	8.1	82.4	6.19	0.05

The ratings of relevance were further evaluated to assess whether there was an association with length of pharmacy practice experience. Length of practice was defined as number of years of post-registration/post-license pharmacy practice. Group 1 comprised respondents with less than 5years post-license practice while group 2 contained respondents with 5years

or more post-license practice experience. The 5years length of practice cut-off was chosen based on the definition of early career and advanced pharmacy practice (The Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012, p. 6)

The outcome of the analysis (Table 3.13) showed a lack of consensus in the Group 1 respondents (<5years of pharmacy practice) for the three disagreed behaviours in the 'professional and personal' cluster. This was also the case in the Group 2 respondents for the B87 (related to research) behaviour.

**Table 3.13: Analysis of the ratings in the 'not relevant' category in relation to length of practice per competency in the professional and personal cluster**

Professional & Personal Competencies (n=305)	Length of Practice						χ <sup>2</sup> -value	p-value
	< 5years (n=141)			≥ 5years (n=164)				
	Not relevant (N%)	Low relevance (N%)	Relevant (N%)	Not relevant (N%)	Low relevance (N%)	Relevant (N%)		
<b>Quality assurance and research in the work place</b>								
[B87]. QARWP   Apply research findings and understand the benefit risk [e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management]	12.1	18.4	69.5	10.4	13.4	76.2	4.06	0.391
[B90]. QARWP   Ensure appropriate quality control tests are performed and managed appropriately	17	22.7	60.3	9.2	13.4	77.4	11.641	0.005
[B95]. QARWP   Initiate and implement audit and research activities	12.7	21.3	66	9.2	13.4	77.4	7.381	0.08

The analysis also showed the weighting of relevance was significantly associated with length of practice for the B90 (related to quality control) behaviour. This suggests the early career respondents (that is, those with <5years of pharmacy practice) perceived this behaviour as not relevant to practice. This association was however not observed in the B87 & B95 (related to research) behaviours, indicating that the response rating was independent of experience.

### 3.3.5 Summary of observed disagreement

Further analysis of the ten disagreed behaviours showed the disagreement was related to area of pharmacy practice including the patient component. Respondents in non-patient facing sectors like industrial, laboratory & medicine control and pharmacy information, indicated

the disagreed behaviours in the pharmaceutical care cluster [B6 (related to assessment of medicines), B13 and B14 (related to Dispensing), B20 (related to packaging of medicines)] were not relevant to practice (Table 3.11). These respondents also indicated that the behaviours in the organisation and management cluster [B32 & B34 (related to budget & reimbursement) and B58 (related to production planning and management)] were not relevant to their practice.

On the other hand, respondents in the patient facing sectors like hospital pharmacy indicated the disagreed behaviours in the pharmaceutical care and organisation & management clusters were all relevant to their practice (Table 3.11). The three disagreed behaviours in the professional and personal cluster [B87, B90 & B95 (related to applying research findings, quality assurance and audits, respectively)] were also rated 'not relevant' to practice by respondents in the patient facing sectors. However, respondents in the non-patient facing sectors reached consensus on these behaviours (Table 3.12).

Further evaluation of the disagreed behaviours in the professional and personal cluster showed the weighting of relevance was significantly associated with length of pharmacy practice for only the B90 (related to quality control) behaviour. This association was not observed for the B87 (related to research) and B95 (related to audit and research) behaviours suggesting that the lack of consensus observed in the two groups was not related to experience (Table 3.13).



### **3.4 Comparative analysis of relevance rating by country**

The 100 behaviours in the questionnaire were further evaluated in relation to respondents' country of origin. For this analysis, only countries that had more than 50 replies— the 'high response' countries— were included. This was done to ensure the summary statistics produced from this comparative analysis could be accurately interpreted.

The ratings for the behaviours were aggregated and analysed within their respective competencies in relation to respondents' country of origin. This means, the analysis was conducted for the 20 competencies within the four competency clusters in the questionnaire. This included 426 replies from four countries (Ghana, Nigeria, South Africa and Kenya) representing 91% of the survey sample. Table 3.14 shows the number of replies per area of pharmacy practice in these countries.

**Table 3.14: Number of replies per area of pharmacy practice per country**

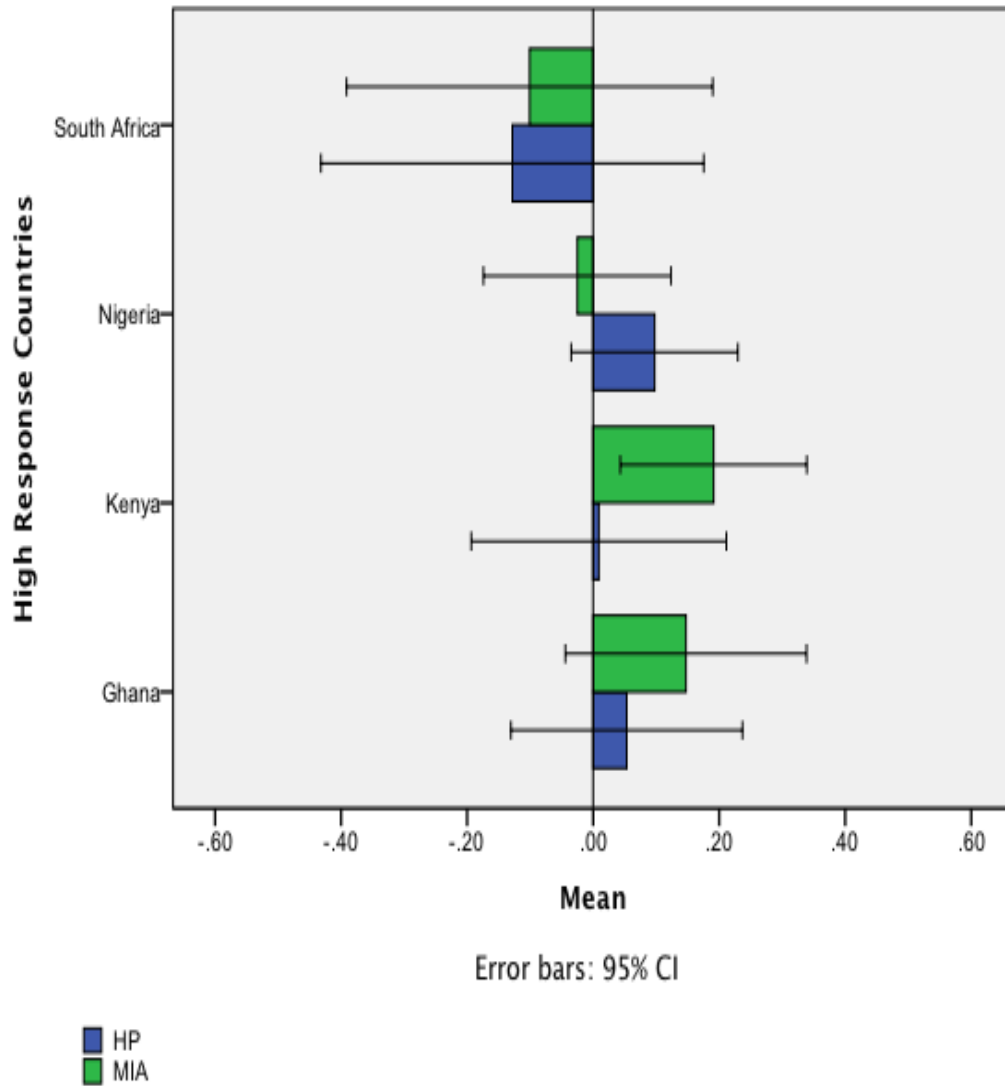
Area of practice	N Country (%)			
	Kenya	Ghana	Nigeria	South Africa
Academic pharmacy	1 (1.0)	4 (4.3)	11 (6.6)	21 (32.8)
Administrative pharmacy	6 (5.8)	13 (14.0)	4 (2.4)	2 (3.1)
Community pharmacy	2 (1.9)	10 (10.8)	41 (24.7)	10 (15.6)
Hospital pharmacy	89 (86.4)	60 (64.5)	80 (48.2)	23 (35.9)
Industrial pharmacy	1 (1.0)	3 (3.2)	26 (15.7)	6 (9.4)
Others <sup>a</sup>	4 (3.9)	3 (3.2)	4 (2.4)	2 (3.1)
<b>N Total sample (%)</b>	<b>103 (22)</b>	<b>93 (19.8)</b>	<b>166 (35.4)</b>	<b>64 (13.6)</b>
<sup>a</sup> Area of pharmacy practice with low number of replies [including pharmacy information (n=11), military & emergency (n=2) and laboratory & medicine control pharmacy (n=4)].				

### **3.4.1 Pharmaceutical public health cluster**

Figure 3.1 shows the mean  $Z$  scores per country for the HP and MIA competencies. This suggests respondents from Ghana and Kenya rated the two competencies higher in relevance than those in South Africa. It also shows that the weighting of relevance for the HP competency was highest in the Nigeria while Kenya showed the highest weighting for the MIA competency. Conversely, respondents from South Africa ranked the two competencies relatively lower in relevance than the other three countries.

Multivariate Analysis of Variance (MANOVA) showed Pillai's trace  $V = 0.025$ ,  $F = 1.809$ ,  $df = 6$ ,  $p = 0.094$ , signifying there was no statistical significant difference in weighting of relevance between the four countries for the two competencies.

**Figure 3.1: Mean relevance rating in relation to country of residence for c\mpetencies under the Pharmaceutical Public Health cluster**



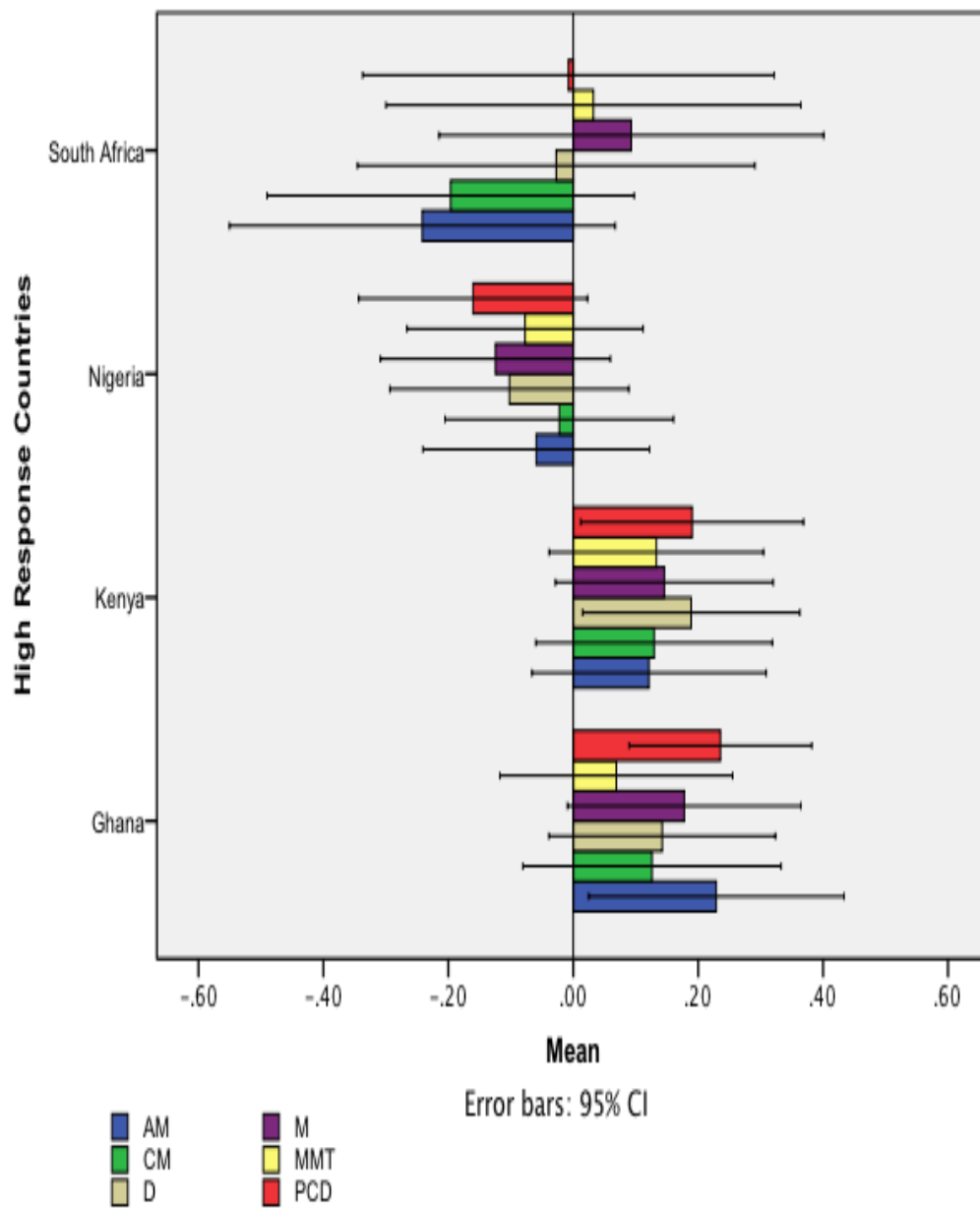
**Key:** *HP* – Health promotion competency; *MIA* – Medicines information & advice Competency.

### **3.4.2 Pharmaceutical care cluster**

Figure 3.2 illustrates disparities in mean  $Z$  scores between the four countries for the six competencies in this cluster. It implies that respondents in Kenya and Ghana rated the competencies in this cluster higher in relevance compared to respondents from Nigeria and South Africa.

Multivariate ANOVA showed Pillai's trace  $V = 0.083$ ,  $F = 1.624$ ,  $df = 18$ ,  $p = 0.048$ , indicating a statistical significant difference in weighting of relevance between the countries for the competencies in this cluster.

**Figure 3.2: Mean relevance rating in relation to country of residence for competencies under the Pharmaceutical Care cluster**



**Key:** *AM* – Assessment of medicines competency; *CM* – Compounding medicines competency; *D* – Dispensing competency; *M* – Medicines competency; *MMT* – Monitor medicine therapy competency; *PCD* – Patient consultation and diagnosis competency.

Confirmatory post hoc analysis using Bonferroni correction method showed the observed variance was within the AM and PCD competencies (Table 3.15). The analysis also showed there was a significant difference in weighting of relevance between South Africa and Ghana in the AM competency ( $p=0.049$ ), and between Nigeria and Ghana ( $p=0.021$ ), and Nigeria and Kenya ( $p=0.045$ ) in the PCD competency.

**Table 3.15: Post hoc analysis of the competencies in the Pharmaceutical Care cluster using the Bonferroni correction method.**

<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	0.244	ND		
<b>South Africa</b>	0.049	0.226	ND	
ND: No Difference; <i>P</i> = 1				
<b>Compounding Medicines (CM)</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Nigeria</b>	<b>South Africa</b>
<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	ND	ND		
<b>South Africa</b>	0.417	0.371	ND	
ND: No Difference; <i>P</i> = 1				
<b>Dispensing (D)</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Nigeria</b>	<b>South Africa</b>
<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	0.484	0.196		
<b>South Africa</b>	ND	ND	ND	
ND: No Difference; <i>P</i> = 1				
<b>Medicines (M)</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Nigeria</b>	<b>South Africa</b>
<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	0.168	ND		
<b>South Africa</b>	ND	0.257	ND	
ND: No Difference; <i>P</i> = 1				
<b>Monitor Medicine Therapy (MMT)</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Nigeria</b>	<b>South Africa</b>
<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	ND	0.742		
<b>South Africa</b>	ND	ND	ND	
ND: No Difference; <i>P</i> = 1				
<b>Patient Consultation &amp; Diagnosis (PCD)</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Nigeria</b>	<b>South Africa</b>
<b>Ghana</b>				
<b>Kenya</b>	ND			
<b>Nigeria</b>	0.021	0.045		
<b>South Africa</b>	0.916	ND	ND	
ND: No Difference; <i>P</i> = 1				

The difference between Ghana and South Africa in the AM competency was in the B6 (related to medicine interactions) behaviour. Seventy-one percent of the respondents from Ghana ranked the behaviour as 'relevant' compared to 47% in South Africa. Also, while only 7.5% of the ratings from Ghana were in the 'not relevant' category, South Africa had 15%.



This means South Africa showed a lack of consensus on relevance to practice for the B6 behaviour.

The difference between Nigeria and Kenya in the PCD competency was under the B25 (related to patient referral). None of the respondents in Kenya rated the behaviour as 'not relevant' compared to 6% in Nigeria who did. Also, 98% of the respondents in Kenya ranked the behaviour as relevant compared to 89% from Nigeria. This means more respondents in Kenya indicated the behaviour were relevant to their practice compared to the respondents from Nigeria. However, the two countries agreed that the behaviour (B25) was relevant to practice.

The difference between Nigeria and Ghana in the PCD competency was in the B27 behaviour (related to discussing with patient on medicine). None of the respondents from Ghana rated the behaviour as 'not relevant' compared to 6% in Nigeria. Also, 98% of respondents from Ghana rated the B27 behaviour as 'relevant' to practice compared to 85% in Nigeria. This means, more respondents in Ghana indicated the behaviour as relevant to practice, although, both countries agreed that the behaviour was relevant to practice.

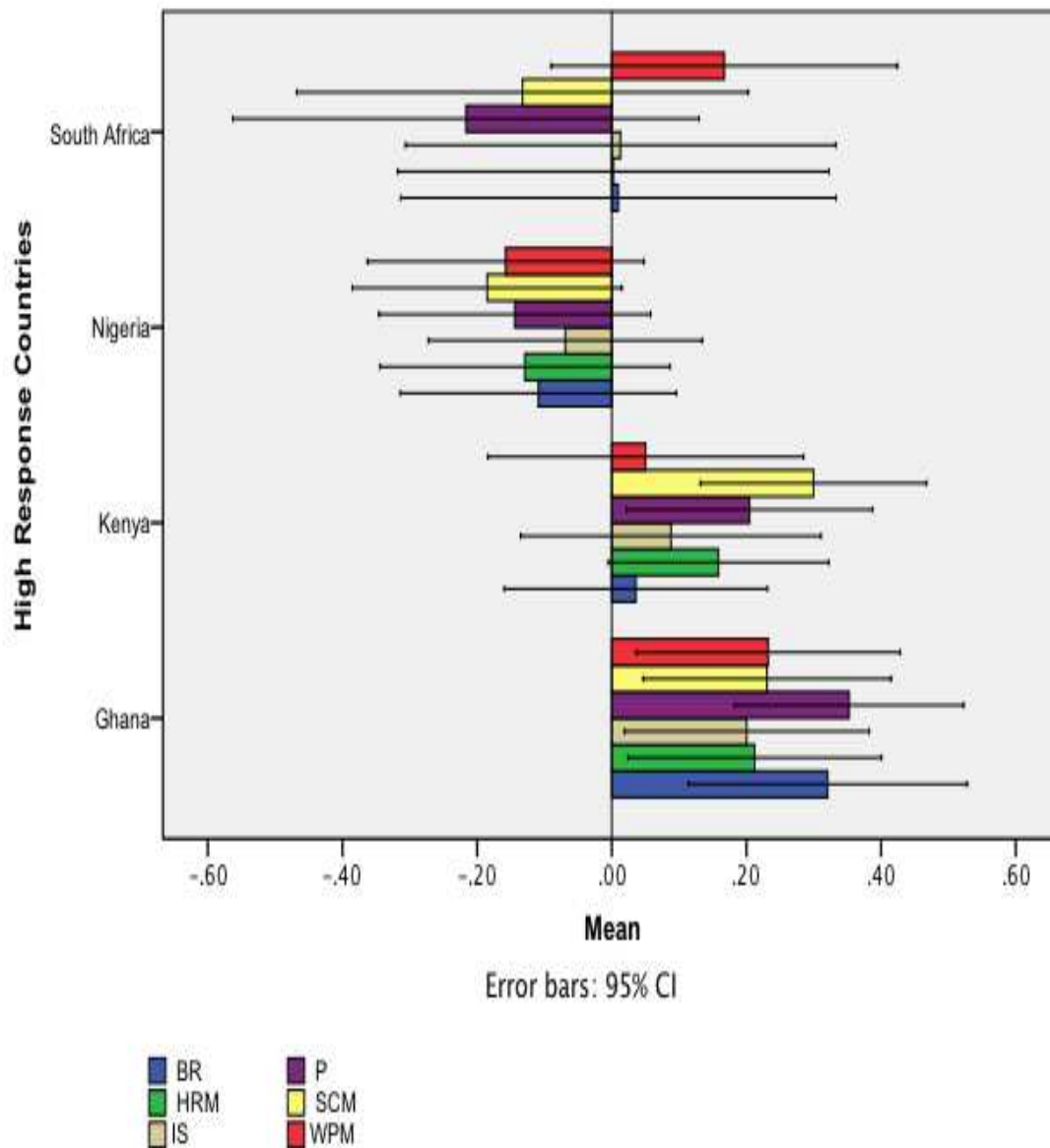
Overall, in spite of the observed disparity, only South Africa showed a lack of consensus on relevance and this was in the B6 behaviour. Consensus on relevance to practice was observed in the other countries for the B6, B25 and B27 behaviours.

Since the B6, B25 and B27 behaviours are related to assessment of medicines and medicines use, the observed difference between the countries may be due to the sample composition. Eighty-six percent of the respondents in Kenya were in hospital pharmacy in contrast to Nigeria, Ghana and South Africa with 49%, 65%, and 36%, respectively. This disparity in composition was also observed in community pharmacy area [Kenya (2%), Ghana (10%), Nigeria (26%)] (Table 3.14), suggesting that the observed disparity was due to country-specific differences in *weighting of relevance* in these three behaviours.

### **3.4.3 Organisation and management cluster**

Figure 3.3 show disparity in mean  $Z$  scores between the four countries for the competencies in the organisation and management cluster. It suggests respondents from Ghana and Kenya ranked the six competencies in this cluster higher in relevance compared to those from Nigeria and South Africa.

**Figure 3.3: Mean relevance rating in relation to country of residence for competencies under the Organisation & Management cluster**



**Key:** *BR* – Budget & reimbursement competency; *HRM* – Human resources management competency; *IS* – Improvement of service competency; *P* – Procurement competency; *SCM* – Supply chain and management competency; and *WPM* – Work place management competency.

Multivariate ANOVA showed Pillai's trace  $V = 0.136$ ,  $F = 2.279$ ,  $df = 18$ ,  $p = 0.002$ , indicating a statistical significant difference between the countries. Confirmatory post hoc analysis using Bonferroni correction method showed the difference was in the BR, P and SCM competencies (Table 3.19). It showed statistically significant difference between Nigeria and Ghana in the BR ( $p=0.030$ ), P ( $p=0.005$ ) and SCM ( $p=0.026$ ) competencies. It also showed a significant difference between Ghana and South Africa in the P competency ( $p=0.011$ ), and between Nigeria and Kenya in the SCM competency ( $0.003$ ).

**Table 3.16: Post hoc analysis of the competencies in the Organisation & Management cluster using the Bonferroni correction method.**

Budget Reimbursement (BR)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	0.482			
Nigeria	0.03	ND		
South Africa	0.591	ND	ND	
ND: No Difference; $P = 1$				
Human Resource Management (HRM)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	ND			
Nigeria	0.133	0.256		
South Africa	ND	ND	ND	
ND: No Difference; $P = 1$				
Improvement of Service (IS)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	ND			
Nigeria	0.48	ND		
South Africa	ND	ND	ND	
ND: No Difference; $P = 1$				
Procurement (P)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	ND			
Nigeria	0.005	0.079		
South Africa	0.011	0.102	ND	
ND: No Difference; $P = 1$				
Supply Chain and Management (SCM)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	ND			
Nigeria	0.026	0.003		
South Africa	0.256	0.077	ND	
ND: No Difference; $P = 1$				
Work Place Management (WPM)	Ghana	Kenya	Nigeria	South Africa
Ghana				
Kenya	ND			
Nigeria	0.068	0.922		
South Africa	ND	ND	0.373	
ND: No Difference; $P = 1$				

The difference between Nigeria and Ghana was in the B32 (related to claim reimbursement), B45 (related to procurement and payment), and B55 (related to quantification and forecasting) behaviours under the BR, P and SCM competencies respectively.

Eleven percent of the respondents from Nigeria rated the B32 (related to claim reimbursement), behaviour as 'not relevant' compared to 3% in Ghana. Also, 70% from Nigeria compared to 75% in Ghana rated the behaviour as 'relevant'. A higher percentage of the respondents from Ghana (92%) rated the B45 behaviour (related to procurement and payment) as relevant to practice compared to Nigeria (70%). The behaviour was rated not relevant to practice by 8% of the respondents from Nigeria compared to 2% from Ghana. A higher percentage of the respondents (94%) from Ghana rated the B55 (related to quantification and forecasting) behaviour as 'relevant' compared to 79% from Nigeria. Ten percent of the respondents in Nigeria rated the behaviour as 'not relevant' compared to 2% in Ghana. The result therefore show consensus on relevance to practice for B45 and B55 behaviours within Nigeria and Ghana. Nigeria however showed a lack of consensus for the B32 behaviour.

The difference between Ghana and South Africa under the P competency was in the B49 (related to tendering and evaluation of tenders and bids) behaviour. Eleven percent of the respondents from South Africa rated the behaviour as 'not relevant' compared to 5% from Ghana, while 85% in Ghana rated the behaviour as 'relevant' compared to 69% from South Africa. This means South Africa showed a lack of consensus for the B49 behaviour.

The difference between Nigeria and Kenya was in the B55 behaviour (related to quantification and forecasting). The behaviour was relevant to the practice of a higher percentage of the respondents from Kenya (95%) compared to 80% from Nigeria while 10% of the respondents from Nigeria rated the behaviour as 'not relevant' compared to 1% from Kenya. This showed that while there was disparity in the weighting of relevance, the two countries however agreed that the B55 behaviour was relevant to practice.

The disparity observed between the countries can be explained by the sample composition. Ghana had a higher percentage of its respondents in administrative pharmacy (14%) compared to Nigeria (2%). This possibly explains the disparity in perception of relevance

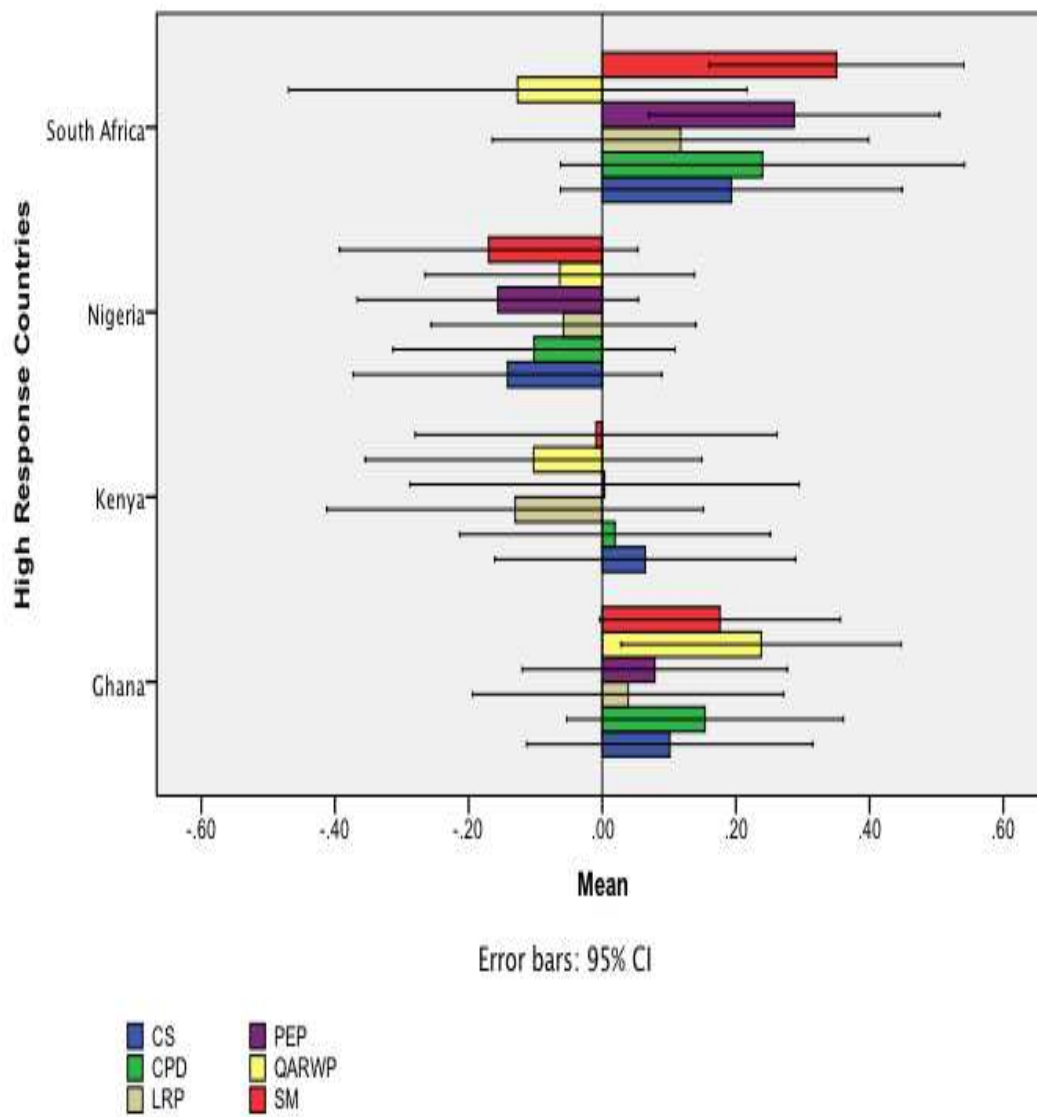
observed between Ghana and Nigeria in the B32 (related to reimbursement), B45 (related to procurement and payment) and B55 (related to quantification and forecasting of supplies) behaviours.

#### **3.4.4 Professional and personal cluster**

Figure 3.4 shows differences in mean  $Z$  scores between the four countries for the competencies in this cluster. It suggests respondents in Ghana and South Africa rated the competencies in this cluster higher in relevance than respondents in Kenya and Nigeria.

Multivariate ANOVA of the mean  $Z$  scores showed Pillai's trace  $V = 0.084$ ,  $F = 1.270$ ,  $df = 18$ ,  $p = 0.2$ . This indicates there was no significant difference in weighting of relevance between the countries for the six competencies in this cluster.

**Figure 3.4: Mean relevance rating in relation to country of residence for competencies under the Professional & Personal cluster**



**Key:** *CS* – Communication skills competency; *CPD* – Continuing professional development competency; *LRP* – Legal & regulatory practice competency; *PEP* – Professional and ethical practice competency; *QAPWP* – Quality assurance & research in the work place competency; and *SM* – Self-management competency.

### 3.4.5 Summary of comparative analysis of relevance by country

Direct comparison of the mean standard scores (Z scores) per competency showed some disparity in relevance rating between the four countries (Figure 3.1–3.4).

Multivariate ANOVA showed significant differences in perceived relevance to practice between the countries in five competencies. These competencies were the:

- 'Assessment of medicines' (AM) and 'patient consultation & diagnosis' (PCD) competencies under the pharmaceutical care cluster; and
- 'Budget & reimbursement' (BR), 'procurement' (P) and 'supply chain and management' (SCM) competencies in the organisation and management cluster.

Confirmatory post hoc analysis using Bonferroni method showed that the observed differences were between:

- South Africa and Ghana for the AM and P competencies;
- Nigeria and Ghana for the PCD, BR, P and SCM competencies; and
- Nigeria and Kenya for the PCD and SCM competencies.

The results also showed that the:

- Respondents from Ghana ranked the AM and P competencies higher than those from South Africa (Figure 3.2).
- Respondents from Ghana ranked the PCD, BR, P and SCM competencies higher than those from Nigeria (Figure 3.2 and 3.3).
- Respondents in Kenya ranked the PCD and SCM competencies higher than those from Nigeria (Figure 3.2 and 3.3).
- The analysis also showed there was no difference between the four countries for the LRP competency ( $p=1$ ).

However, despite the observed disparity in weighting of relevance, the responses did not signify a lack of consensus on relevance to practice of the behaviours. It is likely suggestive of differences in perception of degree of relevance between the countries particularly because of the composition of the sample with respect to respondents' area of practice.



### 3.5 Main Study Findings

The number of replies received per country represented in the survey ranged from 166 in Nigeria, 15 in Zambia, and 1 reply each in Namibia, Tanzania, Ethiopia and Sudan. Initial analysis of the sample composition showed that four countries each had 50 replies or more and these were classified as the high response country group. Ten countries had low number of replies (<50) and these were classified as the low response group.

The patient-facing sector made up 72.3% of the overall survey sample. It also made up 74% of the high response country group as oppose to 55.9% in the low response group. Due to the disparity in sample composition observed between the high- and low response groups, an initial assessment of homogeneity was conducted using the  $X^2$  test. This test aimed to evaluate the relationship between the weighting of relevance and the country group by comparing the relative proportions of the ratings in the two groups (Table 3.3 – 3.6).

The result of this test showed the ratings were associated with the country group for 11 behaviours. This indicates that the proportion of the rating of relevance varied with respect to country response group. This also suggests that the sample was homogenous in response for 89% of the GbCF v1 behaviours. Even though this was below the initial predefine homogeneity threshold of 90%; the responses were subsequently analysed as a group for a number of reasons including empty table cells and counts of less than five in more than 20% of the cells. Further details, and the explanation of the theoretical basis, operationalisation and inference drawn from the  $X^2$  test for homogeneity are discussed in full in the discussion section of this Chapter (3.6).

Subsequent analysis of the overall relevance ratings showed consensus on relevance to practice for 90 behaviours in the questionnaire. Disagreement was observed for 10 behaviours. These 10 behaviours were in six competencies under the pharmaceutical care, organisation & management, and the professional & personal clusters. The six competencies that contained the disagreed behaviours were the 'assessment of medicines' (AM), 'dispensing' (D), 'medicines' (M) 'budget & reimbursement' (BR), 'work place management' (WPM), and the 'quality assurance and research at the workplace' (QARWP), competencies.

The QARWP was the competency with the most disagreed behavior. It showed disagreement in 3 behaviours while the D and BR competencies each showed disagreement in two behaviours. The AM, M and WPM competencies each had disagreement in one behaviour.

The disagreement in the ten behaviours was related to area of practice and patient component— that is, the level of face-to face patient interaction in the practice areas. A statistically significant association with area of practice was observed in five (50%) of the disagreed behaviours. These were the B6 (related to assessment of medicines), B13 (related to dispensing), B20 (related to packaging of medicines), B32 (related to reimbursement) and B90 (related to quality control). These behaviours, including the B95 (related to research), also showed an association with patient component in area of practice.

Generally, respondents in non-patient facing sector like industrial, academic, administrative, laboratory & medicines control, and pharmacy information indicated the disagreed behaviours in the pharmaceutical care [B6, B13, B14 & B20] and the organisation and management [B32, B34 & B58] clusters were not relevant to their practice. On the other hand, respondents in the patient facing practice sectors like hospital pharmacy indicated these behaviours were relevant to their practice.

The result is consistent with the scope of practice of the different practice areas in pharmacy. However, area of practice and patient component did not fully explain the disagreement in the research-related behaviours (B87 & B95). This disagreement was also not explained by practice experience although consensus on relevance was observed in the non-patient facing sector and within the advanced practitioner group (that is, pharmacists with 5years or more practice experience) [Table 3.13].

Furthermore specific differences in weighting of relevance were observed between the four main countries. These differences were in 5(25%) competencies and were primarily in seven behaviours: B6 under the assessment of medicines (AM) competency; B25 & B27 under the patient consultation & diagnosis (PCD) competency; B32 under the budget and reimbursement (BR) competency; B45 & B49 under the procurement (P) competency; and B55 under the supply chain management (SCM) competency.

The disparity was between:

- Nigeria and Ghana for the PCD, BR, P, and SCM competencies;
- Nigerian and Kenya for the PCD and SCM competencies; and
- South Africa and Ghana in the AM and P competencies.

In general, Ghana and Kenya respondents generally rated these seven behaviours higher in relevance than did those from Nigeria and South Africa. The result indicates that the observed differences in four of the seven behaviours (B25, B27, B45 & B55) were not due to a lack of consensus on relevance to practice in the four countries. It rather suggested a difference in perception of the degree of relevance due to disparity in the sample composition in the respective countries.

For example, more respondents from Ghana (98%) indicated the B27, B32 and B55 behaviours were relevant to their practice compared to Nigeria (85%). Only 47% of the respondents from South Africa rated the B6 behaviour as relevant to practice compared to 71% in Ghana and Nigeria, and 77% in Kenya. A higher number of respondents in Kenya (98%) indicated the B25 and B49 behaviours were relevant to their practice compared to Nigeria (89%) and South Africa (90%) [this comprised the proportion of the ratings in the 'relevant' category only, and does not include the rating in the 'low relevance' category].

Overall, a lack of consensus on relevance to practice was observed in the Nigeria group for the B32 (related to reimbursement) behaviour, and the B6 (related to assessment of medicines) & B49 (related to tenders and bids) behaviours for South Africa. Full discussion of the study findings is provided in the discussion section of this chapter (3.6).

## **3.6 Discussion**

### **3.6.1 Methodology**

The goal of this study was to evaluate pharmacists' perception of the relevance to practice of the GbCF v1 competencies in countries in Africa. The study explicitly evaluated perception via an online survey using a 4-point Likert scale. The study findings show that 90% of the behaviours in the framework are relevant to practice for the survey respondents. However, majority (~91%) of the survey respondents were from four African countries: Ghana, Kenya, Nigeria and South Africa. This suggests that the findings of the research are likely to have limited generalisability beyond these four countries.

Most of the survey respondents (72.3%) were in hospital and community pharmacy practice while academic, industrial, and administrative pharmacy each made up less than 10% of the survey sample. On the other hand, respondents from three practice areas: laboratory & medicine control, military & emergency, and pharmacy information, comprised less than 5% of the total survey sample. Though it is probable that the sample composition may be reflective of the general pharmacy population in the countries represented in the survey as suggested by available estimates (International Pharmaceutical Federation, 2012; Royal Pharmaceutical Society of Great Britain, 2009); the lack of accurate census data and the non-stratified and non-probabilistic sampling method used in this study makes it difficult to be certain of this.

A combination of convenience and snowball sampling technique was used in this study. Even though this non-probabilistic sampling approach is a potential source of bias, the methods were chosen due to challenges with access to pharmacists in the African region and the limited resources available as discussed earlier under the methodology section of this chapter (3.2). Furthermore, the sampling strategy used for this study is in line with published research that have evaluated pharmacists' perception of the competencies contained in a framework [(Carrington et al., 2012; Jones et al., 2012; Atkinson et al., 2015; Jackson et al., 2015; Bruno, (2011)]. This suggests that the methods used were within reason and evidence-based.

Evaluating pharmacists' perception of a competency framework via an online survey as was done in this research is an established and pragmatic evidence-based methodology in pharmacy practice. For example, Atkinson and colleagues (2015) evaluated perception of the competencies in the Quality Assurance in European Pharmacy Education and Training (PHAR-QA) Framework via an online survey. Bruno (2011) and Jackson et al., (2015) evaluated pharmacists' perception of applicability to practice of the FIP Global Competency Framework and the Advanced Pharmacy Practice Framework of Australia (APPF), respectively, via an online survey while Maitremit et al., (2008) evaluated applicability of the competencies in the Standard Criteria for Pharmacy Practitioners in Thailand Framework via a postal survey. The aforementioned studies also used a Likert scale to rank relevance to practice of the competencies contained in the respective frameworks.

In line with published research, respondents' perception of the relevance to practice of each of the 100 GbCF v1 behaviours was assessed in this study using a four point Likert Scale. General agreement was evaluated by comparing the proportion (percentage) of the overall ratings in each category on the scale. A threshold of ten percent (or less) of the total ratings in the 'not relevant' category was predefined as indicative of agreement on relevance to practice. This indicates that consensus was attained on a given behaviour when at least 90% of respondents rated the behaviour relevant to practice (this included the low relevance ratings).

Although published research in health service evaluation and related fields have defined consensus as 70% (Sumsion, 1998) and 75% (Jones and Hunter, 1995) agreement, the threshold (90%) used in this research was defined empirically based on the result of the global online survey conducted by Bruno (2011) that involved pharmacists from 64 countries. This was done to ensure consistency of evidence given that while this present study focused regionally on countries in Africa, the study by Bruno (2011) evaluated the global pharmacy workforce using the same GbCF v1 questionnaire. As such, it was imperative for the threshold of agreement to be the similar. This threshold is also in line with other studies that have defined consensus as 90% (Herdman et al., 2002; Hulley et al., 2015; Schweigert, 2011).

### 3.6.2 Homogeneity of the survey responses

Survey replies were received from 14 countries in Africa with disparity observed in the number of replies received per country. An initial evaluation of homogeneity of the responses in the survey sample was therefore undertaken using the  $X^2$  test. The test aimed to evaluate whether the countries represented were homogenous in respondents' ratings of relevance for each of the 100 behaviours in the questionnaire. Regrouping the represented countries into a high- and low response group was carried out with respect to the number of replies received in the survey (please see section 3.3.2). This regrouping produced a 3x2 contingency table and the significance level ( $\alpha$ ) was predefined as 0.01.

Although a number of published research in health service evaluation and social research have predefined  $\alpha$  as 0.05; the conservative  $\alpha$ -level of 0.01 that allowed only a 1% (or less) probability of obtaining a value as high as the  $X^2$ -value when the null hypothesis is true, was chosen *a priori* for this analysis. This was done to curtail the risk of making a type 1 error (Banerjee et al., 2009) and limit the potential for error due to chance particularly because of the disparity in composition and areas of pharmacy practice that was likely to be observed in the countries represented in the survey (International Pharmaceutical Federation, 2012, 2009; International Pharmaceutical Federation (FIP), 2015), as was obtained in this research. For example, majority (74%) of the respondents in the four countries in the high response group in this survey were mainly in patient facing roles (hospital and community pharmacy areas). This is in contrast to the low response group that had 54.7%. This indicates that close to half (44.3%) of the respondents in the low response group were in the non-patient facing areas of practice compared to the high response group with about a fourth (26%), therefore signifying disparity in sample composition between the two groups (Table 3.2).

Furthermore, evidence suggests that the approximate statistic produced by the  $X^2$  test is imprecise in small samples (Bewick et al., 2004; Cohen, 1988; Weisburd and Britt, 2007a). This increases the probability of obtaining a statistically significant p-value (Armitage and Berry, 2002; Campbell, 2007; Field, 2007) and even though consensus on definition of 'small' or 'large' samples is currently lacking, Campbell (2007) and Agreti (1990) suggests that a contingency table with expected count of less than 5 in any of the table cells is likely to be from a small sample. Since counts (frequency) of less than five was observed in 61 of the

GbCF v1 behaviours (Table 4.4-4.6), a conservative  $\alpha$ -level of 0.01 was therefore appropriate in order to limit the risk of a type 1 error.

The outcome of the  $X^2$  test indicated that the distribution of the ratings in the relevance categories (this means, the 'not relevant', 'low relevance' and 'relevant') was not associated with the country response group for 89 behaviours. This suggests that for these 89 behaviours, the proportion of the responses in the categories on the aggregated Likert scale (that is, the observed frequencies in the 'not relevant', 'low relevance', and 'relevant' categories) were similar to that expected from a binomial distribution, for the low and high response country groups, respectively. This showed that the two cluster groups were homogenous in their responses for 89% of the GbCF v1 behaviours. Even though this was below the predefined threshold of 90%, homogeneity of the survey sample was still assumed for a number of reasons:

- At least one empty cell (that is,  $n=0$  in either the high or low response country group) was observed in 20 behaviours in the questionnaire. In such instances, the  $X^2$  test interprets the empty cell as an absence of observation indicative of a deviation from expected frequency and therefore produces a significant p-value. However these cells were mainly in the low response group and were likely due to a lack of data and not an absence of observation. For example, compared to the high response country group ( $n=426$ ), the sample composition of the low response group ( $n=43$ ) indicated that a number of areas of practice were not represented (Table 3.2). Even though attempts were made to boost survey replies in this research using monthly reminders and follow-up emails, the number of replies received from the low response group countries was still comparatively low. This feature led to the lack of data observed in some areas of practice in the low response countries.
- Despite the small numbers in some of the table cells, the convention of using Fisher's test instead of the  $X^2$  test when the expected count is less than 5 in a 2x2 contingency table (Cochran, 1954, 1952; Cohen, 1988; Freeman and Julious, 2007; MacDonald and Gardner, 2000) was not appropriate since a 3x2 contingency table was produced in the analysis. Although the response categories could have been further aggregated and dichotomised into 'not relevant' and 'relevant' so as to produce a 2x2 contingency

table for a Fisher's test; this was not done as it would have led to a loss of information with respect to the behaviours that were rated 'low relevance' to practice by the respondents. This would have made it difficult to interpret the study results and distinguish between the behaviours that were rated 'relevant' versus those rated as 'low relevance'.

- Also, available evidence from theoretical calculations (Storer and Kim, 1990) and computational simulations (Richardson, 1990) show that Fisher's test produces conservative p-values in small samples, especially when the degree of freedom is greater than 1. This leads to a likelihood of obtaining a non-significant result (Campbell, 2007; Field, 2007), especially when the contingency table contains 'both small and large expected frequencies' (Agresti, 1990, p. 49). Although Yates (1934), Fleiss (1981) and Yates *et al* (1999), suggest applying the Yates continuity correction to the  $X^2$  test when the expected count is less than 10 but greater than 5 in more than 20% of the table cells; this two approaches were not appropriate for use in this study because evidence suggests the Yate's correction overly adjusts the  $X^2$  statistic in small samples and produces p-values that are large and likely to be non-significant (Armitage and Berry, 2002; Howell, 2009).

Overall, the relevance ratings provided by the respondents in countries with low and high number of replies in the survey suggests broad similarity in weighting of relevance for majority (89%) of the GbCF v1 behaviours. This indicated that the survey respondents were homogenous in their responses irrespective of country of origin and the disparity in the number of replies received per country represented. It also suggested similarity in the perception of relevance of the GbCF v1 behaviours. This is in line with previous research (n=490) involving practitioners in 64 countries (n=490) that have shown consensus on relevance to practice of the GbCF v1 behaviours (Bruno, 2011). It is also in line with other published studies that have shown the applicability of a framework developed in United Kingdom (the General Level Framework, now renamed the RPS Foundation Level Framework) to practitioners in Australia (Coombes et al., 2010), Croatia (Meštrović et al., 2012), Singapore (Rutter et al., 2012) and Serbia (Svetlana et al., 2014). This finding adds to evidence that show that there exists a core set of behaviours (and competencies) that are generally applicable to practitioners in different countries.



### 3.6.3 Overall perception of the relevance to practice of the GbCF v1 behaviours

The results of the cross-sectional survey demonstrate consensus on relevance to practice for 90 behaviours in the framework. This included all the behaviours in the 'pharmaceutical public health' cluster, 84% of the behaviours in the 'pharmaceutical care' cluster, 90% of those in the 'organisation and management' cluster, and 92% of the behaviours in the 'professional and personal' cluster.

More than 92% of the total ratings were in the 'relevant' category for all behaviours in the pharmaceutical public health cluster (Table 3.7). At least 75% of the overall ratings were in the 'relevant' category for all the behaviours in the pharmaceutical care (Table 3.8) and organisation & management (Table 3.9) clusters. However, the competencies in the professional & personal cluster received comparatively less weighting of relevance with at least 70% of the overall ratings in the 'relevant' category for all its behaviours (Table 3.10). This was not inclusive of the ratings in the 'low relevant' and 'not relevant' categories, suggesting that at least 70% of the survey respondents agreed that all the behaviours in the questionnaire were *relevant* or *highly relevant* to their practice. The finding is in line with the study by Bruno (2011), which showed that at least 70% of the respondents ranked all the behaviours in the questionnaire as 'relevant'. Similarly, the Bruno (2011) study also showed that the behaviours in the professional and personal cluster of the GbCF v1 received the least weighting of relevance in relation to the other three clusters in the questionnaire, as was obtained in this research.

Inspection of the frequency table (Table 3.10) showed that the behaviours with least weighting in the professional & personal cluster were related to business (B76), marketing (B79), quality control (B90) and research (B87 & B95). The composition of the sample may explain the ratings for these behaviours since over two thirds of the respondents were in hospital and community practice and therefore are not routinely involved in marketing, business and quality control activities (Table 3.1). The sample composition did not however explain the relative lower weighting of relevance observed for the research-related behaviours (B87 & B95). The rating of these research-related behaviours suggests that the survey respondents perceived these behaviours to be relatively less relevant to their practice compared to the pharmaceutical care behaviours for example. This is in line with the findings

from other research that have shown that pharmacists' generally perceived research-related competencies as less important for their practice (Atkinson et al., 2015; Kennie-Kaulbach et al., 2012).

Disagreement was observed in ten behaviours. This included four behaviours in the pharmaceutical care cluster [B6 (related assessment of medicines), B13 & B14 (related to dispensing), and B20 (related to medicines)]; three behaviours in the organisation & management cluster [B32 & 34 (related to reimbursement), & B58 (related to planning production)]; and three in the professional & personal cluster [B87 (related to research), B90 (related to quality control), & B95 (related research)]. The disagreement in the pharmaceutical care and organisation & management clusters was related to area of pharmacy practice and patient-facing component in daily practice. Respondents in the patient facing sectors generally reached consensus on relevance for the disagreed behaviours under the pharmaceutical care [B6, B14 & B20] and the organization and management [B32, B34 & B58] clusters in contrast to respondents from the non-patient facing sectors including academic and administrative pharmacy.

This finding is consistent with evidence from previous research by Bruno (2011) that showed that respondents in non-patient facing sectors like academic, laboratory & medicine control, and industrial pharmacy rated these same behaviours as not relevant to their practice. It is also in line with the scope of practice of pharmacists in this sector since they do not routinely carry out medicine use and medicine assessment activities.

On the other hand, a high percentage (>10%) of the respondents in academic, community, and hospital pharmacy rated the disagreed behaviours in the professional and personal cluster [B87 (related to applying research findings) and B95 (related to audit and research activities) behaviours] as 'not relevant' to practice. These ratings were independent of length of practice experience with the result showing a lack of consensus on relevance (N 'not relevant' >10%) in the early career (<5years practice experience) and advanced ( $\geq 5$  years experience) practitioners (Table 3.13). Even though the respondents in the non-patient facing sectors reached consensus on relevance for the B87 & B95 behaviours under this cluster; the disagreement in the cluster was still not consistent with or fully explained by area of practice or patient component, particularly because research-related skills are necessary for

pharmacists in both the non-patient and patient facing sectors [Table 3.11, 3.12 & 3.13]. Two other research-related behaviours (B88 & B93) also had  $\geq 20\%$  of the total rating in the 'not relevant' and 'low relevance' categories.

These findings add to the increasing body of evidence from other studies that suggests that pharmacists are not routinely involved in research (Armour et al., 2007; Awaisu et al., 2014; Fagan et al., 2006; Rosenbloom et al., 2000) and generally view research-related competencies to be of low relevance to practice (Hébert et al., 2013; Kanjanarach et al., 2012; Liddell, 1996; Saini et al., 2006). It also is in line with the findings of three studies (Kennie-Kaulbach et al., 2012; Carrington et al., 2012 and Atkinsons et al., 2015) included in the systematic literature review reported in Chapter 2 of this thesis. Respondents in these later studies ranked the research-related behaviours in the respective frameworks low in relevance. They reported time constraints due to workload and lack of support as some of the barrier to participation in research-related activities in the workplace.

This finding is significant for the global pharmacy workforce particularly because it suggests that if research-related competencies and behaviours are perceived as not relevant, or of low relevance for practice by the survey respondents; then it is likely these pharmacists may be less motivated or inclined to develop their research skills. The ratings of these behaviours also suggest that these pharmacists are not routinely involved in research-related activities. This is of concern given that demonstrating the value of the pharmaceutical services provided by pharmacists require evidence from well designed and high quality health service evaluation and research studies. As such the availability of practitioners that are equipped with research skills is paramount for the global pharmacy workforce.

A high proportion ( $\geq 20\%$ ) of respondents in community pharmacy perceived the B13 and B14 (related to dispensing) behaviours as not relevant to their practice [Table 3.13]. Evidence suggest this may be related to the peculiarities of community pharmacy practice in countries with severe health workforce shortages (Adje and Oli, 2013; Erdogan et al., 2012; Machula, 2007; Toklu et al., 2010). Research conducted in countries like Nigeria (Adje and Oli, 2013), India (Basak and Sathyanarayana, 2009), Pakistan (Rabbani et al., 2001), Lao (Stenson et al., 2001) and Zambia (Machula, 2007) suggests that dispensing activities in community

pharmacies are mainly carried out by pharmacy assistants, and in some instances by untrained sales personnel or clerks. This feature may explain the perception of these 'dispensing' behaviours as not relevant by community pharmacists. It also underscores the need for formal review and training programmes for community pharmacists and their support staff as this poses a high risk potential for patient harm.

#### **3.6.4 Perception of relevance to practice of the GbCF v1 competencies in relation to respondents' country of origin**

Country-specific differences in weighting of relevance were observed in seven (7%) behaviours under 5(25%) competencies. This disparity was in the B6 (Assessment of medicines – M competency), B25 & B27 (Patient consultation and diagnosis - PCD competency), B32 (Budget and reimbursement - BR competency), B45 & B49 (Procurement - P competency), and B55 (Supply chain and management - SCM competency) behaviours. However, only Nigeria and South Africa showed a lack of consensus on relevance to practice for three of these behaviours. These were the B32 (related to reimbursement) for Nigeria, and B6 (assessment of medicines) & B49 (related to tenders and bids) behaviours for South Africa. This suggests that the observed disparity was not indicative of a lack of consensus for the other four behaviours: B25, B27, B45, and B55. It is likely to be indicative of the inter-country differences in perception of relevance. For example, more respondents from Ghana (98%) rated the B27, B32 and B55 behaviours 'relevant' to practice compared to Nigeria (85%). Only 47% of the respondents from South Africa rated the B6 behaviour as relevant compared to 71% in Ghana and Nigeria, respectively, and 77% in Kenya. More respondents from Kenya (98%) rated the B25 and B49 behaviours as 'relevant' compared to Nigeria (89%) and South Africa (90%) respectively.

The observed disparity is likely due to the sample composition in the respective countries. Kenya had a higher percentage of the respondents in hospital practice (86%) while Nigeria and South Africa on the other hand had less than 50%. More than a third of the respondents from South Africa were in academic pharmacy compared to Nigeria, Kenya and Ghana that had less than 7%.

Overall, though the MANOVA and post-hoc test indicated country-specific differences in weighting of relevance for seven behaviours, only two countries showed a lack of consensus on relevance to practice for three (B6, B32 & B49) behaviours. It can therefore be argued that the GbCF v1 competencies are relevant to practice but with specific inter-nation differences in weighting of relevance between the four countries for these seven GbCF v1 behaviours. This is in line with studies that have shown the existence of core competencies that are relevant and applicable to pharmacy practitioners in different countries (Bruno, 2011; Coombes et al., 2010; Meštrović et al., 2012; Rutter et al., 2012).

### **3.7 Study Limitations**

This study has a number of potential sources of bias:

- Online surveys are generally associated with low response rates particularly because it restricts the target populations to individuals with Internet access (Bowling, 2009; de Vaus, 2002). This feature possibly played a role in the comparatively low replies received from ten of the 14 African countries represented in this survey. However, this limitation could not be circumvented because of the geographical location of potential respondents, cost implication of postal and interview surveys, and the data protection laws of the United Kingdom (from where this study was implemented) that precluded the use of other survey methods.
- The dissemination of the survey invite via the FIP media team meant that only the pharmacists or pharmacy organisations affiliated with FIP were asked to participate in the survey. This therefore excluded potential participants who are pharmacists and who practice in countries in Africa, but are not members of the respective national or regional leadership bodies or the FIP. Since the survey invite was disseminated via the FIP network; it implied that only the 35 FIP member organisations representing twenty-three African countries were contacted and invited to participate. This also means that 33 countries in Africa were automatically excluded from the study. This limitation could not be avoided given that a lack of direct access to membership lists or contact persons within the membership organisations in this region made the dissemination of the survey invite via the FIP media team the only practical approach.

- The survey questionnaire was only available in English language. As such this automatically excluded potential respondents from non-Anglophone African countries that may otherwise have been interested in participating, therefore precluding the generalisability of the survey findings to these countries. Also, repeated attempts to contact representative FIP membership organisations in the non-Anglophone countries were unsuccessful and therefore precluded the need to use translated versions of the survey questionnaire.
- The length of the survey questionnaire (105 questions presented over six pages) may have negatively impacted on the number of survey replies. This was particularly obvious with the consistent decrease in number of replies per additional page of questionnaire. This could not be avoided given that the survey questionnaire was wholly reproduced from the GbCF v1. As such, the length of the questionnaire could not be shortened. Nevertheless, evidence shows that the decrease in number of replies per additional page of the questionnaire does not affect the overall quality of the responses (Iglesias and Torgerson, 2000).
- Majority (72.3%) of the total survey respondents were in patient facing roles (hospital and community pharmacy; Table 3.1). As such the survey obtained limited data from respondents in non-patient facing roles like industrial, academic and administrative pharmacy. This therefore makes it difficult to generalise the findings of this research to practitioners in these areas of practice. Based on the sample composition, it is likely that the study may have benefitted from a stratified sampling approach to ensure all the pharmacy practice areas were adequately represented in the sample. However, the lack of census data and lack of access to country-level membership lists due to the confidentiality and data protection laws of the United Kingdom (where the study was conducted), made it impractical to use a quota or stratified sampling approach in the study.
- Although, some authors have indicated that the anonymity provided by web-based surveys may provide an avenue for the submission of survey replies from ineligible participants (Bowling, 2009; Bryman, 2012; de Vaus, 2002); the risk of this was limited in this study since the URL link to the online survey was mainly distributed through the FIP membership organisations. Also, the demographic information

required respondents to indicate whether they were registered pharmacists or intern/pre-registration candidates (Appendix 5). As such, it would have been possible to exclude non-pharmacists from this analysis, although this was not necessary as all the respondents indicated that they were either registered or intern pharmacists.

Overall, the convenience and chain sampling strategy and the consequent difficulty with calculating the survey response rate as explained earlier in the methodology section (3.2.4; p.107), biases the study findings and limits its generalisability even for the four countries with high responses in the survey sample.

## **Chapter 4 IDENTIFYING AND EVALUATING ADVANCED PHARMACY PRACTICE COMPETENCIES IN A GLOBAL CONTEXT**

In 2010, FIPed developed the FIP Global Competency Framework (GbCF v1). This framework was specifically designed to serve as a source document containing the core pharmacy practice competencies expected of early career pharmacy practitioners (this means, pharmacists with less than five years practice experience) globally. Since its development, the GbCF v1 has been successfully used to design pre-service education and training curriculum for undergraduate pharmacy students (International Pharmaceutical Federation (FIP), 2013). It has also been used to develop country-specific frameworks for in-service practitioners in many countries including Ireland (The Pharmaceutical Society of Ireland, 2013) and the Pacific Island Countries (Brown et al., 2012b). Further studies have validated the GbCF v1 using evidence from sixty-four countries (Bruno, 2011).

The validation of the GbCF v1 and its subsequent use as a mapping tool for the development of country-specific frameworks around the world, alongside similar evidence from the field of medicine, has underscored the importance of a global competency framework. Further work is now necessary to identify the core competencies required for global advanced pharmacy practice.

### **4.1 Study Design**

A literature review was conducted to identify the methodological processes used in the development of competency frameworks. The review identified four key methods. These are:

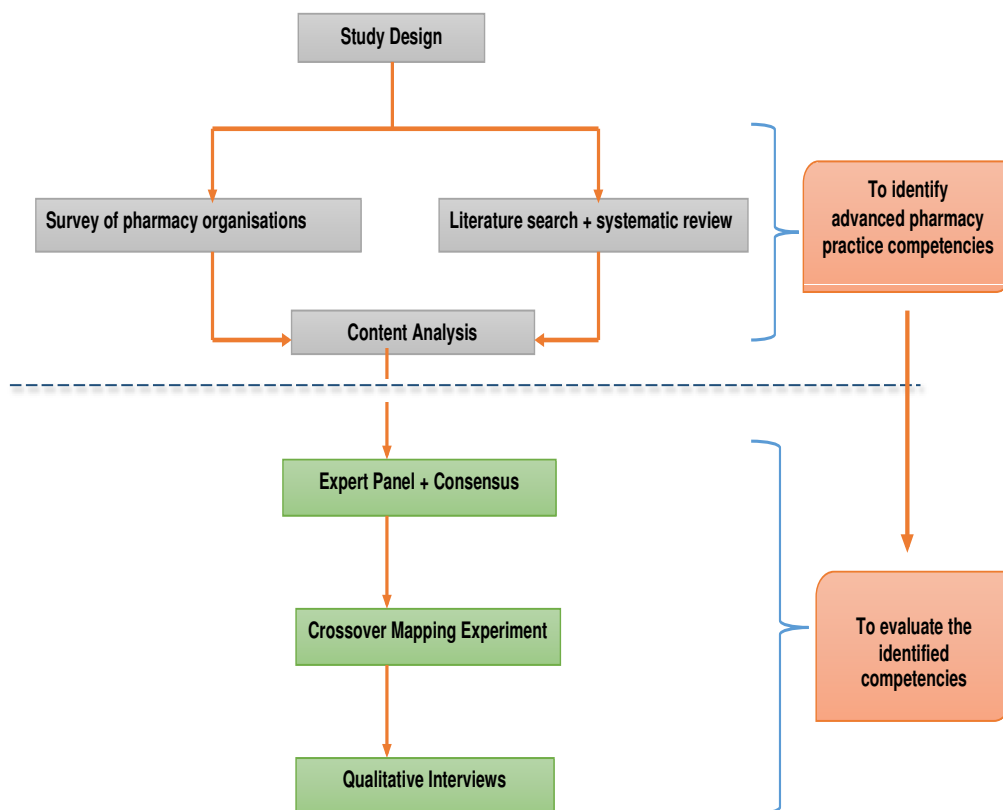
- Systematic literature reviews;
- Expert group and stakeholder consultation;
- Consensus development methods; and
- Profession-wide consultations and surveys.

In line with these methods, this study was conducted in five stages. The aim and design of each stage was:



- Stage 1:** Systematic literature search, review and survey of pharmacy organisations to identify any existing framework or practice standards for advanced pharmacy practice
- Stage 2:** Content analysis of such frameworks/standards to identify and extract the competencies and behaviours that described advanced pharmacy practice
- Stage 3:** Expert review of the outcome of content analysis and consensus development
- Stage 4:** Evaluation of the competencies via a crossover mapping experiment and
- Stage 5:** Qualitative interviews to obtain practitioner inputs and evaluate perceptions of the identified competencies.

The objectives of each of these stages are presented under the relevant sections.



**Figure 4.1: Schematic of the study design**

## **4.2 Stage 1 | Systematic Literature Search and Survey of Pharmacy Organisations**

The objective of this stage was to identify national or regional competency frameworks for advanced pharmacy practice.

A 2012 global survey of pharmacy organisation and professional bodies conducted by FIPED identified two frameworks for advanced pharmacy practice (International Pharmaceutical Federation, 2012). These frameworks: the Royal Pharmaceutical Society Advanced Pharmacy Framework (RPS-APF) and the Advanced Pharmacy Practice Framework for Australia (APPF); were developed from similar bibliographic sources and adapted to the local needs of the pharmacy workforce in the United Kingdom and Australia respectively (Royal Pharmaceutical Society of Great Britain, 2013b; The Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012).

The Australia APPF was adapted from five advanced practice frameworks developed specifically for paediatrics, critical care, emergency medicine, cardiology, and oncology pharmacy in Australia (Jackson et al, 2015). These five frameworks were all designed and mapped to the Competency Development and Evaluation Group (CODEG) Advanced to Consultant Level Framework of the United Kingdom (AcLF), and adapted to the needs of the Australian pharmacy workforce in the respective clinical care areas (Jackson et al., 2015a, 2015b). Since its development, the AcLF has undergone a number of expert reviews, consensus and profession wide consultations culminating in its adoption by the Royal Pharmaceutical Society of Great Britain as the national framework for advanced pharmacy practice in the United Kingdom. The framework was then renamed the RPS Advanced Pharmacy Framework (RPS-APF) (Royal Pharmaceutical Society of Great Britain, 2013b).

A literature search to identify other competency frameworks specific for advanced pharmacy practice (presented in Chapter 2 of this report) did not yield any additional national frameworks.

The frameworks from America (American College of Clinical Pharmacy, 2008b) and Canada (National Association of Pharmacy Regulatory Authorities, 2014b) contained competencies for specialised clinical pharmacy roles. Even though these frameworks are designed for complex clinical roles—which are a form of advanced pharmacy practice— they contained non-generic competencies that are not applicable to roles outside the specified specialties. As a result, these frameworks were not appropriate for inclusion in this study.

A subsequent 2014 global survey of national pharmacy organisations by FIPeD also did not yield any new framework for advanced pharmacy practice (International Pharmaceutical Federation, 2014).

### **4.3 Stage 2 | Content Analysis of Advanced Pharmacy Competency Frameworks**

The goal of this phase was to identify and extract the competencies and behaviours that describe the different levels of advanced pharmacy practice in the identified frameworks.

The key objectives were:

- i. To identify and categorise the emergent themes from the two frameworks
- ii. To extract the specific competencies contained in the frameworks
- iii. To cross-match and map the competencies and behavioural descriptors in the two frameworks.

#### **4.3.1 Methodology**

A qualitative content analysis of the two frameworks was conducted based on the method described by Krippendorff (2013, p.84). To minimise subjectivity, the analysis was conducted semantically in accordance with the manifest content of the text in each framework. This means it was done based on the language used to describe the text. AU (the researcher) carried out an initial and iterative examination of the overall content of the two frameworks. This resulted in the identification of the patterns and themes in the two frameworks.

The cluster headings and level of practice labels in the two frameworks were then identified, categorised and cross-matched (Table 4.1 & 4.2). The themes that were broadly based on the identified cluster headings were collated to form a template. This template was used to extract and cross-match the competencies and the corresponding behaviours in the two frameworks (Table 4.3).

The semantic differences in the labels of the cluster headings, level of practice, competencies, and in the description of the behaviours were identified and highlighted. The outcome of the content analysis was represented in a grid and presented to an expert panel for consensus development. This was done to limit subjectivity and assure the reproducibility and reliability of the research outcomes.

#### **4.3.1.1 Data handling and analysis**

The first objective of the content analysis was to identify patterns and categorise the emergent themes in the two frameworks. An initial categorisation was done in relation to the cluster headings and level of advanced practice identified in the frameworks.

The cluster headings were first categorised with six clusters identified in the RPS-APF (UK) and five in the APPF (Australia). Observed semantic differences between the cluster headings in the two frameworks were underlined. Six broad themes were then developed from these cluster headings. Table 4.1 gives the cluster headings and the themes developed.

**Table 4.1: Domain headings in the RPS-APF (UK) and APPF (Australia)**

<b>Themes</b>	<b>RPS-APF (UK)</b>	<b>APPF (AU)</b>
Expertise and expert skills	Expert professional practice	<a href="#">Expert professional practice</a>
Collaborative practice	Collaborative working relationship	<a href="#">Communication, collaboration and teamwork</a>
Leadership	Leadership	<a href="#">Leadership and management</a>
Management	Management	
Education, training & professional development	Education, training and development	<a href="#">Professional and ethical practice</a>
Critical appraisal, evaluation and research	Research and evaluation	<a href="#">Critical analysis, research and education</a>

The next categorisation involved identifying the distinct level of advanced pharmacy practice described in the two frameworks. Three levels of advanced pharmacy practice were identified in each framework. Semantic differences in the labels of the levels of practice were also identified. The levels of practice increased in complexity from *advanced stage 1* to *Mastery* in the RPS-APF, and from *transition* to *advanced level* in the APPF.

Table 4.2 shows the labels for the stages/levels in the two frameworks (items from the APPF are shown in **blue** font).

**Table 4.2: Levels/Stages of advance practice in the RPS-APF (UK) and APPF (Australia)**

RPS-APF (UK)	APPF (AU)
Advanced stage 1	Transition level
Advanced stage 2	Consolidation level
Mastery	Advanced level

The second objective of the content analysis was to identify and extract the specific competencies contained in the two frameworks. Themes developed from the cluster headings (shown in Table 4.1) were collated and used to extract the competencies in the two frameworks. Semantic differences in the competency labels were observed between the frameworks. These differences in the labeling of competencies are underlined in Table 4.3.

The third objective of the content analysis was to match the extracted competencies with the respective behavioural descriptors in the two frameworks. Again, the themes and competency labels formed the template used for this matching.

**Table 4.3: Themes and sub-themes derived from the two frameworks including the corresponding competencies**

THEMES	SUB-THEMES	CORRESPONDING COMPETENCIES	
		RPS-APF (UK)	APPF (AU)
Expertise and Expert Practice	Expert skills	Expert skills and knowledge	<u>Acquire expert skills and knowledge</u>
	Delivery of expertise	Delivery of <u>professional expertise</u>	<u>Deliver accountable and flexible patient care</u>
	Professional autonomy	Reasoning and judgment	<u>Use reasoning and judgment</u>
	Reasoning & judgment	Professional autonomy	<u>Professional autonomy</u>
Collaborative Practice	Communication	Communication	<u>Use appropriate communication skills</u>
	Team work & consultation	Team work and consultation	<u>Engage in team work</u>
Leadership	Strategic context & planning	Strategic context	<u>Understand strategic context and contribute to strategic planning</u>
	Governance	Governance	<u>Understand and contribute to clinical governance</u>
	Vision	Vision	<u>Understand and contribute to strategic vision</u>
	Innovation & service delivery	Innovation Service development	<u>Contribute to innovation and service development</u>
	Motivation	Motivation	<u>Motivates self and others</u>
Management	National priorities	Implementing national priorities	<u>Support and assist implementation of national priorities</u>
	Resource Utilisation	Resource Utilisation	<u>Understand and contributes to effective use of resources</u>
	Standards of practice	Standards of practice	<u>Applies and monitors standards of practice</u>
	Managing risk	Managing risk	<u>Contributes to the identification and effective management of risk</u>
	Managing performance	Managing performance	<u>Promote improved performance</u>
	Project management	Project management	<u>Understand and undertake project management</u>
	Managing change	Managing change	<u>Understand change management principles and lead change</u>
	Strategic planning	Strategic planning	<u>Understand strategic context and contribute to strategic planning</u>
	Working across boundaries	Working across boundaries	<u>Work across boundaries</u>
Education, Training and Professional Development	Role model & mentorship	Role model Mentorship	<u>Serve as role model and mentor to others</u>
	Education and training	Conducting education and training	<u>Conduct education and training</u>
	Professional development	Professional development	<u>Contribute to professional development</u>
	Link practice and education	Links practice and education	<u>Links practice and education</u>
	Educational policy	Educational policy	<u>Educational policy</u>
Critical Analysis, Evaluation and Research	Critical evaluation	Critical evaluation	<u>Undertake critical evaluation activities</u>
	Identity gaps in evidence base	Identity gaps in evidence base	<u>Identifies gaps in evidence base</u>
	Develops and evaluates research protocols	Develops and evaluates research protocols	<u>Design and deliver research projects to address gaps in the evidence</u>
	Creates Evidence	Creates evidence	
	Research evidence into working practice	Research evidence into working practice	<u>Apply research evidence into working practice</u>
	Supervises others undertaking research	Supervises others undertaking research	<u>Supervises others undertaking research</u>
Establishes research partnerships	Establishes research partnerships	<u>Establish research partnerships</u>	

### 4.3.2 Content analysis results

Thirty-four competencies in the RPS-APF and 30 in the APPF were identified and extracted at this stage of the content analysis. Competency labels that were identified to be semantically similar were matched. This means that a competency from one framework (and its corresponding behavioural descriptor) was cross-matched with a semantically similar competency from the other framework as shown in Table 4.3.

In total, 123 behavioural descriptors defined across three levels of advanced practice were extracted from the RPS-APF, while 114 corresponding descriptors were extracted from the APPF. The behavioural descriptors under a particular competency in the RPS-APF were cross-matched with the behavioural descriptors of a similar competency in the APPF. The paired behaviours formed a 'behavioural adjacency'. This cross matching produced 114 behavioural adjacencies each containing a pair of behavioural descriptors identified to be related semantically.

A matrix of the competencies and corresponding behavioural adjacencies created from this mapping process is presented in Tables 4.4 to 4.33. Items obtained from the APPF are presented in **blue** font while those from the RPS-APF are shown in black font in these tables. Observed semantic differences in the competency labels and behavioural descriptors are underlined on these tables.

**Table 4.4: Analysis of the documents regarding 'expert skills'**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<b>Advanced Stage 1 <u>(Transition Level)</u></b>	<b>Advanced Stage 2 <u>(Consolidation Level)</u></b>	<b>Mastery <u>(Advanced Level)</u></b>
<i>Expert skills and knowledge (UK)</i>	Demonstrates general pharmaceutical skills and knowledge in core areas	Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s)	Advances the knowledge base in defined area(s)
	<u>In addition for patient focused roles:</u> Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas	<u>In addition for patient focused roles:</u> Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s)	In addition for patient focused roles: Advances in-depth/complex pharmaceutical care programmes for patients
<u>Acquire expert skills and knowledge (AU)</u>	Demonstrates general clinical knowledge in core <u>practice</u> areas	Demonstrates <u>comprehensive, high level clinical</u> knowledge in defined <u>practice</u> area(s)	<u>Advances knowledge in defined practice area(s)</u>
	<u>Able to plan, manage, monitor, advise and review patient care in core practice areas</u>	<u>Able to plan, manage, monitor advise and review patient care programs in defined practice area(s)</u>	<u>Advances patient care programs in defined practice area(s)</u>



**Table 4.5: Analysis of the documents regarding 'delivery of professional expertise'**

Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined.

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<u>Advanced Stage 1 (Transition Level)</u>	<u>Advanced Stage 2 (Consolidation Level)</u>	<u>Mastery (Advanced Level)</u>
<i>Delivery of professional expertise (UK)</i>	Demonstrates accountability for delivering professional expertise and direct service provision as an individual	Demonstrates accountability for the delivery of professional services and expertise via a team or directly to groups of patients/clients/users	Demonstrates accountability for the delivery of professional expertise at a defined higher level. May include providing expertise and service delivery nationally or at a strategic level
<u>Deliver accountable and flexible patient care (AU)</u>	<u>Accepts accountability for patient care services delivered directly to individual patient</u>	<u>Accepts accountability for patient care services delivered directly to a defined patient group</u>	<u>Accepts accountability for patient care services delivered in a defined practice area(s)</u>

**Table 4.6: Analysis of the documents regarding 'reasoning and judgment'**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Reasoning and Judgement (UK)</i>	Demonstrates ability to use skills in a range of routine situations requiring analysis or comparison of a range of options	Demonstrates ability to use skills to make decisions in complex situations where there are several factors that require analysis, interpretation and comparison	Demonstrates ability to use skills to manage difficult and dynamic situations
	Recognises priorities when problem-solving and identifies deviations from the normal pattern	Demonstrates an ability to see situations holistically	Demonstrates ability to make decisions in the absence of evidence or data or when there is conflicting evidence or data
<u>Use reasoning and judgment (AU)</u>	<u>Demonstrates ability to compare options or apply analytical skills in a range of routine situations</u>	<u>Demonstrates ability to make decisions in complex situation where several factors require analysis, interpretation and comparison</u>	<u>Demonstrates ability to apply expertise to assess complex and dynamic situations</u>
	<u>Demonstrates ability to recognise priorities when problem solving and identify deviations from the normal pattern</u>	<u>Demonstrates ability to interpret and synthesise available evidence and/or data to assess clinical situations and therapeutic option</u>	<u>Demonstrates ability to assess clinical situations and therapeutic options in the absence of evidence or data or where there is conflicting evidence or data</u>

**Table 4.7: Analysis of the documents regarding ‘professional autonomy’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<b>Advanced Stage 1 <u>(Transition Level)</u></b>	<b>Advanced Stage 2 <u>(Consolidation Level)</u></b>	<b>Mastery <u>(Advanced Level)</u></b>
<i>Professional autonomy (UK)</i>	Is able to follow legal, ethical, professional and organisational policies/procedures and codes of conduct.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary	Is able to interpret relevant policy and strategy, in order to establish goals and standards for others within the defined area(s)
<u>Use professional autonomy (AU)</u>	<u>Demonstrate ability</u> to follow legal, ethical, professional and organisational policies/procedures and codes of conduct	<u>Demonstrates ability</u> to act according to personal interpretation of broad professional policies/procedures where necessary	Demonstrates ability to <u>interpret government health care policy and strategy to establish policies/procedures, codes and/or</u> standards for others within defined practice area

**Table 4.8: Analysis of the documents regarding ‘communication’**

Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined.

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Communication (UK)</i>	Demonstrates use of appropriate communication to gain the co-operation of relevant stakeholders (including patients, senior and peer colleagues, and other professionals where possible)	Demonstrates use of appropriately selected communication skills to gain co-operation of small groups of relevant stakeholders within the organisation	Demonstrates ability to present complex, sensitive or contentious information to large groups relevant stakeholders
	Demonstrates ability to communicate where the content of the discussion is explicitly defined	Demonstrates ability to communicate where the content of the discussion is based on professional opinion	Demonstrates ability to communicate in a hostile, antagonistic or highly emotive atmosphere
<u>Use appropriate communication skills (AU)</u>	Demonstrates use of appropriate communication to gain the co-operation of <u>individual patients, colleagues and other health professionals</u>	Demonstrates use of appropriately selected communication skills to gain co-operation of <u>patients, colleagues, clinicians and/or managers</u>	Demonstrates ability to present complex, sensitive or contentious information to large groups of <u>patients, clinicians and/or managers</u>
	Demonstrates ability to communicate <u>effectively</u> where content of discussion is explicitly defined	Demonstrates ability to communicate <u>effectively</u> where the content of the discussion is based on <u>personal opinion</u>	Demonstrates ability to communicate <u>effectively</u> in a hostile, antagonistic or highly emotive atmosphere

**Table 4.9: Analysis of the documents regarding ‘team work and consultation’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<b>Advanced Stage 1 (<u>Transition Level</u>)</b>	<b>Advanced Stage 2 (<u>Consolidation Level</u>)</b>	<b>Mastery (<u>Advanced Level</u>)</b>
<i>Team work and consultation (UK)</i>	Demonstrates ability to work as a member of a team	Demonstrates ability to work as <u>an acknowledged</u> member of the multidisciplinary team	Works across boundaries to build relationships and share information, plans and resources
	Recognises personal limitations and refers to more appropriate colleague(s) when <u>necessary</u>	Consulted with the organisation for advice which requires in-depth professional expertise	Sought as an opinion leader both within the organisation and in the external environment
<i><u>Engage in teamwork and consultation (AU)</u></i>	Demonstrates ability to work as a member of the <u>pharmacy</u> team	Demonstrates ability to work as a member of a multidisciplinary team	Works across <u>workplace</u> boundaries to build relationships and share information, plans and resources
	Recognises personal limitations and <u>demonstrates ability</u> to refer to more experienced colleagues	<u>Accepts expert advice through consultation within the workplace/organisation</u>	<u>Provides expert advice within and beyond the workplace/organisation as a recognised opinion leader</u>

**Table 4.10: Analysis of the documents regarding ‘strategic context’ and ‘strategic planning’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Strategic context AND strategic planning (UK)</i>	Demonstrates understanding of the needs of stakeholders. Practice reflects relevant local and national policy	Demonstrates ability to incorporate relevant national policy to influence local strategy	Demonstrates active participation in creating relevant national policies
	Demonstrates ability to think 4-12 months ahead within a defined area. Plans the work programme to align with strategy	Demonstrates ability to <u>think</u> over a year ahead within a defined area	Thinks long term and sector wide. Takes the long- term perspective
<u>Understand strategic context and contribute to strategic planning (AU)</u>	Demonstrates understanding of the needs of stakeholders <u>and</u> practice reflects <u>government health care policy</u>	Demonstrates ability to incorporate <u>government health care policy or priorities</u> to influence local strategy	<u>Participates in development of government health care policy/ strategy or priorities and leads its integration into local strategy</u>
	Demonstrated ability to <u>plan up to 12 months</u> ahead and <u>in alignment with established strategy</u>	Demonstrated ability to <u>plan</u> more than one year ahead taking account of strategic plan	<u>Demonstrated ability to develop a long-term plan taking a holistic view of the practice environment.</u>

The competency ‘strategic context’ is from the leadership domain in the APPF while ‘strategic planning’ is from the management domain in the RPS-APF.

**Table 4.11: Analysis of the documents regarding ‘governance’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Governance (UK)</i>	Demonstrates understanding of the pharmacy role in governance. Implements this appropriately within the workplace	Influences the governance agenda for the team <u>and/or service</u>	Shapes and contributes to the governance agenda at a higher level
<u>Understand and contribute to clinical governance (AU)</u>	Demonstrates understanding of the <u>pharmacist’s role in clinical governance</u> and <u>practice reflects the workplace framework</u>	Influences the clinical governance agenda for the team	Shapes and contributes to the clinical governance agenda of the <u>workplace/organisation</u>

**Table 4.12: Analysis of the documents regarding ‘vision’**

Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined.

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Vision (UK)</i>	Demonstrates understanding of, and contributes to, the <u>workplace</u> vision	Creates vision of future and translates this into clear directions for others	Convinces others to share the vision at a higher level
<u>Understand and contribute to the strategic vision (AU)</u>	Demonstrates understanding of, and contributes to, the vision <u>for professional services</u>	Creates <u>the vision for professional services</u> and translates it <u>into clear goals for the pharmacy team</u>	<u>Influences groups of colleagues, clinicians and/or managers to share the vision for professional services</u>



**Table 4.13: Analysis of the documents regarding ‘innovation’ and ‘service development’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined)

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<u>Advanced Stage 1 (Transition Level)</u>	<u>Advanced Stage 2 (Consolidation Level)</u>	<u>Mastery (Advanced Level)</u>
<i>Innovation and Service Development (UK)</i>	Demonstrates ability to improve quality within limitations of service	Recognises and implements innovation from the external environment	Takes the lead to ensure innovation produces demonstrable improvement
	Reviews last year’s progress and develop clear plans to achieve results within priorities set by others	Develops clear understanding of priorities and formulates practical short-term plans in line with workplace strategy	Relates goals and actions to strategic aims of organisation and profession
<u>Contribute innovation and service development (AU)</u>	Demonstrates ability to improve the quality or <u>range of services with limited supervision.</u>	Recognises and implements innovation from the external environment <u>without supervision</u>	<u>Leads efforts</u> to ensure innovation produces demonstrable improvement in <u>service delivery</u>
	<u>Applies priorities set by others to develop clear plans for services based on review of recent past performance</u>	<u>Develops future plans for professional services based on a clear understanding of priorities.</u>	Relates goals and actions to strategic aims of <u>the workplace or profession</u>

**Table 4.14: Analysis of the documents regarding ‘motivation’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Motivational (UK)</i>	Demonstrates ability to motivate self to achieve goals	Demonstrates ability to motivate individuals and/or the team	Demonstrates ability to motivate individuals and/or teams at a higher level. <u>May include more strategic motivational activities at local, institutional and national levels</u>
<u>Motivates self and others (AU)</u>	Demonstrates ability to <u>self-motivate</u> to achieve goals	Demonstrates ability to motivate individuals <u>in the team</u> .	Demonstrated ability to motivate individuals <u>beyond the team</u>

**Table 4.15: Analysis of the documents regarding ‘implementing national priorities’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Implementing national priorities (UK)</i>	Demonstrates understanding of the implications of national priorities for the team <u>and/or</u> service	Shapes the response of the team <u>and/or service</u> to national priorities	Accountable for the direct delivery of national priorities at a higher level
<u>Support and assist implementation of national priorities (AU)</u>	Demonstrates understanding of the implications of national <u>health care</u> priorities for the team	<u>Influences</u> the response of the team to national <u>health care</u> priorities	<u>Leads response of the team to national health care priorities</u>

**Table 4.16: Analysis of the documents regarding ‘resource utilisation’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Resource utilisation (UK)</i>	Demonstrates understanding of the process for effective resource utilisation	Demonstrates ability to effectively manage resources	Demonstrates ability to reconfigure the use of available resources
<u><i>Understands and contributes to the effective use of resources (AU)</i></u>	Demonstrates understanding of the process for effective resource utilisation	Demonstrates <u>effective management</u> of resources	<u>Demonstrates ability to assess and reassign resources to improve effectiveness of use</u>

**Table 4.17: Analysis of the documents regarding ‘standards of practice’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Standards of practice (UK)</i>	Demonstrates understanding of, and conforms to, relevant standards of practice	Demonstrates ability to set and monitor standards of practice at team and/or service level	Accountable for the setting and monitoring of standards at a higher level
<i>Applies and monitors standards of practice (AU)</i>	Demonstrates understanding of, and conforms to relevant standards of practice	<u>Accountable for setting and monitoring standards of practice beyond the team</u>	Accountable for setting and monitoring standards of practice at the <u>team level</u>

**Table 4.18: Analysis of the documents regarding ‘managing risk’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b><i>Managing Risk (UK)</i></b>	Demonstrates ability to identify and resolve risk management issues according to policy/protocol	Develops risk management policies/protocols for the team and/or service, including identifying and resolving new risk management issues	Is accountable for developing risk management policies/procedures at a higher level, including identifying and resolving new risk management issues
<u><i>Contributes to the identification and effective management of risk (AU)</i></u>	Demonstrates ability to identify and resolve risk management issues <u>using established</u> policy/procedure	<u>Is accountable for developing risk policy/procedure for managing existing and newly identified</u>	<u>Is accountable for developing policy/ procedure for managing existing and newly identified risks beyond the team.</u>

**Table 4.19: Analysis of the documents regarding ‘managing performance’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font* with the semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Managing Performance (UK)</i>	Follows professional and organisational policies/procedures relating to performance management	Is accountable for performance management for a team <u>or group of personnel</u>	Is accountable for performance management at a <u>higher and/or institutional level</u>
<u>Promote Improved performance (AU)</u>	<u>Contributes to performance management processes in accordance with established policy/procedure. Refers appropriately to colleagues for guidance as require</u>	Is accountable for performance management of team <u>members</u>	Is accountable for performance management of <u>the team as a whole</u>

**Table 4.20: Analysis of the documents regarding ‘project management’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<b>Advanced Stage 1 (<u>Transition Level</u>)</b>	<b>Advanced Stage 2 (<u>Consolidation Level</u>)</b>	<b>Mastery (<u>Advanced Level</u>)</b>
<b><i>Project management (UK)</i></b>	Demonstrates understanding of the principles of project management	Demonstrates ability to successfully manage a project at team <u>and/or service level</u>	Demonstrates ability to successfully manage a project at a higher level
<b><u>Understand and undertake project management (AU)</u></b>	Demonstrates understanding of the principles of project management <u>and manages simple projects. Refers appropriately to colleagues for guidance as required</u>	Demonstrates ability to successfully manage a project at <u>team level</u>	Demonstrates ability <u>to plan and supervise the implementation of a project</u>



**Table 4.21: Analysis of the documents regarding ‘managing change’**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Managing Change (UK)</i>	Demonstrates understanding of the principles of change management	Demonstrates ability to manage a process of change for the team <u>and/or service</u>	Demonstrates ability to manage a process of change at a higher level
<u>Understand change management principles and lead change (AU)</u>	Demonstrates understanding of the principles of change management	Demonstrates ability to manage a process of change for the team	<u>Demonstrates ability to lead a change process beyond the team/workplace or across disciplines</u>

**Table 4.22: Analysis of the documents regarding ‘working across boundaries’**

*(Items from the APPF are shown in blue font while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).*

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b>Working across boundaries (UK)</b>	Demonstrates ability to extend boundaries of service delivery within the team	Demonstrates ability to extend the boundaries of the service across more than one team	Demonstrates the value of extending service delivery across boundaries in the external environment
<b>Work across boundaries (AU)</b>	Demonstrates ability to extend boundaries of service delivery within the <u>pharmacy</u> team	Demonstrates ability to extend the boundaries of the service across more than one team	Demonstrates the value of extending <u>the boundaries of service delivery across professions and/or external environment</u>

**Table 4.23: Analysis of the documents regarding ‘role model’ and ‘mentorship’.**

*(Items from the APPF are shown in blue font while those from the RPS-APPF are in black font. The semantic differences in the description of the items are underlined).*

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b>Role model AND mentorship (UK)</b>	Understands and demonstrates the characteristics of a role model to members in the team <u>and/or service</u>	Demonstrates the characteristics of an effective role model <u>at a higher level</u>	Is able to develop effective role model behaviour in others
	Demonstrates understanding of the mentorship process	Demonstrates ability to effectively mentor others within the team <u>and/or service</u>	Demonstrates ability to effectively mentor outside the team <u>and/or service</u>
<u>Serves as role model and mentor to others (AU)</u>	Understands and demonstrates the characteristics of a role model to members of the team	Demonstrates the characteristics of an effective role model within <u>and beyond</u> the team	<u>Demonstrates ability to engender</u> role model behaviour in others.
	Demonstrates understanding of the mentorship process	Demonstrates ability to effectively mentor others within the team	Demonstrates ability to effectively mentor outside the team

**Table 4.24: Analysis of the documents regarding ‘conducting education and training’.**

*(Items from the APPF are shown in blue font while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).*

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b>Conducting education and training (UK)</b>	Demonstrates ability to conduct teaching and <u>assessment effectively</u> according to a <u>learning</u> plan with <u>supervision</u> from a more experienced colleague	<u>Demonstrate ability</u> to assess the performance and learning needs of others. Demonstrates ability to plan a series of effective learning experiences for others	Demonstrates ability to design and manage a course of study, with appropriate use of teaching, assessment and study methods
<b>Conduct education and training (AU)</b>	Demonstrates ability to conduct teaching <u>efficiently</u> according to an <u>agreed</u> plan with <u>guidance</u> from a more experienced colleague	<u>Able</u> to assess the performance and learning needs of others. Demonstrates ability to plan a series of effective learning experience for others	Demonstrates ability to design and manage a course of study, with appropriate use of teaching, assessment and study methods

**Table 4.25: Analysis of the documents regarding ‘professional development’.**

*(Items from the APPF are shown in blue font while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).*

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b>Professional development (UK)</b>	Demonstrates self-development through continuous professional development activity	Facilitates the professional development of others	Shapes and contributes to the professional development strategy
<u>Contribute to professional development (AU)</u>	Demonstrates self-development through <u>regular CPD and the application of learning to practice</u>	<u>Acts as a CPD facilitator for the profession.</u>	Shapes and contributes <u>to the CPD strategy for the profession or other disciplines.</u>

**Table 4.26: Analysis of the documents regarding ‘links practice and education’.**

*(Items from the APPF are shown in blue font while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).*

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<b>Links practice and education (UK)</b>	Participates in the delivery of formal education programmes	Participates in the education and training in an external environment	Shapes, contributes to or is accountable for the creation or development of higher education qualification(s)
<b>Links practice and education (AU)</b>	Participates in the formal education of <u>undergraduate and postgraduate students</u>	Participates in the education and training of <u>formal special interest groups in the external environment</u>	Shapes, contributes to or is accountable for the creation or development of higher education qualification(s)

**Table 4.27: Analysis of the documents regarding ‘educational policy’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Educational Policy (UK) †</i>	Demonstrates an understanding of current educational policies relevant to working areas of practice	Demonstrates ability to interpret national policy in order to design strategic approaches for local workforce education <u>planning and development</u>	Shapes and contributes to national educational policy
<i>Educational policy/Conduct Education and Training (AU)</i>	Demonstrates an understanding of current educational policies <u>in health services</u>	Demonstrates ability to interpret national policy in order to design strategic approaches to local workforce education	Shapes and contributes to national <u>education and workforce planning and development policy</u>

**Table 4.28: Analysis of the documents regarding ‘critical evaluation’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Critical evaluation (UK)</i>	Demonstrates ability to critically evaluate <u>and review</u> literature	Demonstrates application of critical evaluation skills in the context of <u>working</u> practice	<u>Is</u> recognised as undertaking peer review activities <u>within working</u> practice
<u>Undertake critical evaluation activities (AU)</u>	Demonstrated ability to critically evaluate literature <u>sources</u>	Demonstrated application of critical evaluation skills in the context of practice	Recognised as undertaking peer review activities in practice



**Table 4.29: Analysis of the documents regarding ‘identifies gaps in the evidence’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Identifies gaps in <u>the</u> evidence base (UK)</i>	Demonstrates ability to identify <u>where there is a</u> gap in the evidence base to <u>support</u> practice	Demonstrates ability to formulate appropriate and rigorous research questions	Demonstrates ability to design a <u>successful</u> strategy to address research questions
<i>Identifies gaps in evidence base (AU)</i>	Demonstrates ability to identify gaps in the evidence base <u>for</u> practice	Demonstrates ability to formulate appropriate and rigorous research questions <u>to address evidence gaps</u>	Demonstrates ability to design an <u>appropriate research</u> strategy to address research question.

**Table 4.30: Analysis of the documents regarding ‘develops and evaluates research policies’ and ‘creates evidence’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<b>Advanced Stage 1 (<u>Transition Level</u>)</b>	<b>Advanced Stage 2 (<u>Consolidation Level</u>)</b>	<b>Mastery (<u>Advanced Level</u>)</b>
<i><b>Develops and evaluates research protocols AND Creates evidence (UK)</b></i>	Demonstrates ability to describe the core features of research protocols	Demonstrates ability to design a <u>rigorous</u> protocol to address previously formulated research questions	Demonstrates active involvement in the critical review of research protocols
	Demonstrates ability to generate evidence suitable for presentation at local level	<u>Demonstrates ability to</u> generate new evidence suitable for presentation at research symposia	Demonstrates authorship of primary evidence <u>and</u> outcomes in peer-reviewed media
<i><u>Design and deliver research projects to address gaps in the evidence base (AU)</u></i>	Demonstrates ability to describe the core features of research protocols	Demonstrates ability to design a <u>research</u> protocol to address previously formulated research questions	Demonstrates active involvement in the critical review of research protocols
	Demonstrates ability to generate evidence suitable for presentation at local level	Generates new evidence suitable for presentation at research <u>symposium</u>	Demonstrates authorship of primary evidence outcomes in peer-reviewed media.

**Table 4.31: Analysis of the documents regarding ‘research evidence into working practice’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i>Research evidence into working practice (UK)</i>	Demonstrates ability to apply the research evidence base into working practice	Demonstrates ability to apply research and evidence-based practice within the team <u>and/or service</u>	Is able to use research evidence to shape policy/procedure at an organisational and/or national level
<i>Apply research evidence into working practice (AU)</i>	Demonstrates ability to apply research into <u>own</u> practice	Demonstrates ability to apply evidence-based practice within the team	<u>Is able to use research evidence to shape workplace/organisational policy/procedure</u>

**Table 4.32: Analysis of the documents regarding ‘supervises others undertaking research’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	<u>Advanced Stage 1 (Transition Level)</u>	<u>Advanced Stage 2 (Consolidation Level)</u>	<u>Mastery (Advanced Level)</u>
<i>Supervises others undertaking research (UK)</i>	Demonstrates understanding of the principles of research governance	Demonstrates understanding of the principles of research governance	Is a research project supervisor for postgraduate students
<i>Supervises others undertaking research (AU)</i>	Demonstrates understanding of the principles of research governance.	Demonstrates understanding of the principles of research governance.	Is a research project supervisor for postgraduate students

**Table 4.33: Analysis of the documents regarding ‘establishes research partnerships’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

COMPETENCY	DEVELOPMENTAL DESCRIPTORS		
	Advanced Stage 1 <u>(Transition Level)</u>	Advanced Stage 2 <u>(Consolidation Level)</u>	Mastery <u>(Advanced Level)</u>
<i><b><u>Establishes</u> Research Partnerships (UK)</b></i>	Demonstrates ability to work as a member of <u>the</u> research team	Demonstrates ability to establish new multidisciplinary links to conduct research project	Demonstrates ability to show leadership within research teams concerning the conduct of <u>specialist</u> research
<i><b>Establish Research Partnerships (AU)</b></i>	Demonstrates ability to work as a member of <u>a</u> research team	Demonstrates ability to establish new multidisciplinary links to conduct research project	Demonstrates ability to show leadership within research teams concerning the conduct of research

### 4.3.3 Summary of content analysis results

The competencies and behavioral descriptors in the frameworks were presented in relation to the cluster headings and three distinct levels of advanced practice in the two frameworks. In total, six cluster themes and 30 competency sub-themes were developed from the content analysis.

Sixty-four competencies and 237 behavioural descriptors were identified and extracted from both frameworks under the subthemes. Thirty-four competencies and 123 behavioural descriptors were extracted from the RPS-APF while 30 competencies and 114 descriptors were obtained from the APPF.

The analysis showed that eight of the RPS-APF competencies were condensed into four corresponding competencies in the APPF. These competencies were the:

- 'strategic context' and 'strategic planning' competencies in the RPS-APF, which were merged into '[understand strategic context and contribute to strategic planning](#)' in the APPF;
- 'innovation' and 'service development' competencies in the RPS-APF were condensed into '[contribute to innovation and service development](#)' in the APPF;
- 'role model' and 'mentorship' competencies in the RPS-APF were condensed into '[serve as role model and mentor to others](#)'; and
- 'develops and evaluates research protocol' and 'creates evidence' competencies in the RPS-APF were condensed into '[design and deliver research projects to address gaps in the evidence](#)' in the APPF.

The content analysis also identified semantic difference between the frameworks. These differences were in three of the cluster headings (Table 4.1), the three levels of practice labels (Table 4.2), 25 of the competency labels (Table 4.3), and in 103 of the behavioural descriptors (Tables 4.4 to 4.33) obtain from the two frameworks.

Generally, the competencies labels in the APPF were more descriptive and action-oriented than those in the RPS-APF. Semantic differences in description of behaviours were observed in most of the behavioural adjacencies formed in the content analysis with 11 containing behaviours that were described using the same words. The adjacencies with similar behaviours were formed under the:

- Advance stage 1 ([transition level](#)) descriptors of five competencies including: 'resources utilisation' & '[contribute to effective use of resources](#)'; 'standards or practice' & '[monitor standards of practice](#)'; 'managing change' & '[understand change management](#)'; 'develops and evaluates research protocol' & '[design/deliver research projects to address gaps](#)'; and 'supervise others undertaking research' & '[supervise others undertaking research](#)', competencies in the RPS-APF and APPF respectively.
- Advance stage 2 ([consolidation level](#)) descriptors of three competencies: 'working across boundaries' & '[working across boundaries](#)'; 'supervise others undertaking research' & '[supervise others undertaking research](#)'; and 'establish research partnerships' & '[establish research partnerships](#)', competencies in the RPS-APF and APPF respectively.
- Mastery (Advance level) descriptors in three competencies: 'conduct education and training' and '[conduct education and training](#)'; 'link practice and education' and '[link practice and education](#)'; and 'supervise others undertaking research' and '[supervise others undertaking research](#)', competencies in the RPS-APF and APPF respectively.

The results of the content analysis were collated and presented to an expert panel for further review and consensus development. The outcome of the review is reported in the following session (stage 3 of this study).

#### **4.4 Stage 3 | Expert Review and Consensus Development**

The content analysis results as shown in Tables 4.4 to 4.33 were collated and presented to a panel of experts for further review and consensus development. The objectives of the panel review was to obtain expert opinion and develop consensus on the:

- Outcome of the content analysis shown in Table 4.4 to 4.33 in terms of its semantic accuracy
- Similarity or dissimilarity between the behaviours in each of the behavioural adjacencies formed in the content analysis.

##### **4.4.1 Methodology**

A convenience sample of expert pharmacy practitioners was used in this study. These experts were identified via consultation with national pharmacy organisations and professional bodies who have already developed (or were in the process of developing) a competency framework in their countries. These countries were United Kingdom, Australia, Singapore, Serbia, Croatia, Ireland and USA. Experts involved in the development of such frameworks or practice standards in these countries and those previously involved with the development of the FIP global competency framework were invited. Five other experts who had been involved in professional development and training of advanced practitioners in UK, Nigeria, Ghana and Malta were identified by FIPED and invited to participate in the panel.

In total, twenty-five experts were invited and 14 consented to participate in the panel. This represented a response rate of 56%. Twelve of these experts provided inputs through a face-to-face panel meeting while two other members of the panel provided inputs via an online software called Qualtrics®. Qualtrics® is an online survey software with built in platform for creating, publishing and hosting online surveys. The software also contains a feature that allows for the dissemination of survey links for anonymous completion. Responses to the survey are accessed in real time and can be analysed on the platform or exported to other statistical analysis software packages like SPSS.

The expert panel was convened on 5<sup>th</sup> of September 2013 at the FIP International Conference of Pharmacists and Pharmaceutical Scientists that held in Dublin, Ireland. This means,



experts who did not plan to attend the conference were unable to participate in the face-to-face panel meeting. The panel meeting lasted for two hours. The panel members worked in pairs with each reviewing one cluster in the first round. This means that the six pairs of experts each reviewed the competencies and behavioral adjacencies under one of the six competency themes in the first round.

The experts were required to indicate whether a behavioural adjacency formed under a competency contained similar or dissimilar behaviours. This means the experts assessed each behavioural adjacency in their allocated cluster to judge whether the semantic differences observed meant the two behavioural descriptors contained therein were similar or dissimilar.

A 'Yes' vote indicated they were similar while a 'No' vote indicated dissimilarity. The result of the first round was collated with the clusters switched between the pairs for a second round of consensus building. This was repeated a third time and the overall outcome of the review including the comments were collated and fed back to the group. This included the inputs obtained from the two experts who completed the exercise using the Qualtrics® software. Each round lasted for twenty minutes and final consensus was obtained when the entire group reached unanimous decision on similarity or dissimilarity between the descriptors in a particular behavioural adjacency.

## **4.4.2 Results**

### **4.4.2.1 Demography**

The expert panel comprised:

- 6 experts in clinical/hospital pharmacy
- 5 experts in academic pharmacy
- 2 experts in regulatory pharmacy, and
- 1 expert in Administrative pharmacy

Nine countries were represented in the panel and these were from four of the six WHO regions. These included Europe (Malta, UK, Ireland and Croatia), Africa (Nigeria), the Americas (USA), and Western Pacific (Australia, Singapore, Japan) regions. The mean length practice of the panel members was 26years [SD:  $\pm 10$ years; min.- max: 8-37years].

The competencies and behavioural adjacencies formed in the content analysis (Table 4.4 to 4.33) were presented to the panel. Consensus on similarity or dissimilarity between the behavioural descriptors in each of the 114 behavioural adjacencies is presented in Table 4.34 to 4.44.

#### 4.4.2.2 Similarity and dissimilarity between contents of two advanced pharmacy frameworks

##### A) Expertise and Expert skills theme

**Table 4.34: Similarities and differences between behaviours derived from the competencies under the theme ‘Expertise and Expert skills’.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

Competency	Behavioural adjacencies (n)		Row Total
	With Similar behaviours	With Dissimilar behaviours	
Expert skills and knowledge   <u>acquire expert skills and knowledge</u>	2	4	6
Delivery of professional expertise   <u>deliver accountable and flexible patient care</u>	-	3	3
Reasoning and judgment   <u>use reasoning and judgement</u>	6	-	6
Professional autonomy   <u>use professional autonomy</u>	3	-	3
<b>Column Total (%)</b>	11 (61)	7 (39)	18

Based on consensus, 11 (61%) of the 18 behavioural adjacencies created from the competencies in this theme, each contained similar behaviours while 7 (39%) of those adjacencies contained behaviours that were dissimilar.

The behaviours in the adjacencies found to be dissimilar are shown below alongside the comments made by the expert panel. (Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*).

- Four of the six adjacencies created under the competencies ‘**expert skills and knowledge**’ and ‘**acquire expert skills and knowledge**’ derived from the RPS-APF and APPF respectively contained behaviours that were not similar.

The dissimilar behaviours were:

“Demonstrates general pharmaceutical skills and knowledge in core areas” **AND**  
 “Demonstrates general clinical knowledge in core areas”

**Expert comment:** *‘The first statement refers to knowledge and skills, second to knowledge only. Also first refers to pharmaceutical knowledge, which is much broader than clinical knowledge’.*

“Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s)” **AND**  
 “Demonstrates comprehensive, high level clinical knowledge in defined practice area(s)”

**Expert comment:** *‘The first statement refers to knowledge and skills while the second refers to knowledge only. Could also argue that ‘in-depth’ and ‘comprehensive’ are not the same, as comprehensive could mean broad rather than deep knowledge’*

“In addition for patient focused roles: Advances in-depth/complex pharmaceutical care programmes for patients” **AND** Advances patient care programs in defined practice area(s)

**Expert comment:** *‘Loss of distinction that complex issues are being dealt with and loss of pharmaceutical care in the second statement makes this different from the first’.*

“Demonstrates accountability for the delivery of professional expertise at a defined higher level. May include providing expertise and service delivery nationally or at a strategic level” **AND** “Accepts accountability for patient care services delivered in a defined practice area(s)”

**Expert comment:** *‘The two statements define practice at different levels’*

- Based on consensus, the three behavioural adjacencies created under the competencies ‘**Delivery of professional expertise**’ and ‘**Deliver accountable and flexible patient care**’ derived from the RPS-APF and APPF respectively, contained behaviours that were not similar.

The three adjacencies with dissimilar behaviours were:

“Demonstrates accountability for delivering professional expertise and direct service provision as an individual” AND “Accepts accountability for patient care services delivered directly to individual patient”

**Expert comment:** *‘The two statements are dissimilar; the second statement is also too broad as patient care services could mean anything’*

“Demonstrates accountability for the delivery of professional services and expertise via a team or directly to groups of patients/clients/users” AND “Accepts accountability for patient care services delivered directly to a defined patient group”

**Expert comment:** *‘The two behaviours are dissimilar. Demonstrating accountability is different from accepting accountability, as it is possible to accept accountability without necessarily demonstrating it’*

“Demonstrates accountability for the delivery of professional expertise at a defined higher level. May include providing expertise and service delivery nationally or at a strategic level” AND “Accepts accountability for patient care services delivered in a defined practice area(s)”

**Expert comment:** *‘The two statements define practice at different levels’*

- There was consensus agreement that the behaviours in the six behavioural adjacencies created under the ‘reasoning and judgment’ and ‘**use reasoning and judgement**’ competencies derived from the RPS-APF and APPF respectively were similar. There was also agreement that the behaviours in the three behavioural adjacencies created under the ‘professional autonomy’ and ‘**use professional autonomy**’ competencies derived from the RPS-APF and APPF respectively, were similar.

## B) Collaborative Practice theme

**Table 4.35: Similarities and differences between behaviours derived from the competencies under the theme ‘Collaborative Practice’ theme.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

Competency	Behavioural adjacencies (n)		Row total
	With Similar behaviours	With Dissimilar behaviours	
Communication   <u>use appropriate communication skills</u>	6	-	6
Team work   <u>engage in team work and consultation</u>	6	-	6
<b>Column Total (%)</b>	12 (100)	-	12

Under the ‘**Collaborative practice**’ theme, there was consensus that all the behaviours that made up the six behavioural adjacencies created under the ‘communication’ and ‘use appropriate communication skills’ competencies derived from the RPS-APF and APPF respectively were all similar.

Also, there was agreement that all the behaviours that made up the six behavioural adjacencies created under the ‘team work’ competency in the RPS-APF and ‘engage in team work and consultation’ competency in the APPF were similar.

### C) Leadership theme

**Table 4.36: Similarities and differences between behaviours derived from the competencies under the ‘Leadership’ theme.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).

Competency	Behavioural adjacencies (n)		Row total
	With Similar behaviours	With Dissimilar behaviours	
Strategic context and Strategic planning   <u>Understand</u> strategic context and <u>contribute to strategic planning</u>	6	-	6
Governance   <u>understand and contribute to clinical governance</u>	3	-	3
Vision   <u>understand and contribute to the strategic vision</u>	3	-	3
Innovation and service development   <u>Contribute to</u> innovation and service development	6	-	6
Motivational   <u>motivates self and others</u>	3	-	3
<b>Column Total (%)</b>	21 (100)	-	21

Although semantic differences were identified in the description of the behaviours under the five (5) competencies in this theme, it was agreed by consensus, that the twenty-one (21) behavioural adjacencies created under these competencies contained behaviours that were all similar.

#### D) Management theme

**Table 4.37: Similarities and differences between behaviours derived from the competencies under the ‘Management’ theme.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

Competency	Behavioural adjacencies (n)		Row Total
	With Similar behaviours	With Dissimilar behaviours	
Implementing national priorities   <u>support and assist the implementation of national priorities</u>	2	1	3
Resource utilisation   <u>understands and contributes to the effective use of resources</u>	3	-	3
Standards of practice   <u>applies and monitors standards of practice</u>	2	1	3
Managing risk   <u>contributes to the identification and effective management of risk</u>	3	-	3
Managing performance   <u>Promote improved performance</u>	2	1	3
Project management   <u>understand and undertake project management</u>	2	1	3
Managing change   <u>understand change management principles and lead change</u>	3	-	3
Working across boundaries   <u>working across boundaries</u>	3	-	3
<b>Column Total (%)</b>	20 (83.3)	4 (16.7)	24



Twenty-four behavioural adjacencies were created under the competencies in the 'Management' theme. There was consensus that 20 (83.3%) of those adjacencies contain behaviours that were similar while 4 (16.7%) contained behaviours that were not similar.

- One behavioural adjacency created under the competency 'implementing national priorities' and 'support and assist the implementation of national priorities' derived from the RPS-APF and APPF respectively, contained behaviours that were dissimilar. These behaviours were:

“Accountable for the direct delivery of national priorities at a higher level” AND “[Leads response of the team to national health care priorities](#)”

**Expert comment:** *‘the two behaviours are not similar; being accountable for delivery of a service is not the same as leading the response of a team’*

- An adjacency created under the competency 'Standards of practice' and 'applies and monitors standards of practice' derived from the RPS-APF and APPF respectively, contained behaviours that were not similar. These behaviours were:

“Demonstrates ability to set and monitor standards of practice at team and/or service level” AND “[Accountable for setting and monitoring standards of practice beyond the team](#)”

**Expert comment:** *‘The two statements describe behaviours at different levels of practice’.*

- An adjacency created under the competency 'managing performance' 'promote improved performance' derived from the PRS-APF and APPF respectively, contained behaviours that were also not similar. These behaviours were:

“Is accountable for performance management at a higher and/or institutional level” AND “Is accountable for performance management of [the team as a whole](#)”

**Expert comment:** *‘Statement 2 assumes one type of performance management whereas statement 1 is broader and can encompass participation in disciplinary*

*panels and other panels without being accountable for that individual's performance management'.*

- One adjacency created from the 'project management' and 'understand and undertake project management' competencies derived from the RPS-APF and the APPF contained behaviours that were not similar. These behaviours were:

“Demonstrates ability to successfully manage a project at a higher level” **AND**  
“Demonstrates ability to plan and supervise the implementation of a project”

**Expert comment:** *'Statement 1 involves management while statement 2 encompasses both a managerial and leadership role'. The two statements describe different behaviours.*

## E) Education, Training and Professional Development

**Table 4.38: Similarities and differences between behaviours derived from the competencies under ‘Education, Training & Professional Development’ theme.**

(Items from the APPF are shown in *blue font* while those from the RPS-APF are in *black font*. The semantic differences in the description of the items are underlined).

Competency	Behaviours (n)		Row total
	Similar behaviours	Dissimilar behaviours	
Role model and mentorship   <u>serves as role model and mentor to others</u>	6	-	6
Conducting education and training   <u>conduct education and training</u>	3	-	3
Professional development   <u>contribute to professional development</u>	3	-	3
Links practice and education   <u>links practice and education</u>	2	1	3
Educational policy   <u>educational policy</u>	3	-	3
<b>Column Total (%)</b>	17 (94.4)	1 (5.6)	18

Of the 18 behavioural adjacencies created under the five competencies in this theme, there was consensus that the behaviours in 17 (94.4%) adjacencies were similar while the behaviours in one (5.6%) adjacency were not similar. The dissimilar behaviours are shown below alongside the comments made by the expert panel.

The dissimilar behaviours were under the competency ‘links practice and education’ and ‘links practice and education’. The dissimilar behaviours were:

“Participates in the education and training in an external environment” **AND** “Participates in the education and training of formal special interest groups in the external environment”

**Expert comment:** ‘Statement 1 is more generic while statement 2 specifies the specific group to be trained and the two statements are therefore dissimilar.’

#### F) Critical appraisal, Evaluation and Research theme

**Table 4.39: Similarities and differences between behaviours derived from the competencies under the Evaluation & Research’ theme.**

(Items from the APPF are shown in **blue font** while those from the RPS-APF are in black font. The semantic differences in the description of the items are underlined).

Competency	Behavioural Adjacencies (n)		Row total
	Similar behaviours	Dissimilar behaviours	
Critical evaluation   <u>Undertake critical evaluation activities</u>	3	-	3
Identifies gaps in the evidence base   <u>identifies gaps in evidence base</u>	3	-	3
Develops and evaluates protocols/creates evidence   <u>design and deliver research projects to address gaps in the evidence base</u>	6	-	6
Research evidence into working practice   <u>apply research evidence into working practice</u>	3	-	3
Supervises others undertaking research   <u>supervises others undertaking research</u>	3	-	3
Establishes research partnership   <u>establish research partnerships</u>	3	-	3
<b>Column Total (%)</b>	21 (100)	-	21

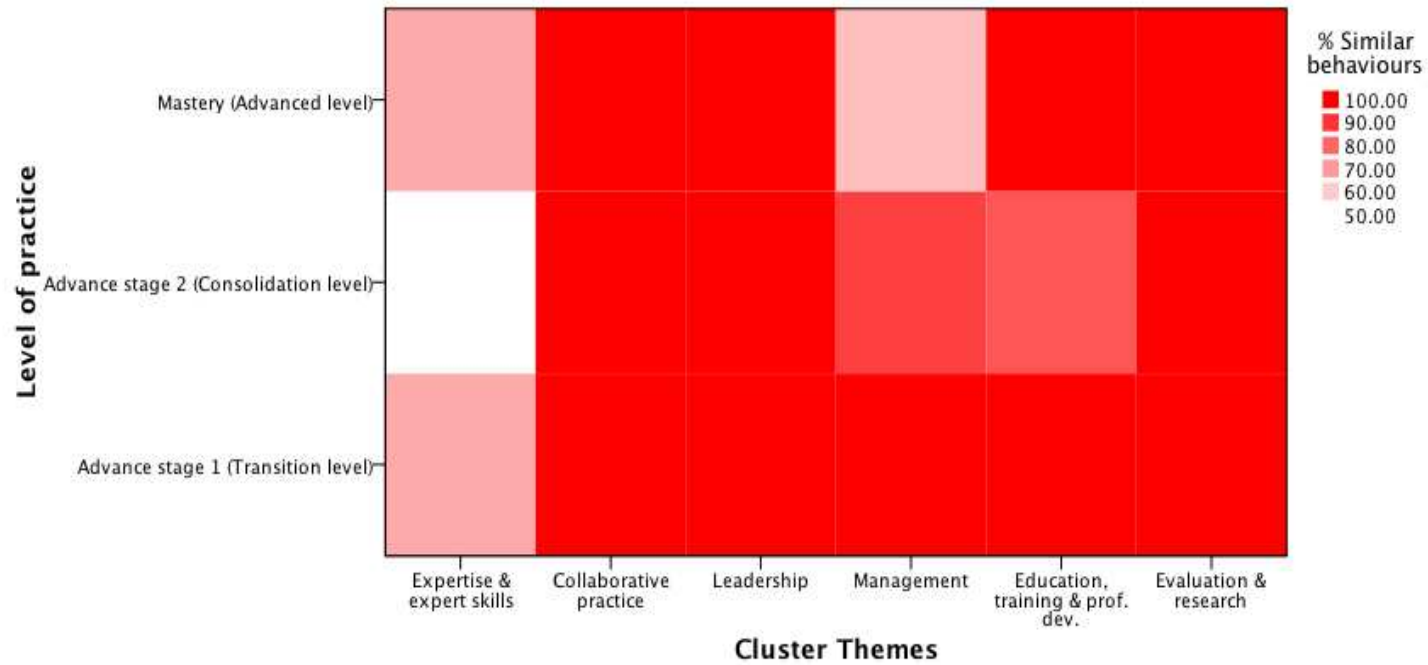
There was consensus that the twenty-one behavioural adjacencies created under the evaluation and research theme all contained behaviours that were similar.

Table 4.40 to 4.44 provides a summary of the overall consensus on similarity between behaviours in the 114 adjacencies created from the two frameworks.

**Table 4.40: Consensus opinion on similarity and dissimilarity between behaviours in the adjacencies per competency theme**

<b>Competency Themes</b>	<b>Behavioural Adjacencies N (%)</b>	
	N similar behaviours	N dissimilar behaviours
Expertise & Expert Skills	11 (61)	7 (39)
Collaboration Practice	12 (100)	0 (0)
Leadership	21 (100)	0 (0)
Management	20 (83)	4 (17)
Education, Training & Professional Development	20 (94)	1 (6)
Evaluation and Research	21 (100)	0 (0)
<b>N Column Total (%)</b>	<b>102 (89.5)</b>	<b>12 (10.5)</b>

**Figure 4.2: Heatmap showing similarity between behaviours in the adjacencies formed per competency theme**



*The heatmap shows the degree of similarity between the adjacencies formed in the six competency themes identified from the two frameworks. The darker regions show a higher percentage of similar behaviours. The expertise and expert skills theme had the least percentage of similar behaviours while the collaborative practice, leadership and evaluation & research themes had the highest percentage of similar behaviours.*

#### ***4.4.2.3 Summary of expert panel review and consensus development results***

Overall, there was consensus that 102 (89.5%) behavioral adjacencies created from the content analysis contained behaviours that were similar. The adjacencies with similar behaviours were formed under three of the six competency themes. These were the 'collaborative practice', 'leadership' and 'evaluation & research' themes.

The twelve adjacencies with dissimilar behaviours were under the 'expertise and expert skills', 'management', and 'education, training & professional development' themes. These were:

- Seven adjacencies under 'expertise and expert skills'. This comprised four adjacencies under the 'expert skills and knowledge' ('[acquire expert skills and knowledge](#)'); and three adjacencies under the 'delivery of professional expertise' ('[deliver of accountable and flexible patient care](#)') competencies, respectively.
- Four adjacencies under 'management', including an adjacency under the 'implementing national priorities' ('[support and assist implementation of national priorities](#)'); 'standard of practice' ('[applies and monitors standards of practice](#)'); 'managing performance' ('[promote improved performance](#)'); and 'project management' ('[understand and undertake project management](#)') competencies, respectively.
- One adjacency from the education, training & professional development created from the 'link practice and education' ('[links practice and education](#)') competency.

The result demonstrates parity between the frameworks with consensus developed that approximately 90% of the behaviours contained in the two frameworks were similar.

## 4.5 Stage 4 | Crossover Mapping Experiment

The goal of this stage was to assess the functional equivalence between the two advanced pharmacy frameworks identified in this study. It aimed to evaluate the outcome of assessment produced by the two frameworks. The objectives were:

- To evaluate the outcome of two self-assessments produced by a group of advanced practitioners from different countries
- To determine whether the outcome of assessment produced by the two frameworks were similar for the same group of individuals.

*[Advanced pharmacy practice is practice that is so significantly different from that achieved at initial registration that it warrants recognition by peers of the expertise of the practitioner and the education, training and experience from which that capability was derived (An Advance Pharmacy Practice Framework for Australia (p.6)].*

### 4.5.1 Methodology

A crossover experiment was used for this study. Study participants in the crossover experiment self-assessed their competence with one framework at a specified time T<sub>1</sub>. After three months, the same group of practitioners carried out a second self-assessment using a different framework.

The study was conducted via email and participants completed the two self-assessments over a six-month period. The experimental document for the first assessment was forwarded to the participants via email between 7<sup>th</sup> to 21<sup>st</sup> February 2014. This was the timeframe within which each participant completed and signed the consent and enrollment forms required for the study. Thereafter, they were given six weeks from the time of receipt to complete and return the first framework. The first assessment period ended on 24 March 2014. The three-month washout period was calculated pro rata based on when participants returned the completed first assessment document. Overall, the second assessment commenced on 26 May 2014 and ended on 4 August 2014.

To be included in the study, the participant had to:

- Have at least five years post-licence experience in pharmacy
- Duly sign and complete the consent and enrolment forms and also agree to carry out the two consecutive self-assessments required.

Exclusion criteria were:



- Practitioners with less than five years post-licence pharmacy practice experience
- Practitioners unable to commit to the two self-assessments required.

Practitioners were also required to meet the general description of one of the three levels of advanced pharmacy practice. That is the: advanced stage 1 (*transition*); advanced stage II (*consolidation*) or Mastery (*advanced level*) [Please see Appendix 9 for detailed description].

#### **4.5.2 Sampling**

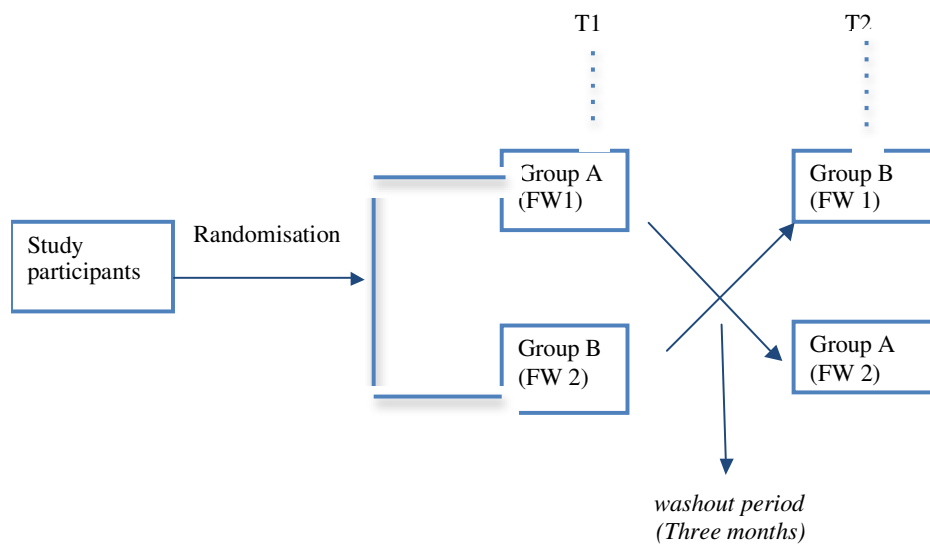
The pharmacy leadership organisations in the United Kingdom, New Zealand and Australia were approached and invited to assist with the project. These organisations were the: Pharmaceutical Society of Australia (PSA), Society of Hospital Pharmacists of Australia (SHPA), Royal Pharmaceutical Society of Great Britain, United Kingdom Clinical Pharmacy Association (UKCPA), and Pharmaceutical Society of New Zealand (PSNZ).

The organisations were invited to assist by disseminating the survey invite to their individual members via their mailing lists. The survey invite contained an overview and contact details of the study researchers. The research protocol, consent and enrollment forms were subsequently forwarded directly to individuals who responded to the invitation and indicated their willingness to be part of the study.

##### **4.5.2.1 Experimental design**

Study participants who successfully enrolled and consented to be part of the study were assigned an experimental code. This code was used to randomly allocate participants to either of two groups: A or B, using simple random allocation software.

**Figure 4.3: Schematic of the sequence of self-assessment proposed for this study.**



**Key: FW 1:** Royal Pharmaceutical Society Advanced Pharmacy Framework [RPS-APF (UK)]; **FW 2:** Advanced Pharmacy Practice Framework for Australia [APPF (AU)].

Study Participants assigned to Group A first self-assessed their competency using FW1 while those in Group B used FW2. After the three-months ‘wash-out’ period (between 26 February to 23 May 2014), participants in Group A ‘crossed over’ and assessed their practice using FW2 while those in Group B did same with FW1. Using this method, study participants carried out self-assessment of competence at the same time and in a predefined order of **FW 1: FW2** for those in Group A; and **FW2: FW1** for those in Group B.

The study was open-label with no blinding to group assignment. The schematic of the self-assessment sequence is presented in Figure 4.3. After randomisation, the study participants self-assessed their competence using the two frameworks in the order defined by group assignment. Each framework was reproduced as a questionnaire using Microsoft® Word with the inclusion of checkboxes for participants to assess their level of practice for each competency.

The first section of the assessment document collected demographic data while the second section contained matrices of competencies with the corresponding behaviours. Participants judged their competence individually and used the checkboxes provided to indicate their self-assessed level of practice per competency. Participants were also asked to indicate the type of

evidence they had available to support their assessment. A checklist of examples of evidence that could be used was also provided for each competency and participants were allowed to use as many evidence categories. They were however not required to submit such documents for confidentiality reasons.

Respondents were followed up three times within each assessment period. Reminder emails was forwarded every fortnight during this period.

#### **4.5.2.2 Data handling**

Contact with study participants was primarily through emails. All responses provided by the study participants were confidential and only the study investigators had access to the data obtained. The arbitrary experimental codes assigned to each participant ensured that no identifiable information was included in the database. All data collected was kept in locked filing cabinets in the FIP Collaborating Centre, UCL School of Pharmacy, United Kingdom.

The replies received from the practitioners were coded and entered into predefined template using Microsoft® Excel software. This was then uploaded and analysed with SPSS® version 21. Measures to minimize missing data were incorporated into the research design by pre-informing practitioner that answers to all questions in the self-assessment documents will need to be provided in order for the document to be accepted. One practitioner with incomplete assessment document was contacted for explanation at the end of the first assessment. This practitioner explained that the missing ranking indicated 'nil' competence for the affected competencies.

#### **4.5.3 Data analysis**

The analysis aimed to assess within-subject agreement between the two frameworks. When participants ranked their practice on the same level for matching competencies, then, there was agreement (between the frameworks) for that competency.

For example, when participants consistently ranked their practice on the same level for the 'reasoning & judgment' competency in the RPS-APF, and the matching 'use reasoning & judgement' competency in the APPF, then, there was agreement between frameworks for that competency. When level of practice differed for the same competency, then, there was disagreement.

This agreement was expressed using percentages. Kappa statistic, which is a measure of chance-corrected agreement between rankings at different time points, was also used to evaluate within-subject agreement.

K-values of  $0 < k < 0.21$  indicated *slight or poor* agreement;  $0.21 < k < 0.41$  *fair* agreement;  $0.41 < k < 0.61$  *moderate* agreement;  $0.61 < k < 0.81$  *substantial or good* agreement;  $k \geq 0.81$  *excellent* agreement; and  $k=1$  indicated *perfect* agreement (Cohen, 1960; Landis and Koch, 1977; Viera and Garrett, 2005). When the Kappa statistic value showed less than excellent agreement (that is, when  $k < 0.81$ ), and where the  $k$ -values were not statistically significant, further analysis using the Wilcoxon signed-ranked test was conducted.

Cramer's V was also used to measure association between the competencies. Values of  $V \leq 0.30$  indicated weak association;  $0.30 < V \leq 0.50$  moderate association;  $V > 0.50$  strong association while  $V=1$  indicated a perfect association (Cohen, 1988). Moderate, strong and perfect association implied the ranking in the first assessment was predictive of the ranking in the second assessment for matching competencies (Field, 2007; Weisburd and Britt, 2007b).

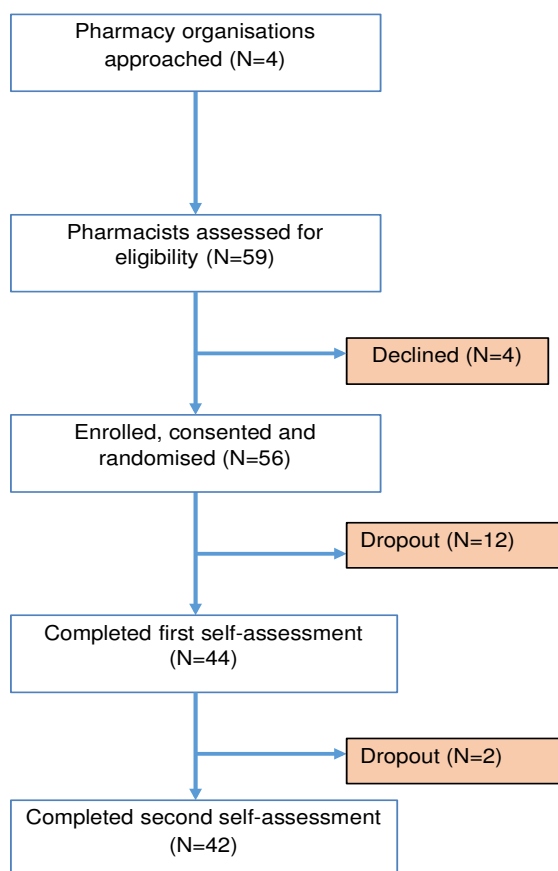
## 4.5.4 Results

### 4.5.4.1 Demography

Forty-two pharmacists from four countries: Australia, New Zealand, United Kingdom and Australia; completed the two self-assessments required for the crossover study.

Figure 4.4 illustrates the participant recruitment process.

**Figure 4.4: Flow chart showing participant recruitment**



Mean length of practice was 19 years [SD: 11; Min-Max: 5-52years]. More than half (57%) of the study participants indicated they were leading-edge practitioners (please see Appendix 9 for full description of level of competence).

Table 4.41 shows composition of the sample in relation to area of practice and country of origin while Table 4.42 shows participants' self-assessed level of competence.

**Table 4.41: Area of practice and country of origin of crossover study participants**

Area of Practice	Country of Origin N (%)				Total (%)
	UK	Australia	New Zealand	Ireland	
Hospital	10 (26)	15 (38)	13 (3)	1 (3)	<b>39 (93)</b>
Community	0 (0)	0 (0)	1 (100)	0 (0)	<b>1 (2)</b>
Academia	1 (100)	0 (0)	0 (0)	0 (0)	<b>1 (2)</b>
Primary health organisation	0 (0)	0 (0)	1 (100)	0 (0)	<b>1 (2)</b>
<b>Total (%)</b>	<b>11 (26)</b>	<b>15 (36)</b>	<b>15 (36)</b>	<b>1 (2)</b>	<b>42 (100)</b>

**Table 4.42: Crossover study participants' level of competence**

Level of practice	N (%)
Specialist-in-training	8 (19)
Experienced practitioner	10 (24)
Leading-edge practitioner	24 (57)

#### 4.5.4.2 Agreement in the Expertise and Expert skills cluster

Within-subject agreement ranged from 55% to 86% for the four competencies in this cluster. This means more than half of the study participants consistently ranked their practice on the same level for these competencies in the two self-assessments.

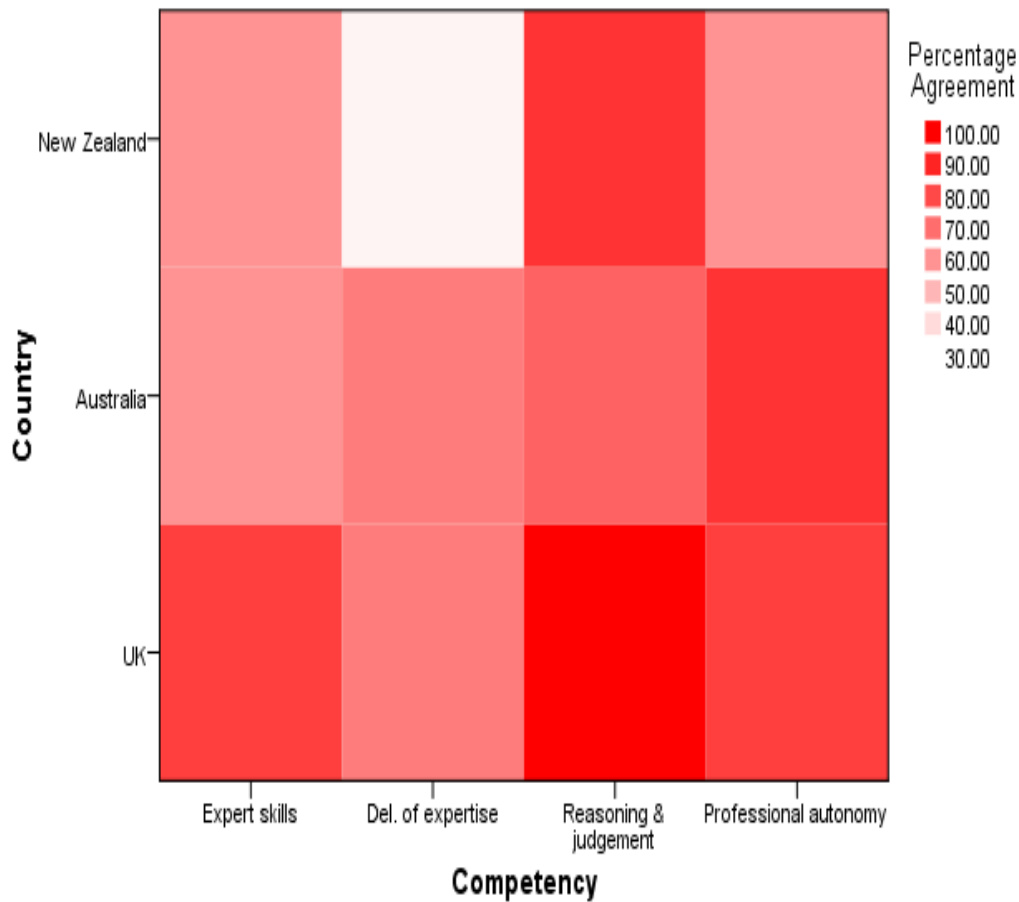
Table 4.43 shows the agreement per level of practice in this cluster including the Kappa statistic values.

**Table 4.43: Within-subject agreement per level of practice for the Expertise and Expert skills cluster**

Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic (k)
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
Reasoning & Judgment	2	12	22	36 (86)	0.725 (p<0.0001)
Professional autonomy	1	8	23	32 (76)	0.516 (p<0.0001)
Delivery of expertise	2	7	14	23 (55)	0.253 (p=0.024)
Expert skills	2	13	13	28 (67)	0.424 (p<0.0001)

Percentage agreement however varied between the countries. The lowest percentage agreement was in New Zealand (30%) in the 'professional expertise' competency. The agreement per country was 60% (or more) for the other competencies in the cluster (Figure 4.5).

**Figure 4.5: Percentage agreement in the Expertise and Expert skills cluster**



The kappa ( $k$ ) statistic values were suggestive of *fair* ( $0.21 < k < 0.41$ ), *moderate* ( $0.41 < k < 0.61$ ) and *substantial* ( $0.61 < k < 0.81$ ) agreement. The values were statistically significant ( $p \leq 0.05$ ) and showed less than excellent agreement ( $k < 0.81$ ) for all four competencies in the cluster. This was suggestive of inconsistency in ranking of competencies in the two assessments.

This was further evaluated using the Wilcoxon signed-rank test. The test showed no statistically significant within-subject difference between the ranking of competence in the first (median rank: 10) and second (median rank: 10) assessment for the four competencies in the cluster ( $Z = -0.838$ ,  $p = 0.402$ ; maximum rank score attainable = 12). There was also no significant within-subject difference between the two assessments in the country groups {UK:  $p = 0.343$ , Australia:  $p = 0.952$  and New Zealand:  $p = 0.574$ }.

Cramer's  $V$ , which was used to assess the strength of the association between competencies showed weak ( $V \leq 0.30$ ) association under the 'professional expertise' competency for New



Zealand. The association was moderate  $0.30 < V \leq 0.50$  for the UK group and strong ( $V > 0.50$ ) for the Australia group. This implies that the respondents in the New Zealand group were less consistent in their ranking for the 'delivery of expertise' competency. A perfect association was found within the UK and New Zealand group for the 'reasoning & judgement' competency ( $V=1$ ) while moderate to strong association was observed in the other competencies in cluster for the three countries. This means the ranking in the first assessment was predictive of the ranking in the second assessment for matching competencies in this cluster.

Overall, the results of these analyses (Table 4.43 and Figure 4.5) demonstrate agreement between the two frameworks for the competencies in this cluster.

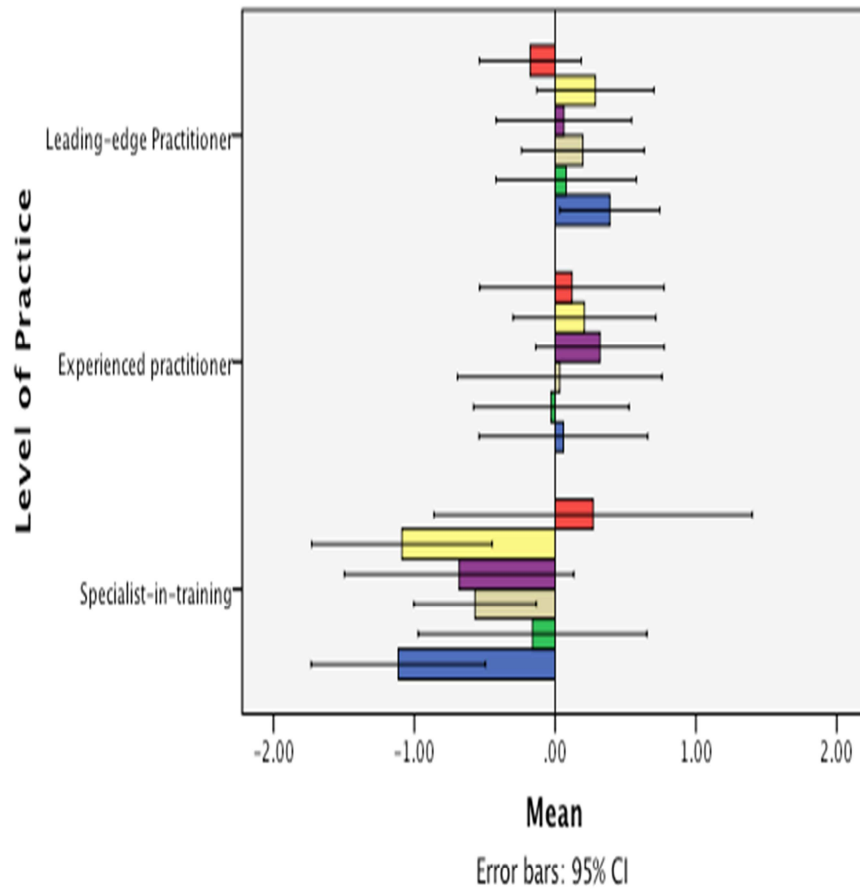
Figure 4.6 shows the outcome of the analysis of the evidence used to support self-assessments. It showed that leading edge practitioners [which is equivalent to the highest level/stage of advance practice and designated 'mastery' level in the RPS-APF and 'advanced level' in the APPF] used six main evidences to support their assessments.

These were: 'member of, or advice local/hospital committee'; 'member of regional, national or international committee'; 'active research participation'; 'research development and leadership'; 'managing process & leadership (at the local level)'; and 'managing process and leadership (international level)'.

Experienced practitioners {designated 'advanced stage 2' in the RPS-APF and 'consolidated level' in the APPF}, used four main evidences to support their assessments in this cluster: 'professional standing & peer status', 'document expert practice', 'managing process & leadership (at the local level)' and 'staff management'.

Specialists-in-training practitioners [equivalent to the 'advanced stage 1' in the RPS-APF and 'transition level' in the APPF] used 'educational development, design and provision' and 'other documentation' (Figure 4.6).

**Figure 4.6: Evidence used to support self-assessment in the Expertise and Expert skills cluster**



- Committee member (local/international)
- Education/teaching role
- Research role
- Professional/expert recognition
- Managerial/leadership role
- Other

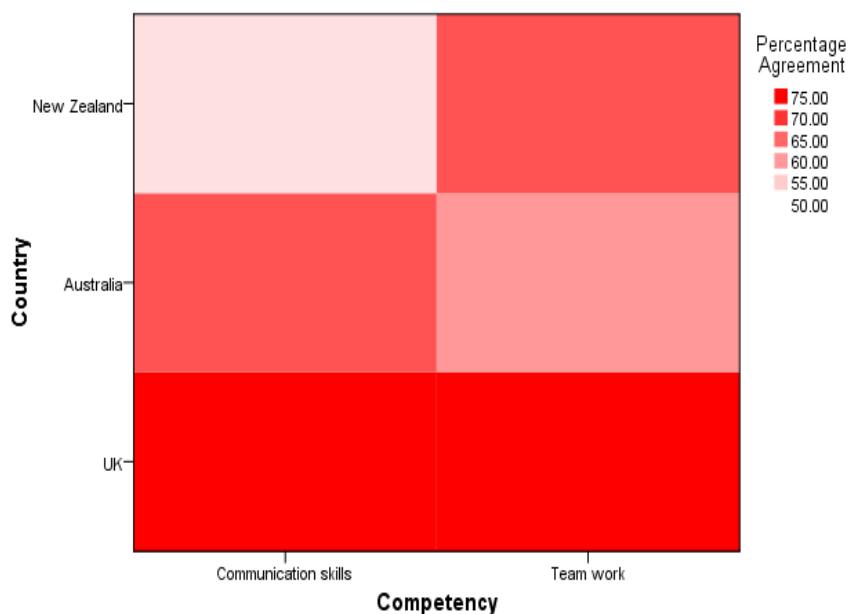
#### 4.5.4.3 Agreement in the Collaborative Practice Cluster

Within-subject agreement for the two competencies in this domain was 64% (Table 4.44). This indicates that approximately two-thirds of the participants consistently ranked their practice on the same level for the competencies in this cluster.

**Table 4.44: Within-subject agreement per level of advance practice for the Collaborative Practice competencies**

Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic ( <i>k</i> )
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
Communication skills	1	9	17	27 (64)	0.376 (p=0.002)
Team work	0	8	19	27 (64)	0.352 (p=0.004)

**Figure 4.7: Percentage agreement in the Collaborative Practice cluster**



The percentage agreement however varied between the countries in the cluster. The lowest agreement was 50% and this was from New Zealand in the 'communication skills' competency (Figure 4.7). The kappa (*k*) statistic values were indicative of *fair* agreement

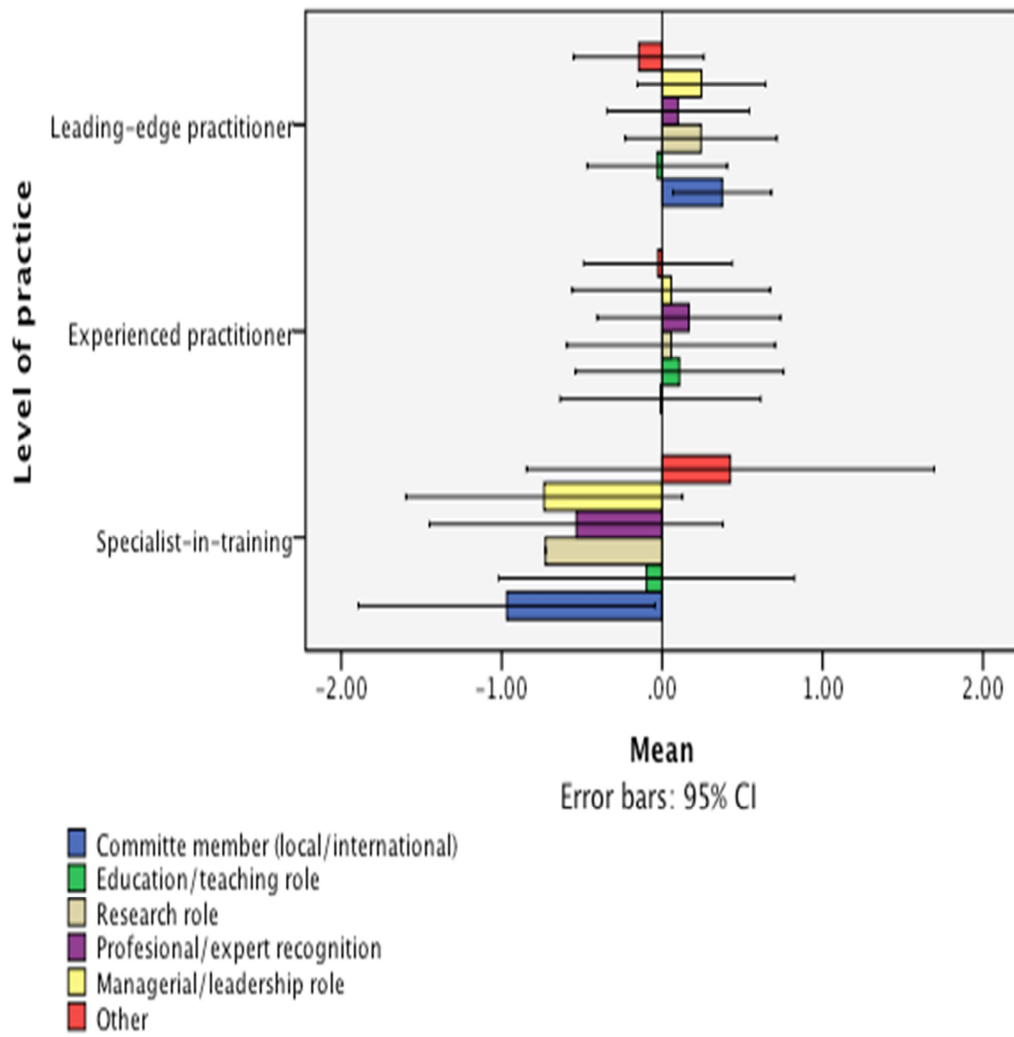
( $0.21 < k < 0.41$ ). The values were statistically significant but also indicated some within-subject change in ranking for the two competencies in the cluster (Table 4.44).

Further evaluation using the Wilcoxon signed-rank test showed a statistically significant within-subject difference in ranking of the competencies between the first (Median rank: 5) and second (Median rank: 6) assessments ( $Z = -2.027$ ,  $p = 0.043$ ; maximum rank score attainable = 6). It shows that respondents underestimated their competence in the first assessment. This difference was however not significant within the country groups {UK:  $p=0.131$ , Australia:  $P=0.431$  and New Zealand  $p=0.176$ }, even though, the median ranks differed between the first (Median rank: 4) and second (Median rank: 5) assessments for UK and New Zealand but not for Australia. This suggests that participants from UK and New Zealand were less consistent in their ranking in this cluster compared to Australia.

Cramer's V measure of association indicated a strong relationship ( $V > 0.50$ ) between matching competencies in the cluster. This association was however relatively less in the 'team work' competency ( $0.55 < V < 0.65$ ) compared to the 'communication skills' competency ( $0.65 < V < 0.80$ ).

Figure 4.8 shows the outcome of the analysis of evidences used to support self-assessments. It showed that leading edge practitioners used five main evidences to support their assessments. These were: 'member of local or trust committee', 'member regional, national and international committee', 'research development and leadership', 'professional standing and peer status', and 'managing process and leadership (international level)'. Experienced practitioners used four main evidences to support their assessments in this cluster. These were the 'educational development, design and provision', 'active research participation', 'professional standing and peer status', and 'staff management'. Specialists in training mainly used 'other documentation' evidence to support their practice

**Figure 4.8: Evidence used to support self-assessment in the Collaborative Practice cluster**



#### 4.5.4.4 Agreement in the Leadership Cluster

Observed within-subject agreement ranged from 43% to 69% for the five competencies in the leadership cluster (Table 4.45).

**Table 4.45: Within-subject agreement per level of practice for the Leadership competencies**

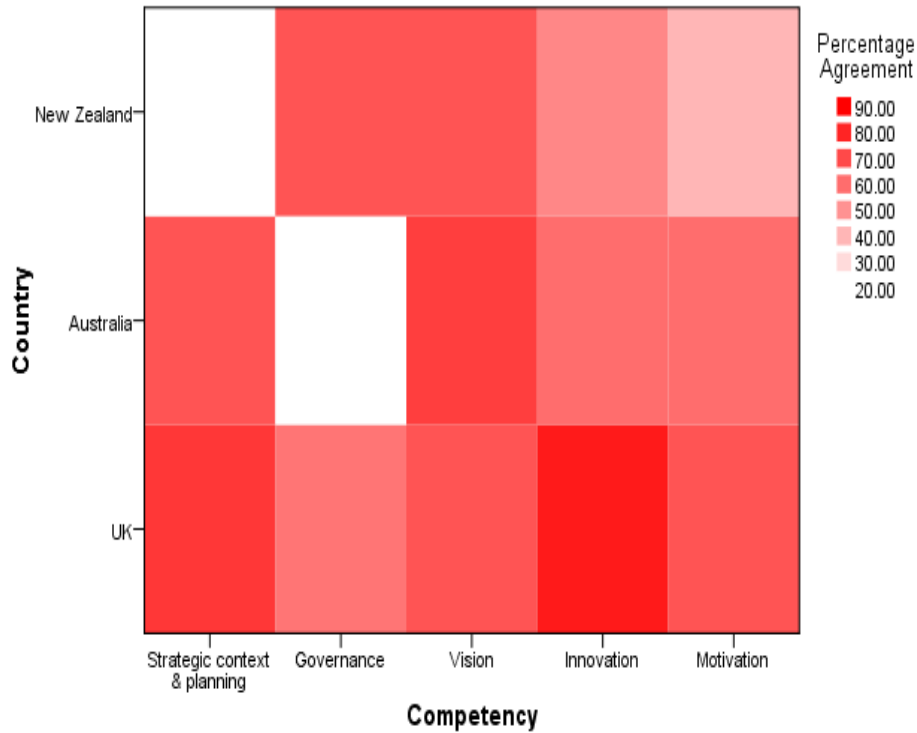
Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic (k)
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
Strategic context & planning	6	18	4	28 (67)	0.426 (p<0.0001)
Governance	3	5	10	18 (43)	0.13 (p=0.214)
Vision	5	14	10	29 (69)	0.558 (p<0.0001)
Innovation & service dev.	6	10	11	27 (64)	0.455 (p=0.001)
Motivation	1	14	8	23 (55)	0.227 (p=0.044)

The lowest agreement was in Australia (20%) and New Zealand (20%) for the 'governance' and 'strategic context and planning' competencies respectively. This indicates that the two countries were less consistent in their ranking for these two competencies (Figure 4.9).

The kappa (*k*) statistic values were indicative of *slight* ( $0 < k < 0.21$ ), *fair* ( $0.21 < k < 0.41$ ), and *moderate* ( $0.41 < k < 0.61$ ) agreement. These values were statistically significant for all the competencies except the 'national priorities' competency. The *k*-values also showed some disagreement in ranking of level of practice between the two self-assessments (Table 4.46).

Further evaluation using the Wilcoxon signed-rank test showed no significant within-subject difference in ranking between the first (Median rank: 13) and second (Median rank: 14) assessments ( $Z = -0.897$ ,  $p = 0.370$ ; maximum rank score attainable = 15). The median scores however suggested the participants underestimated their competence in the first assessment. There was also no significant difference within the country groups {UK:  $p=0.717$ , Australia:  $P=0.705$  and New Zealand  $p=0.775$ }.

**Figure 4.9: Percentage agreement in the Leadership cluster**

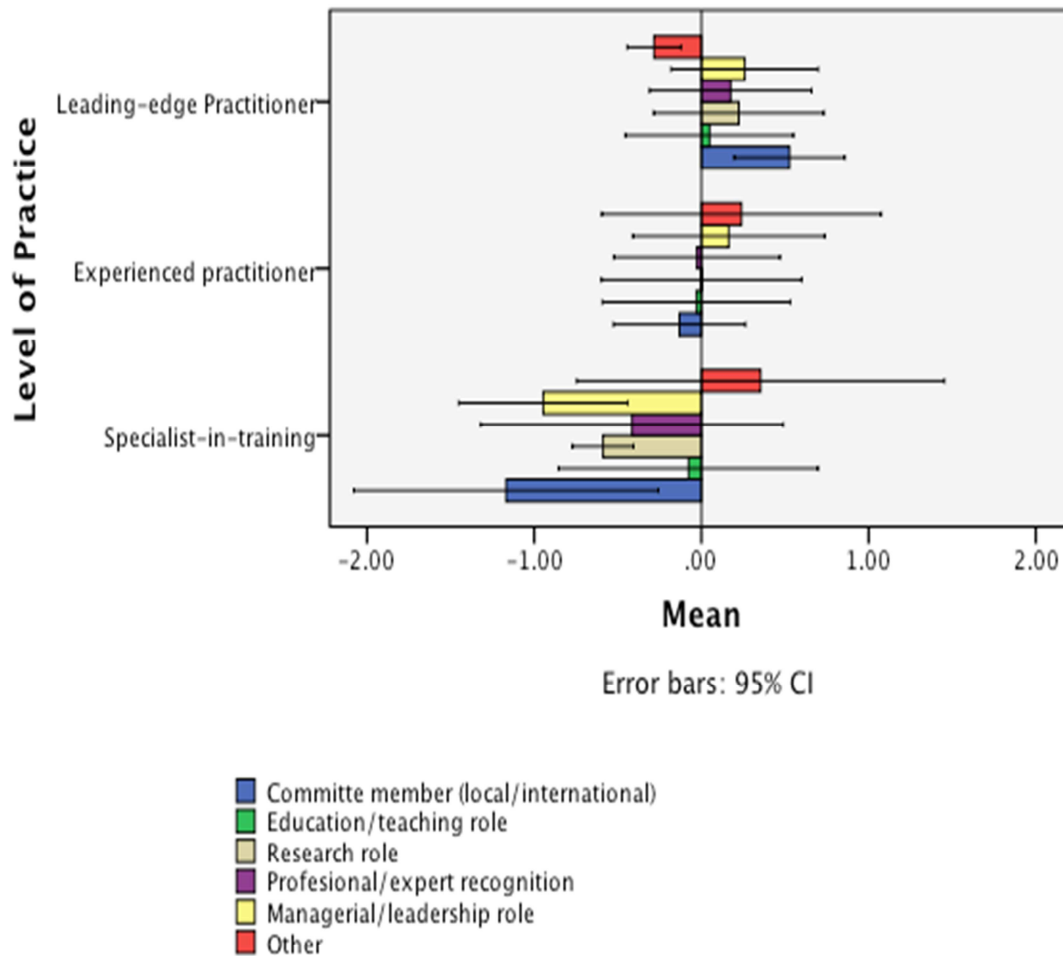


No association was observed between rankings for the 'strategic context & planning' competency in the Australia group. A weak association was observed within the New Zealand group for 'motivation' ( $V \leq 0.30$ ) competency. Moderate ( $0.30 < V \leq 0.50$ ) and strong ( $V > 0.50$ ) association was found within the three countries for the other competencies in the cluster. This means the ranking in the first assessment was predictive of the ranking in the second assessment for matching competencies. A perfect association ( $V=1$ ) was observed within the UK group for the 'vision', and 'innovation' competencies.

Overall, the results of these analyses (Table 4.46 and Figure 4.9) show some inconsistency in ranking in two competencies, although, this was not statistically significant within the groups. Figure 4.10 shows the outcome of the analysis of evidences used to support self-assessment in this cluster. Leading edge practitioners used five main evidences to support their assessments. These were: 'member of local or trust committee'; 'member regional, national and international committee'; 'active research participation'; 'managing process and leadership (local level)'; and 'managing process and leadership (international level)'. Experienced

practitioners used three main evidences to support their assessments in this cluster. These were 'member of, or advice local/hospital committee', 'staff management' and 'other documentation'. Specialist-in-training mainly used the 'other documentation' evidence to support their practice in this cluster.

**Figure 4.10: Evidence used to support self-assessment in the Leadership cluster**





#### 4.5.4.5 Agreement in the Management cluster

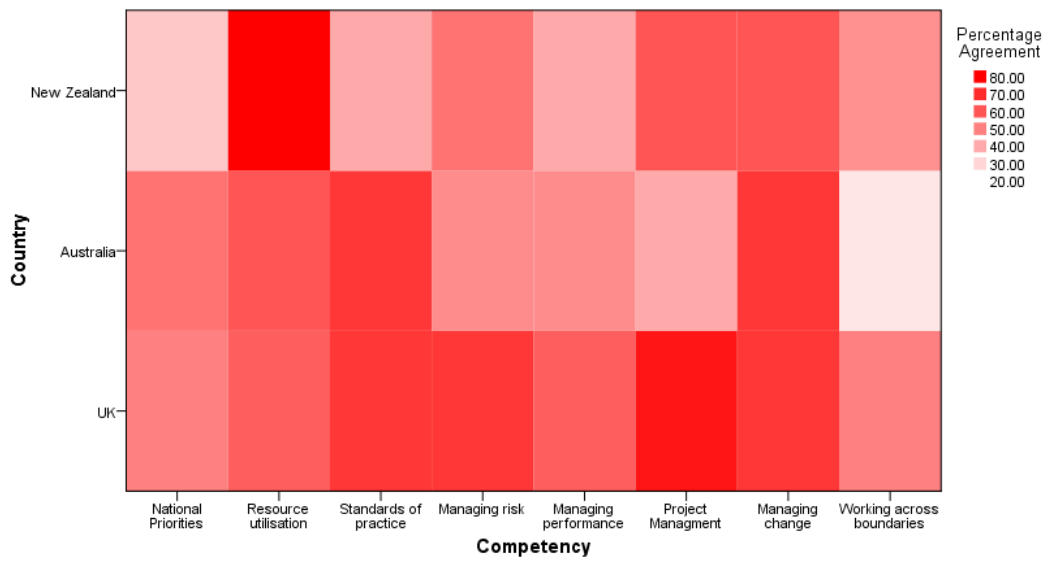
Within-subject agreement ranged from 45% to 67% for the eight competencies in this cluster (Table 4.46). The percentage agreement varied between the countries with the lowest agreement observed in the Australia group for the 'project management' (30%) and 'working across boundaries' (20%) competencies (Figure 4.11).

**Table 4.46: Within-subject agreement per level of practice for the Management competencies**

Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic ( <i>k</i> )
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
National priorities	4	11	4	19 (45)	0.161 ( <i>p</i> =0.098)
Resource utilisation	5	12	11	28 (67)	0.479 ( <i>p</i> <0.0001)
Standard of practice	3	11	10	24 (57)	0.340 ( <i>p</i> <0.0001)
Managing risk	5	10	8	23 (55)	0.328 ( <i>p</i> =0.001)
Managing performance	5	13	2	20 (48)	0.215 ( <i>p</i> =0.016)
project management	4	10	10	24 (57)	0.357 ( <i>p</i> <0.0001)
Managing change	6	15	7	28 (67)	0.474 ( <i>p</i> <0.0001)
Working across boundaries	3	5	9	17 (41)	0.170 ( <i>p</i> =0.049)

The kappa (*k*) statistic values were indicative of *slight* ( $0 < k < 0.21$ ) to *moderate* agreement ( $0.41 < k < 0.61$ ). These values were statistically significant for all the competencies except the 'national priorities' competency but showed some disagreement between the frameworks (Table 4.47). Further evaluation using the Wilcoxon signed-rank test showed there was no statistically significant within-subject difference in ranking between the first (median rank: 18.5) and second (median rank: 19.5) assessments { $Z = -1.197$ ,  $p=0.231$ , maximum rank score attainable = 24}. The median ranks indicate that participants underestimated their competence in the first assessment. Wilcoxon-signed rank test also showed no significant difference between rankings in the three countries {UK:  $p=0.306$ , Australia:  $p=0.648$ , New Zealand  $p=0.509$ }.

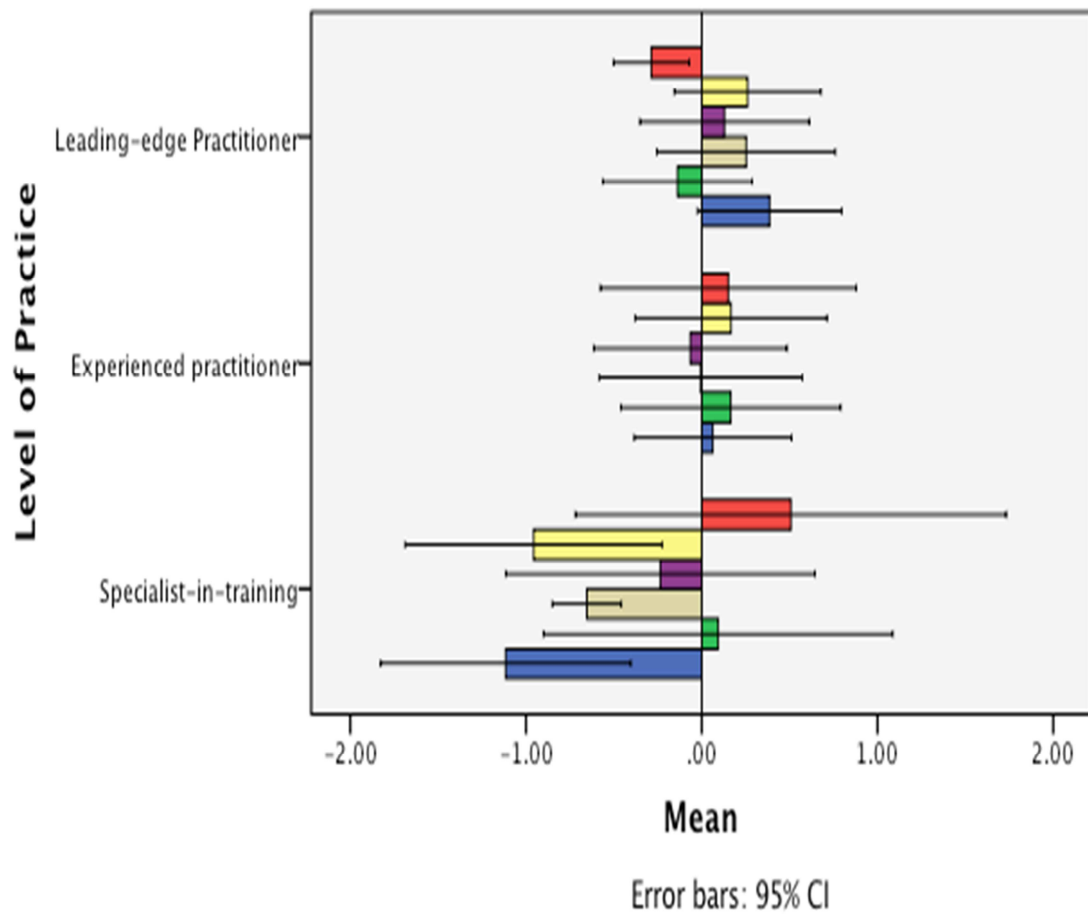
**Figure 4.11: Percentage agreement in the Management cluster**



Cramer's  $V$  showed a weak ( $V \leq 0.30$ ), moderate ( $0.31 < V \leq 0.50$ ) to strong ( $V > 0.50$ ) association between matching competencies. Weak association was from Australia in the 'national priorities' and 'managing risk' competencies. Moderate and strong association was found in the other competencies for the three countries. This means that for these competencies, the ranking in the first assessment was predictive of the ranking in the second assessment. Overall, the results (Figure 4.11 and Table 4.46) demonstrate agreement between the frameworks for the competencies in this domain.

Figure 4.12 shows the outcome of the analysis of evidences used to support self-assessment in this cluster. It showed that leading edge practitioners used seven main evidences to support their assessments. These were: 'member regional, national and international committee'; 'active research participation'; 'research development and leadership'; 'professional standing & peer status'; 'managing process and leadership (local level)'; 'managing process and leadership (international level)', and 'staff management'. Experienced practitioners used five main evidences to support their assessments in this cluster. These were 'member of, or advice local/hospital committee', 'active teaching role', 'management process and leadership (local)', 'staff management' and 'other documentation'. Specialist-in-training mainly used three evidences to support their assessment. These were 'educational development, design and provision', 'documented expert practice', and 'other documentation'.

**Figure 4.12: Evidence used to support self-assessment in the Management cluster**



- Committee member (local/international)
- Education/teaching role
- Research role
- Professional/expert recognition
- Managerial/leadership role
- Other

#### 4.5.4.6 Agreement in the Education, Training & Professional Development cluster

Within-subject agreement ranged from 57% to 71% for the five competencies in this cluster (Table 4.47). This means more than half of the participants consistently ranked their practice on the same level for all the competencies in this domain. The percentage agreement however varied between the countries with the lowest agreement observed in Australia (40%) and United Kingdom (50%) for the 'professional development' competency (Figure 4.13).

**Table 4.47: Within-subject agreement per level of practice for the Education, Training & Professional Development competencies**

Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic ( <i>k</i> )
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
Role model & mentorship	3	13	10	26 (62)	0.394 (p=0.001)
Education & Training	2	18	5	25 (60)	0.285 (p=0.007)
Professional development	5	14	5	24 (57)	0.299 (p=0.006)
Link practice to education	8	12	6	26 (62)	0.42 (p=0.001)
Educational Policy	13	14	3	30 (71)	0.60 (p<0.0001)

The *k*-values were indicative of *fair* ( $0.21 < k < 0.40$ ) to *moderate* agreement ( $0.41 < k < 0.61$ ). These were all statistically significant and also suggested some within-subject disagreement (Table 4.48). Further evaluation using the Wilcoxon signed-rank test showed there was no statistically significant within-subject difference in ranking between the first (median rank: 12) and second (median rank: 12) assessment { $Z = -0.543$ ,  $p = 0.587$ ; maximum rank score attainable = 15}. This was also not significant within the country groups {UK:  $p = 0.438$ , Australia:  $p = 0.783$ , New Zealand:  $p = 0.589$ }. Cramer's *V* showed perfect association ( $V = 1$ ) for the 'professional development' competency within the New Zealand group; and for the 'educational policy' competency within the Australia group. Moderate ( $0.30 < V \leq 0.50$ ) to strong ( $V > 0.50$ ) association was observed within the three country groups for the other competencies in the cluster. This means that for these competencies, the ranking in the first assessment was predictive of the ranking in the second assessment.

Overall, the results (Figure 4.13 and Table 4.48) demonstrate agreement between the frameworks for the competencies in this domain.

**Figure 4.13: Association between matching competencies in the Education, Training and Professional Development cluster**

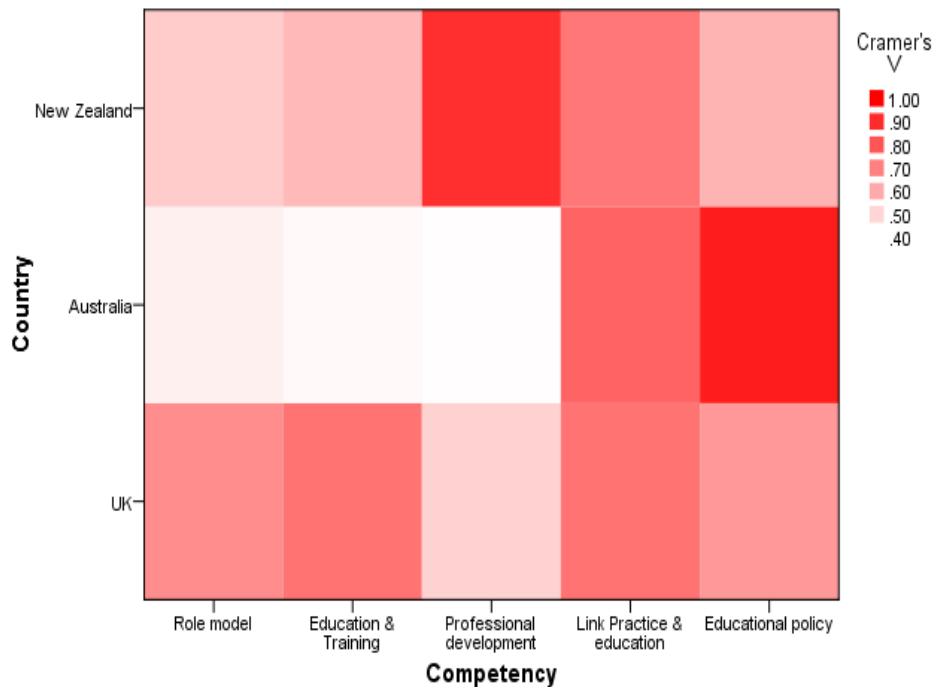
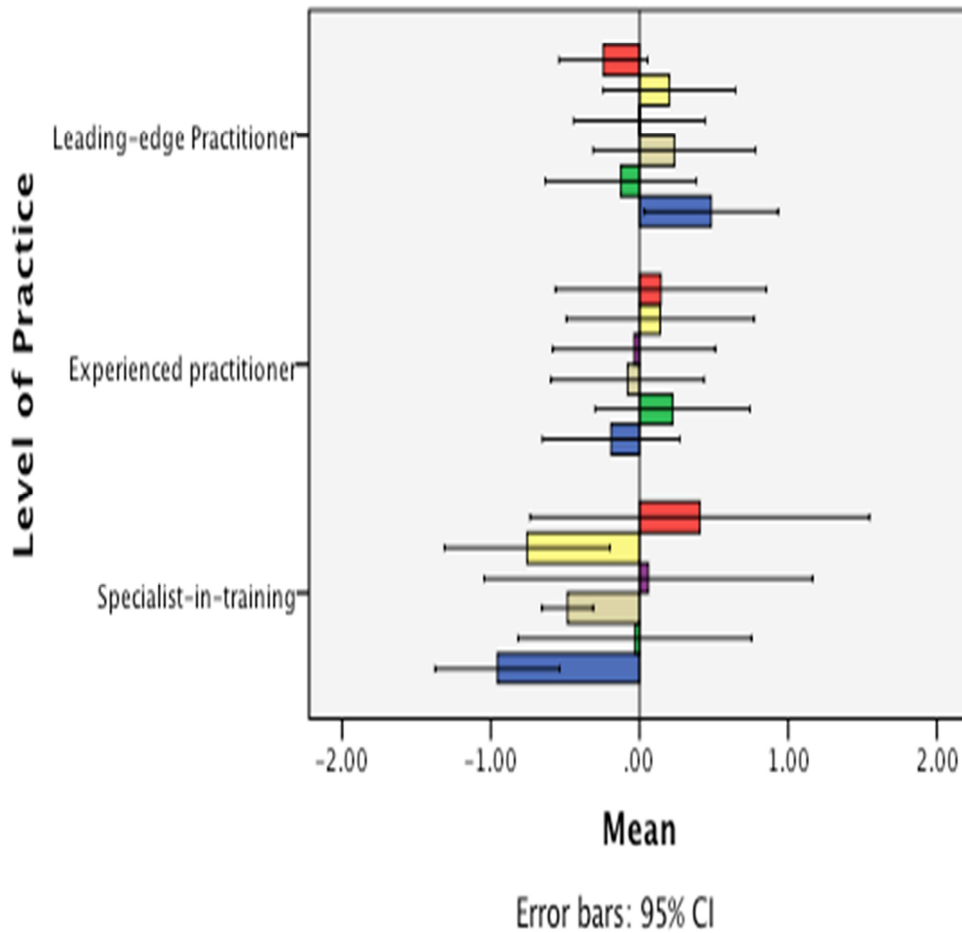


Figure 4.14 shows the outcome of the analysis of evidences used to support self-assessment in this cluster. It showed that leading edge practitioners mainly used seven evidences to support their assessments. These were: 'member of, or advice local/hospital committee'; 'member regional, national and international committee'; 'active research participation'; 'research development and leadership'; 'professional standing or peer status'; 'managing process and leadership (local level)'; and 'managing process and leadership (international level)'. Experienced practitioners used four main evidences to support their assessments in this cluster. These were 'active teaching role', 'educational development, design and provision', 'staff management' and 'other documentation'. Specialists-in-training mainly used two main evidences to support their assessments. These were 'documented expert practice' and 'other documentation'.

**Figure 4.14: Evidence used to support self-assessment in the Education, Training and Professional Development cluster**



- Committe member (local/international)
- Education/teaching role
- Research role
- Professional/expert recognition
- Managerial/leadership role
- Other

#### 4.5.4.7 Agreement in the Critical appraisal, Evaluation & Research cluster

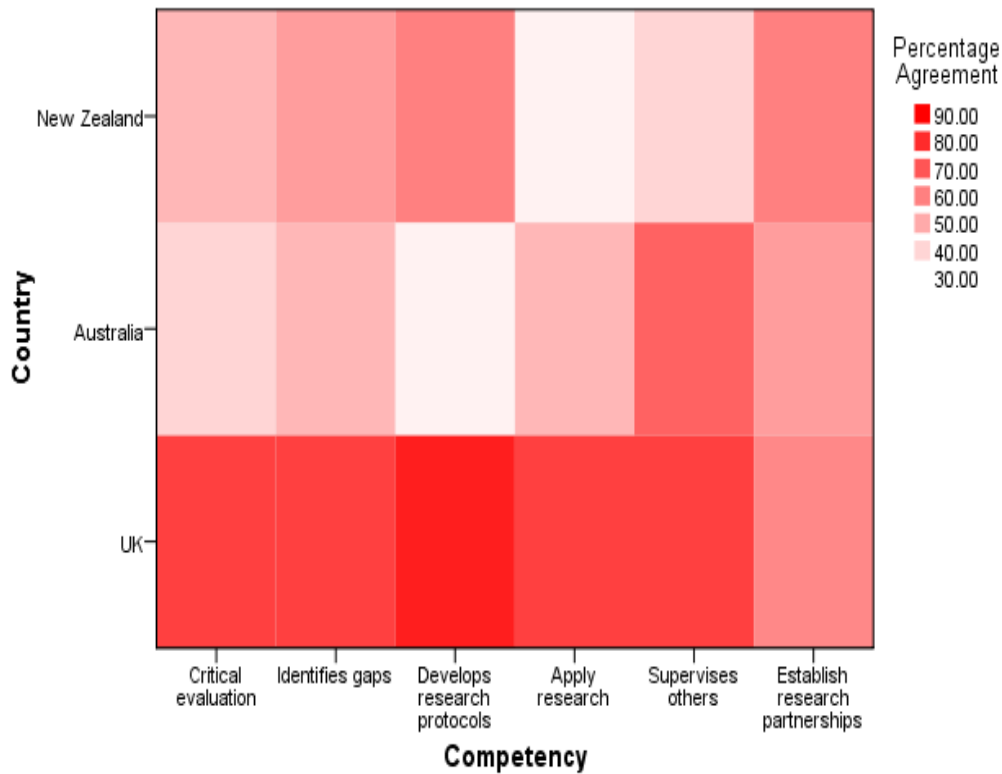
Within-subject agreement ranged from 52% to 60% for the seven competencies in this cluster. This means more than half of the participants consistently ranked their practice on the same level for all the competencies in the cluster (Table 4.48). The percentage agreement varied between the countries with the lowest agreement observed in Australia and New Zealand for the 'develop research protocols' (30%) and 'apply research' (40%) competencies respectively (Figure 4.15).

**Table 4.48: Within-subject agreement per level of practice for the Critical appraisal, Evaluation & Research competencies**

Competencies	Agreement per level of advanced practice (N=42)			Total N (%)	Kappa statistic (k)
	Adv. Stage 1 (Transition)	Adv. Stage 2 (Consolidation)	Mastery (Advanced)		
Critical evaluation	5	9	8	22 (52)	0.289 (p=0.005)
Identifies gaps in evidence base	11	6	7	24 (57)	0.382 (p<0.0001)
Develop & evaluates research protocols	12	6	7	25 (60)	0.466 (p<0.0001)
Apply research evidence	7	6	8	21 (50)	0.351 (p<0.0001)
Supervises others undertaking research	11	8	6	25 (60)	0.551 (p<0.0001)
Establishes research partnership	12	7	5	24 (57)	0.539 (p<0.0001)

The kappa ( $k$ ) statistic values were indicative of *fair* ( $0.21 < k < 0.41$ ) to *moderate* ( $0.41 < k < 0.61$ ) agreement. These values were statistically significant for all seven competencies. The  $k$ -values indicated inconsistencies in ranking of matching competencies. Further evaluation using the Wilcoxon signed-rank test showed there was no statistically significant within-subject difference in ranking between the first (median rank: 13) and second (median rank: 13.5) assessments for the competencies in this cluster  $\{Z = -1.465, p = 0.143; \text{maximum rank score attainable} = 18\}$ . This was also not significant within the countries  $\{\text{UK: } p = 0.932, \text{Australia: } p = 0.206, \text{New Zealand: } p = 0.345\}$ .

**Figure 4.15: Percentage agreement in the Critical appraisal, Evaluation & Research cluster**



A perfect association ( $V=1$ ) was observed within the UK group for the 'establish research partnership' competency. Moderate ( $0.30 < V \leq 0.50$ ) to strong ( $V > 0.50$ ) association was observed within the three groups for most (83%) of the competencies in the cluster. This means the ranking in the first assessment was predictive of the ranking in the second assessment for all the competencies in the cluster.

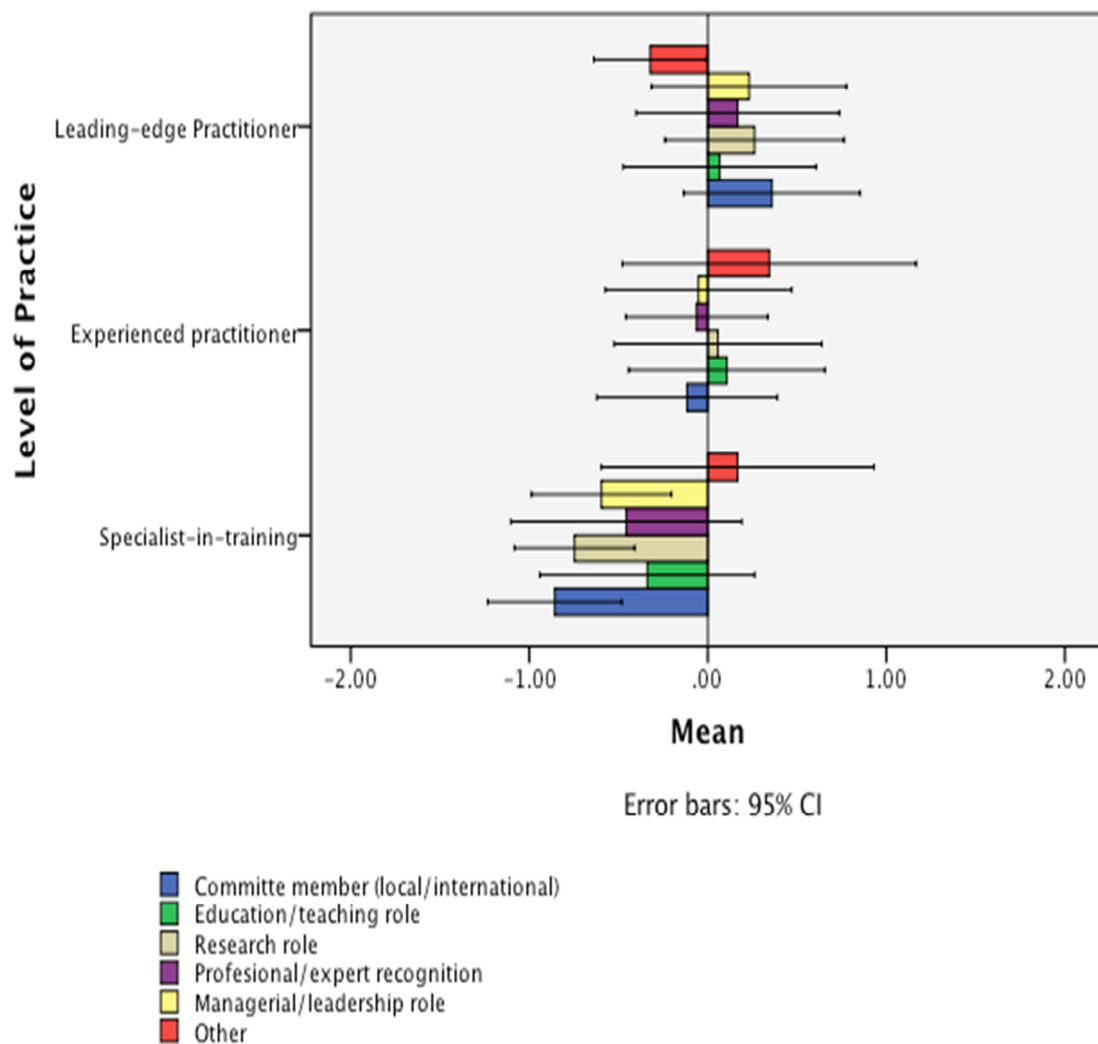
Overall, the results (Figure 4.15 and Table 4.48) demonstrate agreement between the frameworks for the competencies in this cluster.

Figure 4.16 shows the outcome of the analysis of evidences used to support self-assessment in this cluster. It showed that leading edge practitioners mainly used seven main evidences to support their assessments. These were: 'member of, or advice local/hospital committee', 'member regional, national and international committee', 'active research participation', 'research development and leadership', 'professional standing and peer status', 'managing



process and leadership (international level)' and 'staff management'. Experienced practitioners used five main evidences to support their assessments in this cluster. These were 'member of, or advice local/hospital committee', 'active teaching role', 'research development and leadership', 'managing process and leadership (local level)', and 'other documentation'. Specialists in training mainly used the 'other documentation' evidence to support their assessment.

**Figure 4.16: Evidence used to support self-assessment in the Critical appraisal, Evaluation and Research cluster**



#### 4.6 Summary of crossover study results

The study sample mainly comprised pharmacists in hospital practice (93%) with more than half (57%) of the participants indicating they were leading-edge practitioners. Participants were able to rank their practice on the continuum of advanced pharmacy practice for all 64 competencies in the two frameworks. The ranking of level of practice was however not consistent between the two self-assessments for some competencies.

Direct observed agreement ranged from 43% in the 'national priorities' competency to 86% in the 'reasoning & judgement' competency. The *k*-values indicated *slight* ( $0 < k < 0.21$ ), *fair* ( $0.21 < k < 0.41$ ), *moderate* ( $0.41 < k < 0.61$ ) and *substantial* ( $0.61 < k < 0.81$ ) agreement for all the matching competencies evaluated:

- Slight agreement was observed in three (10%) competencies: 'governance', 'working across boundaries' and 'national priorities'. The *k*-values for two of these competencies ('governance' and 'national priorities') were not statistically significant ( $p > 0.05$ ).
- Fair agreement was observed in fourteen (47%) competencies: 'delivery expertise', 'communication', 'team work', 'motivation', 'standard of practice', 'managing risk', 'project management', 'managing performance', 'role model & mentorship', 'professional development', 'education & training', 'critical evaluation', 'identifies gaps in the evidence base' and 'apply research evidence'.
- Moderate agreement was observed in twelve (40%) competencies: 'professional autonomy', 'expert skills', 'strategic context & planning', 'vision', 'innovation & service development', 'resource utilisation', 'managing change', 'link practice and education', 'educational policy', 'develops and evaluates research protocol', 'supervises others undertaking research' and 'establish research partnerships'.
- Substantial agreement was observed in the 'reasoning and judgment' competency.

However, none of the competencies showed *excellent* agreement based on the Kappa values obtained. Wilcoxon signed rank test showed a statistically significant within-subject difference in the collaborative practice cluster. This difference was not observed in the other five clusters. Cramer's *V* showed *no association* ( $V=0$ ) under 'strategic context and planning' competency within the Australia group. This indicates that for this competency, the ranking of this competency in the first assessment was not predictive of the ranking in the second assessment for the participants from Australia.

A weak association ( $V \leq 30$ ) was observed in three (10%) competencies. This was within the New Zealand group for the 'motivation' competency under the leadership cluster, and in the Australia for the 'national priorities' and 'managing risk' competencies under the management cluster. Moderate ( $30 < V \leq 50$ ) and strong ( $V > 50$ ) associations were observed within the three country groups for 20 (67%) competencies while a perfect association was found within the groups for 6 (20%) competencies. The perfect association ( $V=1$ ) was in the:

- 'reasoning and judgement' competency under the expertise & expert skills cluster;
- 'vision' and 'innovation' competencies under 'leadership' cluster;
- 'professional development' and 'educational policy' competencies under the education, training and professional development cluster; and
- 'develops research protocols' competency under the 'evaluation & research clusters.

The moderate, strong and perfect associations suggest that individual rankings in the first assessment were predictive of the rankings in the second assessment within the countries groups. This was observed for 26 (87%) competencies.

The evidences used to support assessment also varied between the three levels of practice. Leading edge practitioners, equivalent to the highest level of advance practice, used five main evidences to support their practice in the six clusters. These evidences were: 'member of, or advice local/hospital committee'; 'member of regional/national or international committee'; 'active research participation'; research development & leadership'; and 'managing process & leadership (international level)' evidences. The experience practitioners mainly used the 'staff management' and 'other documentation' evidences to support their assessment in all clusters. They were however less able to support their assessment in the evaluation and research cluster. The specialist-in-training respondents mainly used the 'other documentation' evidence to support their practice. Generally, specialist-in-training and experienced practitioners were less able to support their assessment in the evaluation and research cluster compared to the leading-edge practitioners.

Overall, the results demonstrate within-subject consistency in ranking for 26 (87%) of the competencies identified in the two frameworks.

## **4.7 Stage 5: Qualitative Interviews**

The aim of this stage was to explore participant perception of the two advanced pharmacy frameworks used in this study. It also aimed to obtain practitioners' inputs on the two self-assessment processes.

### **4.7.1 Participants recruitment**

At the end of the crossover study, all 42 participants who successfully completed the two assessments were approached and invited, via email, to participate in a semi-structured telephone interview. The geographic location of the study participants precluded face-to-face interviews and so telephone interviews were conducted.

The interviews were conducted over three weeks from July 7<sup>th</sup> to August 5<sup>th</sup> 2014. Verbal permission for recording was obtained from the participants at the start of the conversation and the interviews lasted for 15-20minutes. Each conversation was recorded and transcribed verbatim. The transcriptions were then read and thematically coded manually. A copy of the transcripts was also forwarded to the respective participants. The interview schedule is presented in Appendix 10 while the invite is presented in Appendix 11.

### **4.7.2 Results**

#### **4.7.2.1 Demography**

Participants were interviewed until redundancy with seventeen participants interviewed in total. These participants were from the four countries represented in the crossover study and included 7 (47%) from Australia, 4 (27%) from New Zealand, 5 (42%) from United Kingdom, and 1 (100%) from Ireland.

Eighty-eight percent of the interviewees were in hospital practice while two (12%) were in academia. Majority were leading edge practitioners (76%), three were experienced practitioners (18%), and one was a specialist-in-training (6%). The average length of practice was 17 years (S.D: 8years).

Participants were asked open-ended questions covering two broad themes: the self-assessment process, and perceptions about the two frameworks (Appendix 10).

#### 4.7.2.2 Emergent interview themes

##### A) Prior self-assessment experience

This code described previous self-assessment experience prior to the study. The question that elicited the code aimed to determine whether the study participants had participated in a formal self-assessment process before the study.

Eight of the interviewees (47%) had formal self-assessment experience prior to the study but this was at the foundation level for the majority.

*'Yes, we have something similar to what you've got in UK and it is the Queensland GLF, so have only done this at the foundation level, not at the advance level.'*

A35, female, experience practitioner, Australia

*'Yes, but this is the first time I have done this at this level. Ever since I completed my post-graduate diploma which was basically mapped against the GLF, I haven't used anything else to sort of guide my development or see where I am at.'*

A48, male, experienced practitioner, UK

*'Yes, but not the same as this; we have to do it for our recertification. We carry out a self-assessment against our competency standards once every three years.'*

B11, Female, leading edge practitioner, New Zealand

However two of the interviewees had used one of the frameworks for formal self-assessment at an advanced level.

*'Yes, I was involved with the CODEG process in 2006, so I have used the framework (RPS-APF) on a few occasions since then.'*

B26, male, leading edge practitioner, UK

*'Yes, I am familiar with the process; I have just completed my portfolio for submission to the RPSGB faculty using the RPS-APF.'*

B5, female, leading edge practitioner, UK

Others had not undertaken any formal self-assessment prior to the study, but have used one or both of the frameworks to develop organisation-specific frameworks.

*'No, not formally, but, I have been involved in the development of the Australian Accident & Emergency Medicine Pharmacy Framework, so I have worked a bit with the APPF but have never used it to assess my own practice.'*

A51, Female, experience practitioner, Australia

*'No, not formally in my own practice, though I am involved in building evidence for advanced practice in emergency pharmacy for my hospital in Queensland. So, I have experience with the Australian framework'*

B31, male, leading edge practitioner, Australia

Some of those with no prior self-assessment experience were interested and motivated to do so because they thought it would be a useful process.

*'No, I have never done something like this before. Though I have been in a management position for just over two years; I never thought of doing something like this ... when I saw the advertisement by our hospital pharmacy society, I thought it would be useful to give it a go, just to see where my practice was.'*

A55, male, leading edge practitioner, Australia

## **B) Usability of the frameworks**

This code describes perception about clarity and ease of use of the two frameworks. The interview question that elicited the code aimed to explore participants' opinion about the frameworks.

All interviewees indicated the wordings of the competencies and corresponding descriptors were unambiguous and easy to understand.

*'I thought the frameworks were quite clear in their description. Initially, I needed to get the examples close to me and refer to them as I was going through it. But once I got my head around what the terminologies were, then it was easy to use.'*

B11, female, leading edge practitioner, New Zealand

*'The wording was clear in both framework, although, I found it got a bit repetitive after a while. I also understood and appreciated the explanatory notes attached'.*

B33, leading edge practitioner, Ireland

*'I thought the competencies and developmental descriptors were clear and I found them to be quite similar; so much so that I had to go back and look for differences between the frameworks'.*

A21, female, leading edge practitioner, Australia

They reported some difficulties completing the framework in the first round but were more comfortable with the process by the second assessment. Some thought reflection and exposure to the framework in the first round might have made completing the second assessment easier.

*'When I first saw the framework, I thought wow ... it felt a little bit overwhelming but when I read through the instructions and gave myself time to reflect, I felt more comfortable. The second round was a lot easier maybe because I sort of knew what the format was'.*

B11, female, leading edge practitioner, New Zealand

*'I felt a bit lost the first time; I thought it was a bit difficult to comprehend. But by the second time I was quite familiar with the logic of the framework and knew what to do'.*

A55, male, leading edge practitioner, Australia

*'I actually found the second assessment easier to do. I can't remember which framework I used the second time but I remember I found it easier to do. I don't know whether that was because it was easier, or maybe because I had already done it before, like a similar one, and was already familiar with the process'.*

B47, female, leading edge practitioner, Australia

Others expressed difficulty with identifying appropriate evidence for use in supporting self-assessment

*'What evidence is needed is not clear in terms of the actual level of evidence. For example I regularly write and present half hour educational presentations for nurses and others; I don't know where than sits in this framework. Also how do you provide evidence in the research cluster? Do you mean like writing a paper, presenting a poster at a conference or what?'*

B47, female, Australia, leading-edge practitioner

*'What I did find slightly difficult was selecting the right categories that my evidence goes into. I had to refer back to information you sent about all the different meanings and I don't think all my evidence kind of neatly fitted into all the categories that were given. So, that probably was more difficult'.*

A35, female, Australia, Experience practitioner

Some indicated that this initial difficulty might have resulted in them underestimating their perceived level of competence in some competencies.

*'I had an incidence the other day involving a work colleague ... in the end I found myself thinking that may be I had underestimated my competence. I found myself thinking that may be if I actually searched through my hard drive and found everything I have done, may be I would have more evidence than I gave myself credit for'.*

A35, female, experience practitioner, Australia

Others also thought they may have underestimated their competence in the first assessment

*'When I compared my assessment at the end, I saw that in some areas I thought I had progress but I couldn't see how much work I had done over the three months period we had. But thinking back, it might be the fact that some of my projects may have been in motion at the time I did my first assessment but were completed, or more at an advance stage, when I did the second one. That may explain it because I do think that the frameworks were similar'.*

A48, male, experience practitioner, UK



Practitioners also reported that completing the framework was time consuming and required a lot of reflection. But, this was less so by the second assessment.

*'Even though I was quite familiar with the frameworks and evidence, I found it time consuming and difficult to do. I would say it was difficult to really get an accurate picture of it without spending a lot of time putting some sort of reflection into it, which is what I did in the first round. But by the second time I didn't have to reflect so much on what the statements meant and what evidence to include since I had already gone through the process.'*

B5, female, leading edge practitioner, UK

### **C) Similarity between frameworks**

This code describes participants' thoughts on the similarity between the two frameworks. The question that elicited this code aimed to explore perceptions about the two frameworks.

All the participants thought the two frameworks were similar

*'... Without being too detailed, I think they were both quite similar in a lot of ways. There was a lot of duplication between them ... generally I would say that the wordings of the framework were quite similar'*

B33, leading edge practitioner, Ireland

*'I found the frameworks to be very similar and didn't really see much difference. I know there was some gaps between doing the two assessments, but I do recall finding them to be similar in terms of wordings and description'*

B50, female, leading edge practitioner, New Zealand

*'I found that the two frameworks were quite similar, I don't think that even one of them showed any difference from the other in many respects'*

A48, experienced practitioner, UK

### **D) Impact and relevance of the framework and self-assessment process**

This code describes participants view about the assessment process. The question that elicited the code aimed to explore general opinion about the two self-assessments.

The interviewees generally had positive opinions about the self-assessment process. They found the assessments to be useful in identifying practice gaps while also providing a road map for practice development.

*'I found the two self-assessments useful in identifying gaps in my practice that may limit my ability to become an advance practitioner. They also pointed out for me areas of advance practice that my current opposition does not offer, example master level competencies and making an impact at a national level.'*

A21, female, leading edge practitioner, Australia

*'It was a useful process because it helped me identify some areas of the areas where I haven't done any particular work for one reason or the other; it gave me ideas about developing my practice in those areas.'*

A48, male, experience practitioner, UK

*'At the end, I found it to be useful. It sort of gives you an overview of where you can go and how you can progress which is good ... I found areas where I was interested in improving, some other areas I was fine with where I was and it wasn't one of my priorities to improve in those areas.'*

A55, male, leading edge practitioner, Australia

*'It made me more conscious and a bit more aware of the things that I was doing. I suppose it gave me a little bit of perspective about where I was and so that was useful. It made me think about the scope or areas that I could be contributing to rather than just the clinical stuffs.'*

A51, female, leading edge practitioner, Australia

Others said it gave them an opportunity to document and put together a practice portfolio.

*'I thought it was a useful process in terms of going through the competencies and thinking about how to put together a portfolio for faculty recognition in UK.'*

B46, male, leading edge practitioner, UK

*'I think it was a helpful exercise, it made me realise I was doing more things than I had perhaps first thought and that to me was more a confirmation of my level of practice, which is helpful for my RPS faculty recognition application.'*

B5, leading edge practitioner, UK

*'I found the framework to be a methodical way to look at a portfolio of professional activity. I don't think I would intuitively look at all the different dimensions and areas that the framework prompted me to do. So I actually found that very constructive and really useful and made me realise the breath of activity and how they could contribute to making me a better practitioner.'*

B33, female, leading edge practitioner, Ireland

One participant indicated working towards developing competence in research as a result of going through the two self-assessments.

*'I think an area I plan to look at in the future is research ... because there was a reasonable chunk of stuffs that were asked in relation to research and I looked at them and found myself going 'I'm not doing that, I'm not doing any of that. I mean with research you always go oh when I get the time, when I get the time; but now I know I actually need to make time to do it.'*

B11, female, leading-edge practitioner, New Zealand

### **4.7.3 Summary of the qualitative interview results**

Less than 50% of the interview participants had formal self-assessment experience prior to the study. Participants indicated that the wordings of the two frameworks were clear and unambiguous. They however expressed difficulty with understanding the requirements for the self-assessment in the first round. These difficulties centered on a lack of understanding of the terminologies and evidence needed to support self-assessment.

The participants further indicated they found the second assessment easier to complete with some participants expressing that they thought this might have been due to the previous exposure to similar competencies in the first self-assessment and the opportunity for reflection this provided.

The study participants also indicated that they found the process of self-assessment to be time consuming but were generally positive about its impact on practice. The positive effects reported included assisting in identifying learning needs and knowledge gaps. They indicated the frameworks clarified the expectations of advance practice with some of the participants reporting plans to undertake specific training in research.

## 4.8 Main Study Findings

This overall goal of this study was to identify and evaluate advanced practice competencies in a global context. An initial literature review (conducted in stage 1 of this study) identified two advanced pharmacy frameworks: the RPS-APF (UK) and the APPF (Australia). These frameworks contained advanced pharmacy competencies adapted to practice in the United Kingdom and Australia respectively.

Content analysis showed that the two frameworks had similar layout with the competencies and behaviours grouped under specific cluster themes (hereafter referred to as clusters) and across three distinct levels of advanced practice. In total, sixty-four advanced pharmacy competencies and 237 behaviours were identified from the two frameworks. Thirty of these competencies and 114 behaviours were from the APPF while the RPS-APF contained 34 competencies and 123 behaviours.

Content mapping of the two frameworks carried out in stage 2 of this study aimed to determine the competencies and corresponding behaviours common to the frameworks. The mapping exercise produced 30 pairs of competencies and 114 behavioural adjacencies. Specific semantic differences were observed and highlighted in the competency pairs and behavioural adjacencies. Five competency pairs contained competencies that were identical in their labels while semantic differences were observed in 25 (83%). Eleven (9.7%) of the behavioural adjacencies also contained behaviours that were identical in description while semantic differences were observed in 103 (90.3%).

Consensus developed via a pragmatic approach to consensus building (conducted in stage 3) showed that despite the semantic differences between the two frameworks, 102 (89.5%) of the behavioural adjacencies formed from the content mapping comprised behaviours that were broadly similar. A crossover mapping experiment designed to evaluate the functional equivalence of the two frameworks (Stage 4) showed direct observed agreement between perceived levels of competence for matching competencies. Agreement of 50% and above was observed in 26 (86.7%) of the competencies identified from the frameworks. The lowest agreement (43%) was in the 'national priorities' competency while the highest (86%) was in the 'reasoning & judgement' competency.

The Kappa statistic values showed less than excellent agreement in all 30 competencies, although, none had  $k$ -values less than 0.10. Slight to weak agreement ( $0.10 < K < 0.41$ ) was

observed in 57% of the competencies while moderate to substantial agreement ( $0.40 < k < 0.81$ ) was observed in 43%. Further evaluation using the Wilcoxon signed-rank test showed no within-subject difference between perceived levels of competence for the competencies in five clusters. A difference was however observed in the collaborative practice cluster and this was within the 'team work' competency. Cramer's  $V$  measure of association showed moderate, strong and perfect association between perceived levels of practice for 87% of the competencies. This suggests that the ranking of a competency in one framework was predictive of the ranking of the matching competency in the second framework for the entire sample for majority of the competencies (87%).

However, comparison of the  $V$  values produced for the three main country groups in the study showed that Australia and New Zealand were less consistent in the ranking of competencies compared to the UK group. The New Zealand group showed a weak association for the 'motivation' competency ( $V=0.28$ ); while the Australia group showed no association in the 'strategic context and strategic planning' competency ( $V \leq 0$ ) and a weak association in the 'national priorities' and 'managing risk' competencies ( $V \leq 0.20$ ). The UK group on the other hand showed an association for all the competencies evaluated.

Disparity in the evidence used to support self-assessment was observed between the three levels of advanced practitioners. The results show that leading edge practitioners are more likely to be members of international, or regional committees, and are more likely to be involved in research. This is in contrast to the experienced practitioners that were mostly involved in staff management and in education and teaching roles. Specialist-in-training were generally least likely to be involved in research, management or leadership roles. They also were generally unable to provide evidence in support of their assessment.

The semi-structured interviews conducted in the study demonstrated that the participants viewed the two frameworks as similar in content and description of competencies and behaviours. They also reported that the two self-assessments were useful in clarifying the expectations of advanced pharmacy practice, identifying gaps in practice and developing learning plans.

The findings of the content analysis, expert panel review and consensus, and the crossover experiment suggest agreement and similarity between the advanced practice behaviours and

competencies in the two frameworks. It also underscores self-assessment as an important attribute of performance management in pharmacy practice.

Full discussion of the study findings is provided in the Discussion section of this chapter (4.9).

## **4.9 Discussion**

### **4.9.1 Methodology**

A combination of a global survey of pharmacy organisations, systematic literature review and framework mapping via qualitative content analysis was used to identify the advanced pharmacy practice competencies in this study. Consensus developed via a pragmatic consensus building process involving a panel of experts and a crossover mapping experiment was used to evaluate the identified competencies. Qualitative interviews of the crossover experiment participants were conducted to obtain pharmacists' inputs about the framework by virtue of their professional roles as advanced practitioners in their respective countries.

These methods were chosen based on evidence from published literature that show that pharmacy practice competencies are identified via a combination of systematic literature reviews and framework mapping using the content analysis technique (Pharmacy Council of New Zealand, 2011; Rutter et al., 2012; Thai Pharmacy Council, 2002; The Pharmaceutical Society of Ireland, 2013), and also evaluated via consensus and professional wide consultation involving self-assessment (Jones et al., 2012; Kennie-Kaulbach et al., 2012; Obiols, 2008).

However, the reliability and reproducibility of the outcome of a content analysis may be limited due to the highly subjective nature of a content analysis technique (Graneheim and Lundman, 2004; Hsieh and Shannon, 2005; Krippendorff, 2013). Nonetheless, the qualitative content analysis conducted in this research was undertaken systematically according to the method outlined by Krippendorff (2013). It was conducted using the semantic description of each of the elements in the two frameworks while a panel of expert further reviewed the outcome of the content analysis, and interpreted and developed consensus on the meaning of the semantic differences observed. This design was used in order to limit the subjectivity associated with the technique and assure the reproducibility of the study findings.

A convenience sample of experts was used in developing consensus in stage 3 of this study. This was done due to cost constraints and limited time available for the research which precluded the use of a Delphi or consensus development panel technique. The panel comprised 14 experts from hospital, academic, regulatory and administrative pharmacy. Though attempts were made to obtain representation from all areas of pharmacy; industrial,



pharmacy information, and military & emergency areas of practice were not represented in the panel.

Since the panel meeting was conducted during the 2013 FIP annual conference of pharmacists and pharmaceutical scientists that held in Dublin, it meant that only experts who planned to attend the conference were able to participate in the meeting. Though the Delphi technique would have circumvented the difficulty associated with organising a face-to-face panel meeting due to the geographical location of the experts; the longer time required for organising and collating the results in the various rounds in a Delphi method made this approach impractical. Furthermore, the face-to-face meeting provided an opportunity to obtain further insight and data from group discussion in the panel. This approach was used based on evidence from published research that show that a modified nominal group and Delphi technique is a pragmatic and evidence-based methodology for developing consensus in pharmacy practice research (McMillan et al., 2016).

Carryover effect is a major limitation of crossover studies (Jones and Kenward, 2003; Mills et al., 2009). Evidence from this study suggests exposure to the framework in the first assessment may have influenced self-assessed level of competence in the second assessment. However, challenges with obtaining a ‘matched pair’ sample made the crossover design more practical. Moreover, the crossover study design used also ensured that the study participants served as their own control, thereby limiting within-subject and within-group variability. Also, the findings of the qualitative interviews conducted in this research show that though the crossover effect may have provided an opportunity for reflection and so likely contributing to an increased self-awareness of gaps in practice; this did not result in a significant difference in individual assessment of matching competencies.

The participant recruitment method is another source of potential bias in this study, particularly because the participants were self-selected. Studies show that self-selected participants are likely to be more intrinsically motivated than the general population (Olsen, 2008). This recruitment method was however chosen to increase the chances of including participants from different practice areas in the study, although at the end of the study, the sample composition showed that majority of the study participants were in hospital practice.

The crossover mapping experiment required the study participants to self-assess their practice using the two identified advanced pharmacy frameworks: the RPS-APF (UK) and the APPF

(Australia). Ranking of individual practice on the continuum of advanced practice delineated in the two frameworks was used as a proxy measure of the applicability to practice of the advanced pharmacy competencies identified. This means applicability of the two frameworks was evaluated implicitly in the crossover study. Feedback from some of the practitioners indicated this design was not ideal given that the self-assessment documents, which were wholly reproduced from the respective frameworks (Appendix 12 & 13), should have been edited to include a 'not applicable' column for practitioners to indicate when they thought a competency was not applicable to their practice. A comment from one of the participants captures this point: *'the big confusion was around what to do when I thought I was below stage 1 on some competencies. Should I have selected stage 1 or leave all three boxes un-ticked? There was no option of 'not applicable' or 'basic'. I felt at times that the tool assumed all pharmacists with several years of experience will fit into one category for all the competencies....'*

Also, the design of the crossover mapping experiment assumed that a change in self-assessed level of competence for a pair of matching competencies would be reflective of a difference between the two frameworks. The findings of this research indicate that while some of the participants of the crossover study may have been self-aware of their competence prior to the study (in light of the higher consistency in ranking observed in the UK and Australia group for most of the competencies); the three months washout period used in this study might have been too long. This is particularly important in light of evidence from the study by Goldsmith et al., (2001), which demonstrated an observable change in pharmacists' performance within three months of the use of a competency framework to identify gaps in practice. Therefore, the three-months washout period used in this study likely provided ample opportunity for further reflection and for some of the study participants to seek out new learning activities.

Kappa statistics was used as a measure of chance-corrected intra-observer agreement. Paired data used in this research violates the assumption of independence for Chi-square related statistics like Kappa. However, mathematical modelling by Gwet (2007) show the Kappa-statistics can be used for paired data and informed the decision to use this analytical method.

Self-assessed level of practice was used as proxy measure of competence and actual performance in this study. However, evidence from published literature show that cognition does not always predict performance or behaviour (Cuthbert et al., 1999; Young et al., 2000). This feature likely affects the reproducibility of some of the findings of this study.

Furthermore, other studies have also demonstrate inconsistencies in self-assessed level of competence and actual abilities (Hodges et al., 2001; Regehr et al., 1996; While, 1994). Published studies show that highly skilled practitioners tend to underestimate their abilities while low skilled practitioners overestimate their abilities. This feature was observed in this research, although the change was not statistically significant.

#### **4.9.2 Content equivalence between the RPS-APF and APPF competency frameworks**

The two frameworks contained advanced pharmacy practice competencies that were described under cluster headings and across three distinct levels of practice. Consensus obtained in stage 3 of the study suggests that the RPS-APF contained 102 behaviours that were similar to matching behaviours in the APPF, and vice versa. These similar behaviours were from 23 (77%) of the 30 competency pairs identified from the two frameworks. Experts comments indicated the differences observed between the remaining behaviours was due to disparity in complexity of the behaviours described in the two frameworks.

For example, the following expert comments were made in relation to a behavioural adjacency formed under the 'expert skills and expertise' competency theme: *'the two behaviours are dissimilar. Demonstrating accountability is different from accepting accountability, as it is possible to accept accountability without necessarily demonstrating it'*. This comment was made with respect to the behavioural adjacency “demonstrates accountability for the delivery of professional services and expertise via a team or directly to groups of patients/clients/users” **AND** “Accepts accountability for patient care services delivered directly to a defined patient group”.

The disagreement on similarity was mainly under the 'expertise and expert skills' competency theme. This is likely due to the fact that this competency was adapted to patient care in the APPF (Australia) in contrast to the RPS-APF (UK), which described the competency broadly with reference to all areas of pharmacy practice.

Overall, the expert review indicates that 90% of content of the two frameworks were similar. This is in line with evidence from the research on foundation level pharmacy practice competencies conducted by Bruno, (2011). It is also in line with evidence form published studies that have shown the applicability to practice of a competency framework adapted to country-specific needs. For example, a study by Rutter et al., (2012) demonstrate the applicability of a competency framework developed with the aid of the General Level

Framework (now the RPS-FLF of the United Kingdom) for pharmacy practice in Singapore (Rutter et al., 2012). Similar findings were demonstrated by Svetlana et al., (2014), which showed the applicability of a competency framework, developed with the aid of the General Level Framework (UK), for pharmacy practice in Serbia. It is also in line with the study by Carrington et al., (2011) which demonstrates the applicability of a competency framework, developed with the aid of the Advance to Consultant Level Framework (now the RPS-APF), for oncology pharmacy practice in Australia.

#### **4.9.3 Functional equivalence between the RPS-APF and APPF competency frameworks**

The crossover mapping experiment conducted in stage 4 of this study was designed to evaluate the functional equivalence of the two advanced pharmacy frameworks identified from the literature review. Functional equivalence was assessed by evaluating the:

- Within-subject agreement between ranking of matching competencies; and
- Association between within-subject rankings of the competencies.

Direct observed agreement showed that the lowest agreement was in the 'national priorities' competency (43%) while the highest agreement was in the 'reasoning & judgement' competency (86%). Agreement of 50% (or more) was observed in 26 (87%) of the competencies in the frameworks. Evidence show that assessing direct percentage agreement can be misleading particularly because it does not account for the probability of chance agreement (Cohen, 1960; Viera and Garrett, 2005). Consequently, within-subject agreement was further evaluated using the chance–corrected measure of agreement: the Kappa ( $k$ ) statistic.

The  $k$ -values derived from the analysis was indicative of chance–corrected agreement ranging from weak agreement ( $k=0.13$ ) in the 'governance' competency to substantial agreement ( $k=0.73$ ) in the 'reasoning & judgement' competency. This means the chance-corrected agreement in the framework ranged from as low as 13% in the 'governance' competency to as high as 73% in the 'reasoning and judgment' competency. These values also indicated *slight to fair* within-subject agreement ( $0.21 < k < 0.41$ ) for majority of the competencies (57%) in the framework with none of the competencies showing excellent agreement. It indicated the chance-corrected agreement in most of the competencies was 21% to 40%, in contrast to the

direct observed agreement of 50% and above obtained for majority of the competencies (87%) in the framework. The disparity between chance-corrected agreement and the direct percentage agreement can be explained by evidence from the published literature that demonstrates that the  $k$ -statistic underestimates agreement (Cicchetti and Feinstein, 1990; Feinstein and Cicchetti, 1990). This therefore accounts for the low agreement indicated by the  $k$ -values.

Since none of the competency showed excellent or perfect agreement (as indicated by the  $k$ -statistic values), the Wilcoxon signed-ranked test was used to further evaluate within-subject difference in ranking. The result of this inferential test showed there was no statistical significant within-subject difference in ranking for all but one competency in the frameworks. The observed difference in within-subject ranking was under the 'teamwork' competency (median rank 1<sup>st</sup>-2<sup>nd</sup> assessment: 4–5; maximum cluster score attainable=6;  $p=0.043$ ). Further evaluation showed that the inconsistency was from the UK and New Zealand country groups, although the disparity was not statistically significant within the country groups [UK:  $p=0.131$ ; New Zealand:  $p=0.176$ ]. Even though these inconsistencies in ranking were not statistically significant, it does suggest that participants generally underestimated their competence in the first assessment. This is further highlighted by the slight inconsistencies in ranking observed in other clusters including leadership (median rank 1<sup>st</sup>- 2<sup>nd</sup> assessment: 13–14; maximum cluster score attainable = 15;  $p=0.370$ ); management (median rank 1<sup>st</sup>- 2<sup>nd</sup> assessment: 18.5–19.5; maximum cluster score attainable= 24;  $p=0.231$ ); and research & evaluation (median rank 1<sup>st</sup>- 2<sup>nd</sup> assessment: 13–13.5; maximum cluster score attainable = 18;  $p=0.143$ ).

These inconsistencies are likely due to the fact that more than half of the study participants did not have any formal self-assessment experience prior to the study. These participants were also not familiar with either of the two frameworks used in the crossover study. This unfamiliarity with the framework or with the self-assessment process was also evident from the interview with some of the study participants indicating they initially found the framework difficult to use in the first round. Comments from participants in group A and B obtained in the interview suggests that the difficulty was not related to the particular framework used in the first assessment. Examples of comments that showed this include: *'I felt a bit lost the first time; I thought it was a bit difficult to comprehend. But by the second time I was quite familiar with the logic of the framework and knew what to do'* (Group A

participant), and *'When I first saw the framework, I thought wow ... it felt a little bit overwhelming but when I read through the instructions and gave myself time to reflect, I felt more comfortable...'* (Group B participant).

This suggests that familiarity with the self-assessment process in the first round may have increased self-confidence and in so doing aided more accurate individual assessment of competence by the second round. This finding is in line with evidence from a study by Fitzgerald et al., (2003) which showed that self-assessment accuracy is influenced by task familiarity. However, this is in contrast to evidence from a study by Kruger and Dunning (1999) which showed that learners tend to overestimate their abilities, although, the authors also found that this overestimation was generally attenuated by further training and increased self-awareness of gaps in practice. On the other hand, the inconsistencies in ranking observed in this study may also indicate a change in perceived level of competence. Since the observed change showed that the participants ranked their practice higher in the second assessment, it is possible that the opportunity for reflection provided by the first assessment may have heightened self-awareness of depth and limitation of practice. Evidence from the qualitative interviews suggests this may have been the case for some of the participants. For instance a comment from a participant shows this: *'I had an incidence the other day involving a work colleague (...) in the end I found myself thinking that may be I had underestimated my competence. I found myself thinking that may be if I actually searched through my hard drive and found everything I have done, may be I would have more evidence than I gave myself credit for....'*

The observed change in ranking may have also been potentiated by the *carryover effect* inherent in crossover studies (Jones and Kenward, 2003; Mills et al., 2009). This is in line with evidence from the study by Brown et al., (2015), which demonstrated improvement understanding and greater confidence in perceived level of competence after a four-day competency-based training workshop involving a group of health professionals.

In spite of the observed inconsistencies, Cramer's V values obtained in the study showed moderate, strong and perfect associations in within-subject ranking for majority of the competencies (87%). This included the 'teamwork' competency that showed a statistically significant difference in ranking of competence. The Cramer's V values obtained suggest that the competency ranking of the first assessment was predictive of the ranking in the second assessment.

The Australia and New Zealand were less consistent in the ranking of competencies compared to the UK. The UK group showed an association for all the competencies evaluated and this may be due to the fact that the members of this group were more likely to have had prior experience with self-assessment as indicated by the outcome of the interviews, particularly because the United Kingdom pioneered the use of the RPS-APF developmental framework for evaluation of competence through self-assessment for pharmacists (Davies et al., 2002; Modernising Pharmacy Career Programme, 2012; Royal Pharmaceutical Society of Great Britain, 2013b, 2003b) via the work of the Competency Development Group [CoDEG].

Overall, the study result indicates minimal disparity between the competencies in the two frameworks and this is in line with evidence from the studies included in the literature review reported in Chapter 2 of this thesis that have demonstrated similarity between countries with respect to applicability to practice of identified competencies. For example, studies by Meštrović et al., 2012 (Croatia), Svetlana et al., 2014 (Serbia), Coombes et al., 2010 (Australia), and Rutter et al., 2012 (Singapore), demonstrates the existence of a common set of pharmacy practice competencies that are applicable to practitioners in these different countries. It corroborates evidence from the study by Bruno (2011), which showed that the competencies in the FIP Global Competency Framework are applicable to pharmacists in 64 countries.

Evaluation of the evidence used to support self-assessment demonstrates the two frameworks are capable of differentiating between the three distinct levels of advanced pharmacy practice. Leading-edge practitioners— which correspond to the highest level of advanced pharmacy practice— were more likely to be members of regional, national or international advisory committees. They were also more actively involved in research, and leadership roles at regional and international levels. Experienced practitioners on the other hand were more involved in staff management but were not likely to be involved in leadership or actively participating in research. Specialists-in-training were generally unable to support their self-assessment with any of the evidence provided. They used the 'other documentation' evidence category: a feature that is in line with the practice profile expected of this group, as shown by evidence in the study by Obiols (2008). It is also in line with the practice profile expected of the different levels of advanced practitioner (The Advanced Pharmacy Practice Framework Steering Committee (APPFSC), 2012, p. 11). The overall finding of this study suggests the

existence of a set of advanced pharmacy practice competencies that are applicable to practitioners from the countries represented.

#### **4.10 Study Limitations**

In addition to the potential limitations discussed above, this study has a number of potential sources of bias:

- The convenience sample of experts used to develop consensus in stage 3 of this study is a potential source of bias. Conducting the face-to-face panel meeting during the 2013 FIP conference meant that only the experts attending the conference were able to participate. It also meant that expert pharmacists from countries or pharmacy organisations not affiliated with FIP were excluded. As a result, the external validity of this study finding beyond the countries represented may be limited.
- The panel proceedings and discussion was conducted in English language. This therefore excluded potential respondents from non-Anglophone countries that may otherwise have been interested in participating, thereby biasing the results and limiting the generalisability of these findings to these countries.
- The sample size in the crossover mapping experiment is a potential source of bias. The majority (42/45, 93%) of the crossover study participants were in hospital practice with only one participant in community and academic practice. The study also had a limited number of countries represented. Consequently, further research involving advanced practitioners from more countries is required.
- Furthermore, the crossover study participants were self-selected. As a result, it is possible that the findings of this research may have limited external validity to advanced practitioners that are less motivated to improve their practice compared to the study participants.
- The two frameworks used in this study were developed via similar bibliographic sources. As such, this biases the interpretation of the study findings that show similarity in competencies and behaviours between the frameworks.



## Chapter 5 CONCLUSION

Health workforce quality influences health system performance. It plays a key role in the attainment of universal health coverage and equitable access to essential health services. Some of the strategies for improving health workforce quality include rapid workforce expansion in terms of increasing and sustaining the numbers of health workers and strengthening workforce capacity via education, training and developmental (World Health Organization, 2013, 2007).

In recent years, health professional education has undergone some innovations, one of which has been the adoption of the competency-based education and training (CBET) model for both undergraduate and practicing health professionals. Although CBET has been widely used in teacher education since the mid-1960's in USA (McCowan, 1998), and in vocational education & training (VTE) in Europe since the mid 1980's (Winterton et al., 2006); its use in health professional education has only been actively promoted and implemented in recent years (Bates and Bruno, 2008; Frenk et al., 2010; Gruppen et al., 2012; *The Draft CanMEDS 2015 Physician Competency Framework - Series IV*, 2015; World Health Organization, 2013).

A key attribute of the CBET model is the identification of the competencies required for effective, safe and consistent performance within the limit of professional practice (Brownie et al., 2011a). A compilation of these competencies produces a competency framework that is used to design education & training curricular, define scope of practice, regulate career entry and support expertise development (Brownie et al., 2011a).

The systematic literature review presented in chapter 2 provides evidence of the usefulness of competency frameworks. Evidence from the studies included in the review in chapter 2 of this thesis show that when competency frameworks are used alongside practice standards, it helps improve pharmacists' performance, supports the attainment and maintenance of competence, promotes consistency of practice and fosters professional development (Antoniou et al., 2004; Austin et al., 2004, 2004; Brownie et al., 2011a; Coombes et al., 2011; Mills et al., 2005).

In line with evidence, the two studies reported in this thesis aimed to identify and evaluate the competencies that are essential for global foundation and advanced pharmacy practice. This

chapter will discuss the overall implication for practice of the findings of this research and would provide recommendation for future research.

Overall, the two studies reported in this research evaluated pharmacy practice competency frameworks. While the first study evaluated the FIP global competency framework for foundation level practice focusing regionally in Africa, the second study evaluated two national advanced pharmacy practice frameworks in a global context. The two studies aimed to answer two main questions:

1. Are the competencies and behaviours in the FIP Global Competency Framework (GbCF v1) relevant to pharmacy practice in countries in Africa?
2. Are there core competencies for advanced pharmacy practice?
  - a. If so, would such competencies be applicable to advanced practitioners from different countries?
  - b. Can a global competency framework for advanced pharmacy practice be developed from these competencies?

The findings of the first study involving the evaluation of the FIP Global Competency Framework (GbCF v1) (reported in chapter 3) show that the competencies contained in the framework are broadly applicable to pharmacy practice in four countries in Africa. It demonstrates that 90% of the GbCF v1 behaviours are essential for pharmacy practice in Nigeria, Ghana, Kenya and South Africa. It provides evidence of the applicability of these competencies for foundation level pharmacy practice in these countries although, with some specific inter-nation differences for seven of the GbCF v1 behaviours. Data from the study was not conclusive for ten of the African countries represented in the survey. These countries included Tanzania, Sudan, Uganda, Zambia, Zimbabwe, Egypt, Ethiopia, Lesotho, Namibia and Tunisia. However, the homogeneity of the survey responses obtained for all the 14 countries represented suggest that the overall findings of this study may likely be generalisable.

The results of the second study (chapter 4) demonstrate the existence of a set of pharmacy practice competencies that are relevant for advanced pharmacy practice in different countries. It provides preliminary evidence of the applicability of these competencies to a group of advanced practitioners from three of the countries represented and these were United

Kingdom, New Zealand and Australia. Evidence of the applicability of these competencies to practice in Ireland was inconclusive given that only one participant from the country was represented in the sample. Overall, due to limited number of countries represented, it is not possible to conclude that a global framework for advanced pharmacy practice has been or can be developed (based on data obtained in this thesis) and so further research is required.

The findings of these two studies corroborate evidence of the existence of a set of competencies that are relevant for pharmacy practice in different countries (Bruno, 2011). These findings are also in consonance with similar evidence from the field of medicine that demonstrates cross-national applicability of the Canadian CanMEDS Physician Competency Framework to medical practice in Netherlands (Scheele et al., 2008), Denmark (Danish Health and Medicines Authority, 2014; Ringsted et al., 2006) and Australia (The Royal Australian and New Zealand College of Psychiatrists, 2012).

These findings therefore have a number of implications for pharmacy practice. The results of the study reported in Chapter 3 validates the FIP Global Competency Framework (GbCF v1) as a mapping tool that can be used to develop country-specific frameworks in some African countries. It provides evidence of the potential applicability of the framework to pharmacy practice in four countries in Africa: Nigeria, Ghana, Kenya and South Africa. It also provides evidence that was previously lacking on the relevance of these competencies in these countries while also demonstrating the feasibility of adapting the GbCF v1 framework to developing country-specific frameworks for pharmacy practice in these countries.

Of particular interest is the finding that a high percentage of community pharmacists from the countries represented in the online survey indicated that the B13 (document and act upon dispensing errors) and B14 (implement and maintain a dispensing error report system and a near miss report system) behaviours were not relevant for their practice. This suggests community pharmacy respondents from these countries do not routinely carry out these activities although this may have been due to the response rate and/or that the pharmacists were self selecting. Nonetheless, this finding underscores the need to review current practice and incorporate robust dispensing processes in community practice that incorporate oversight functions by pharmacists in these countries. This should assure patient safety while also providing an avenue for prompt identification and action on potential medication errors.

Data from the study reported in Chapter 4 provide preliminary evidence of the existence and applicability to practice of the advanced pharmacy practice competencies contained in the RPS-APF and the Australian APPF. In light of similar evidence from other studies (Rutter et al., 2012; Bruno (2011); Svetlana et al., 2014; Carrington et al., 2012; Brown et al., 2012); these results suggests that the two advanced pharmacy frameworks evaluated in this study can be used as mapping tools for the development of other country-specific frameworks. It also suggests that the 30 broad competencies identified from the two frameworks can be compiled and further evaluated and validated through larger scale research studies involving advanced practitioners from more countries.

The availability of a validated set of competencies for global pharmacy practice can provide an avenue for guidance on the expectations of practice. This will ensure shared understanding of the requirement of pharmacy practice between countries while also facilitating the definition of professional standards. From a leadership perspective, it can help facilitate the articulation of harmonised standards that can become aspirational for advanced practitioners at an individual level, and for national leadership bodies at an organisational level. The availability of harmonised standards for global pharmacy practice can assist the global quality assurance process by facilitating comparability of professional practice between countries, and in so doing promote parity in standards of care and aid skill mobility.

The results of the crossover mapping experiment reported in chapter 4 indicate that pharmacists likely underestimated their competence in the first assessment. This suggests an initial lack of self-awareness of the breadth and depth of practice prior to exposure to the framework. This was in tandem with the results from the qualitative interview that also indicated that the opportunity for reflection and exposure to the competencies in the framework used for first self-assessment likely aided accurate assessment of competence with the second framework. This finding emphasises the need to promote reflective practice and routine self-assessment for pharmacy practitioners. This would potentially ensure that pharmacists are continuously self-aware of their capabilities and thereby provide the motivation and confidence needed to take on more responsibilities, ultimately aiding the efficient use of available skills. It would also facilitate self-awareness of gaps in practice and so facilitate self-directed learning for continuous professional development.

The findings of the two studies reported in this thesis showed that pharmacists considered the research-related competencies to be of low relevance to practice. This suggests that involvement in research is likely to be limited for the pharmacists that participated in the two studies. Since the studies included international pharmacists from different areas of pharmacy practice and with differing length of practice experience, the finding highlights the need to build research capacity in pharmacy globally. This is of particular importance in view of the changing healthcare environment where new and individualised therapies, technological advancements, and the aging population demand complex and evidenced-based pharmaceutical care services that optimise patient outcomes. As a result, high quality research studies designed to evaluate the effectiveness of novel drug products or pharmaceutical care strategies will need to be conducted and this would require the availability of trained pharmacists able to take on these responsibilities.

The theory of andragogy posits that self-recognition of knowledge gaps triggers a readiness to learn in adult learners (Knowles, 1980; p.43). It is this self-recognition of practice limitations that motivates adult learners. The theory also asserts that adults would be more willing to learn when their learning activities are organised around areas that are immediately relevant to solving real life problems. This means that incorporating the identified pharmacy practice competencies shown to be relevant to practice into the learning activities of pharmacy practitioners would likely motivate and trigger a readiness and willingness to learn. This would potentially promote lifelong learning and ensure that pharmacy practitioners are capable, competent and continuously fit for practice.

## **5.1 Innovation in this research**

A pragmatic approach to consensus building was used in stage 3 of the advanced pharmacy practice study reported in chapter 4. This involved a combination of a modified Delphi and nominal group technique involving a panel of experts. This approach enabled the inclusion of expert practitioners that otherwise would not have participated because they did not plan to attend the FIP conference where the face-to-face panel meeting was conducted. The choice of the 2013 FIP annual conference of pharmacists and pharmaceutical scientists which held at Dublin as a venue for the conduct of the panel meeting provided an opportunity for the inclusion of international experts.

Social media was actively used to raise awareness for the first study reported in this research. In using this approach, the survey invite containing the URL was disseminated using Facebook®, Twitter® and Blackberry Messenger® social media platforms. This information dissemination strategy proved useful for raising awareness and reaching pharmacists in different countries and should be considered for use in future research involving online surveys in pharmacy practice.

The applicability and functional equivalence of two advanced pharmacy practice frameworks was evaluated in the second study via a crossover mapping experiment [reported in Chapter 4 of this thesis]. This circumvented the need to recruit matched pairs of practitioners from the different countries. It also provides evidence of the feasibility of using this design in framework mapping and in the comparative evaluation of the applicability to practice of the identified competencies and could be useful for organisations and countries interested in developing specific frameworks.

## **5.2 Future Research**

The study reported in Chapter 3 of this thesis has demonstrated the validity of the GbCF v1 framework in four countries in Africa, based on the responding pharmacists. Further work is now necessary with respect to obtaining stakeholders' and expert opinion on the relevance of these competencies in these countries. This would provide an opportunity for advocacy as well as a means for obtaining 'buy in' from policy makers and key persons of influence in the countries.

The validity of the competencies in other countries in the region, particularly non-Anglophone countries, would need to be evaluated in future research. This is to enable further compilation of evidence of validity of the framework in this region. This means that further work will need to be done in translation of the GbCF v1 to the other languages used in the region. For instance, French is the dominant language used in 16 of the eighteen countries in West Africa while Arabic is the main language in all the seven countries in North Africa. Furthermore, a larger scale validation study is necessary in order to obtain inputs from practitioners in non-patient facing roles like industrial, administrative and academic pharmacy who practice in this region. This will ensure that evidence on the validity of the framework in these areas is obtained and possibly provide an opportunity for feedback and review of these draft competencies in relation to these specific areas of practice.

Further work is also necessary to evaluate the applicability to practice of the 30 broad advanced pharmacy competencies identified in this research. Future research would need to include a larger cohort of advanced pharmacy practitioners than was obtained in this research. It would also need to include advanced practitioners from other countries and other practice areas like community, academic and industrial pharmacy to ensure availability of robust evidence from these groups. Furthermore, majority of the crossover study participants were leading edge practitioners (57%), as such research involving a larger cohort with more representatives from the experienced and specialists-in-training cadre of practice is necessary.

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## Appendix 1: Survey Invitation Email



International Pharmaceutical Federation

21 November 2012

### Validation of the GbCF v1 in an African context

Dear colleagues,

Please find below an invitation to take part in an ongoing online survey of the FIPEd Development Team.

The competency project team of the FIPEd Development Team has been gathering competency frameworks, documents and standards for pharmaceutical services from across the world. Many of you have contributed to this process and the team offers sincere thanks for this.

The collected frameworks have been synthesised into a Global Competency Framework (GbCF) v1 for the provision of pharmaceutical services. Ideally, this global framework could then be adapted for use at the country level.

The GbCF contains a core set of behavioural competencies which should be generally applicable for the pharmacy workforce worldwide. It has been through a process of consensus group meetings, content validation meetings and an iterative content phase to reach this stage.

For the next stage, we need the input of pharmacists regardless of area of practice in vetting this framework to ensure it will meet our general needs. The purpose of the input is to evaluate the relevance and validity of the current version, especially in an African context.

For this reason, we would greatly appreciate it if you would use the following link to respond to an [online survey](#) and forward to your colleagues as you see fit.

Please note the linked version of the document version 1 and will undergo further revisions once we have collected your input.

A document has been developed which contains more information about the development of the GbCF v1, a glossary and an evidence and references guide to the documentation used for the development of the document. The document is available to download [here](#). Or you can go to our website to find out more: [www.fip.org/education\\_taskforce](http://www.fip.org/education_taskforce).

If you have further comments and suggestions or if you have any queries, contact Andreia Bruno at [education@fip.org](mailto:education@fip.org).

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## Appendix 2: Survey Invitation Flyer



### *Validation of the FIP Global Competency Framework (GbCF v1) in Countries in Africa*

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Dear Pharmacist,

The Development Team of the FIP Education Initiative, *FIPEd*, invites you to participate in an on-going survey of pharmacists practising in Africa. The overall goal of the study is to evaluate foundation level pharmacy practice in countries in Africa using the global competency framework (GbCF v1).

The project aims to obtain inputs from pharmacists about the competencies contained in the FIP global competency framework, version 1 (GbCF v1).

The questionnaire can be completed online on any internet-enabled mobile device or PC. Responses to the survey are uploaded directly on to the FIP database upon submission.

If you require further information or should you have any questions, please contact:

Miss Arit Udoh, Research Associate, *FIPEd*, [arit.udoh.11@ucl.ac.uk](mailto:arit.udoh.11@ucl.ac.uk)

Dr Andreia Bruno, Project Co-ordinator, *FIPEd*, [education@fip.org](mailto:education@fip.org)

### Appendix 3: List of FIP Member Organisations in Africa

S/N	Organisation	Country
1.	Pharmacy Council of Ghana	Ghana
2.	Pharmaceutical Society of Kenya	Kenya
3.	Ordre National des Pharmaciens de Madagascar	Madagascar
4.	Pharmaceutical Association of Mauritius	Mauritius
5.	Conseil Regional des Pharmaciens d'officine du Nord	Morocco
6.	Conseil National de l'ordre des Pharmaciens du Mali	Mali
7.	Pharmaceutical Society of Nigeria	Nigeria
8.	Rwanda Pharmacists Association	Rwanda
9.	Ordre National des Pharmaciens du Senegal	Senegal
10.	Pharmaceutical Society of South Africa	South Africa
11.	Sudanese Pharmacists Union	Sudan
12.	Pharmaceutical society of Uganda	Uganda
13.	Pharmaceutical Society of Zambia	Zambia
14.	Pharmaceutical Society of Zimbabwe	Zimbabwe
15.	Ordre National des Pharmaciens du Burkina Faso	Burkina Faso
16.	Conseil National de L'ordre des Pharmaciens du Cameroun	Cameroun
17.	Ordre National des Pharmaciens du Tchad N'Djamena	Chad
18.	Comseil National de l'ordre des Pharmaciens du Congo	Congo
19.	Pharmaceutical Society of Egypt	Egypt
20.	Syndicate of Pharmacists in Arab Republic of Egypt	Egypt
21.	Eritean Pharmaceutical Association	Eritea
22.	Ethiopian Pharmaceutical Association	Ethiopia
23.	Conseil National de l'ordre des Pharmaciens de Guinea Conakry	Republic of Guinea
24.	Conseil National de l'ordre des Pharmaciens de Cote d'Ivoire	Cote d'Ivoire

## Appendix 4: Online Forum of Pharmacists Contacted for the Survey

- i. Kenya Medical Practitioners, Pharmacists and Dentists Union (KMPDU) Facebook group available at <https://www.facebook.com/groups/126614676824/>
- ii. PharmacySA Facebook group available at <https://www.facebook.com/groups/pharmacysa/>
- iii. Social Pharmacy Network of Nigeria Facebook group available at <https://www.facebook.com/groups/socialpharmacy/>
- iv. Pharmacy Council of Nigeria Facebook group available at the link <https://www.facebook.com/groups/Epharmacists/>
- v. Pharmacist Action Group of Nigeria Facebook group available at the link <https://www.facebook.com/groups/pagon.nigeria/>
- vi. Pan-African Health Facebook group available at <https://www.facebook.com/groups/511653725535743/>
- vii. Pharmaceutical Society of Zambia, Copperbelt branch Facebook group available at <https://www.facebook.com/groups/185888851441479/?fref=ts>
- viii. The Uganda Community Pharmacists Fraternity available at <https://www.facebook.com/groups/219323064879920/?fref=ts>
- ix. Facebook Pharmacists and Doctors in Uganda <https://www.facebook.com/groups/289641901104874/?fref=ts>
- x. South Africa Pharmacy and Pharmaceutical Personnel Facebook group
- xi. Intern Pharmacy of Ghana Facebook group available at <https://www.facebook.com/groups/272293606223881/>
- xii. SA Pharmacy Today Facebook group available at <https://www.facebook.com/groups/pharmacy2daysa/?fref=ts>

## Appendix 5: Survey Questionnaire

### Development Team

### Competency Development Domain | Validation of the GbCF v1 in an African Context

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#### Global Competency Framework v1

Competent pharmacists have the potential to improve therapeutic outcomes and patients' quality of life. Before competence can be determined, the specific competencies and behaviours that contribute to it must be identified.

The aim of the overall project is to develop a global competency framework (GbCF) that includes behavioural statements, which can be adaptable to local needs and cultural contexts relevant to a global pharmaceutical workforce. This would be consistent with other health professions (eg, physicians) who have achieved a harmonised global consensus about competency.

In the initial phase of the project, documents/frameworks were collected from around the world. Through consultation and review, these have been synthesised into this draft global version. Now we need your feedback about relevance or how well these behavioural statements fit your practice.

As a pharmacist, your contribution is highly valuable, ensuring that the core competencies and behaviours you feel important to your daily work are incorporated in the global competency framework draft version survey. I hereby invite you to share your thoughts.

#### Instructions:

We will now ask you some specific questions about behavioural statements that constitute the provision of pharmaceutical services. The items are divided into four separate clusters: pharmaceutical public health, pharmaceutical care, organisation and management, and professional/personal competencies.

Please think only about your own pharmaceutical practice and then rate each individual behavioural statement as relevant or not relevant to your practice.

Please follow the directions and answer all questions. This is an anonymous, confidential questionnaire; responses will be reported in aggregate and no one respondent will be identifiable. Please answer honestly, reflecting actual practice rather than desired practice.

This questionnaire should take no more than 20 minutes of your time. All contributions are highly valued, and we appreciate your time and effort.

**Many thanks for your contribution.**

For further information or if you have any enquiries about this questionnaire please contact [Andreia Bruno](#) or [Arit Udoh](#).

**Demographic Information:**

**Country of residence:** \_\_\_\_\_

**Years Qualified:** \_\_\_\_\_

**Gender:**  Female

Male

**Current Status:**  Internship (still pre-registration while at university/college)

Pre-registration candidate (not yet registered or licensed)

Licensed/registered pharmacist

**Area of Practice:**  Academic Pharmacy

Administrative Pharmacy

Clinical Biology

Community Pharmacy

Hospital Pharmacy

Industrial Pharmacy

Laboratories and Medicine Control Section

Military and Emergency Pharmacy

Pharmacy Information

Other:

Please think only about your own pharmaceutical practice and then rate each individual behavioural statement as relevant or not relevant to your practice.

1. Pharmaceutical Public Health Competencies						
Competencies	Behaviours	Highly Relevant	Relevant	Low Relevant	Not Relevant	
1.1 Health promotion	1.1.1 Assess the primary healthcare needs (taking into account the cultural and social setting of the patient)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.1.2 Advise on health promotion, disease prevention and control, and healthy lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.2 Medicines information and advice	1.2.1 Counsel population on the safe and rational use of medicines and devices (including the selection, use, contraindications, storage, and side effects of non-prescription and prescription medicines)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.2.2 Identify sources, retrieve, evaluate, organise, assess and disseminate relevant medicines information according to the needs of patients and clients and provide appropriate information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Pharmaceutical Care Competencies						
Competencies	Behaviours	Highly Relevant	Relevant	Low Relevant	Not Relevant	
2.1 Assessment of medicines	2.1.1 Appropriately select medicines (e.g. according to the patient, hospital, government policy, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.1.2 Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.2 Compounding medicines	2.2.1 Prepare pharmaceutical medicines (e.g. extemporaneous, cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.2.2 Compound under the good manufacturing practice for pharmaceutical (GMP) medicines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.3 Dispensing	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments and monitor the dispense (re-checking the medicines)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.3.2 Accurately report defective or substandard medicines to the appropriate authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.3.3 Appropriately validate prescriptions,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	ensuring that prescriptions are correctly interpreted and legal				
	2.3.4 Dispense devices (e.g. Inhaler or a blood glucose meter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3.5 Document and act upon dispensing errors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3.6 Implement and maintain a dispensing error reporting system and a 'near misses' reporting system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3.7 Label the medicines (with the required and appropriate information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3.8 Learn from and act upon previous 'near misses' and 'dispensing errors'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Medicines	2.4.1 Advise patients on proper storage conditions of the medicines and ensure that medicines are stored appropriately (e.g. humidity, temperature, expiry date, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.4.2 Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.4.3 Ensure appropriate medicines, route, time, dose, documentation, action, form and response for individual patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.4.4 Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Monitor medicines therapy	2.5.1 Apply guidelines, medicines formulary system, protocols and treatment pathways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.5.2 Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.5.3 Identify, prioritise and resolve medicines management problems (including errors)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6 Patient consultation and diagnosis	2.6.1 Apply first aid and act upon arranging follow-up care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.6.2 Appropriately refer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.6.3 Assess and diagnose based on objective and subjective measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.6.4 Discuss and agree with the patients the appropriate use of medicines, taking into account patients' preferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.6.5 Document any intervention (e.g. document allergies, medicines and food, in patient medicines history)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.6.6 Obtain, reconcile, review, maintain and update relevant patient medication and diseases history	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Organisation and Management Competencies</b>					



Competencies	Behaviours	Highly Relevant	Relevant	Low Relevant	Not Relevant
3.1 Budget and reimbursement	3.1.1 Acknowledge the organisational structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.1.2 Effectively set and apply budgets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.1.3 Ensure appropriate claim for the reimbursement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.1.4 Ensure financial transparency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.1.5 Ensure proper reference sources for service reimbursement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Human Resources management	3.2.1 Demonstrate organisational and management skills (e.g. know, understand and lead on medicines management; risk management; self management; time management; people management; project management; policy management.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2.2 Identity and manage human resources and staffing issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2.3 Participate, collaborate, advise in therapeutic decision-making and use appropriate referral in a multi-disciplinary team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2.4 Recognise and manage the potential of each member of the staff and utilise systems for performance management (e.g. carry out staff appraisals)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2.5 Recognise the value of the pharmacy team and of a multidisciplinary team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2.6 Support and facilitate staff training and continuing professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Improvement of service	3.3.1 Identify and implement new services (according to local needs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.3.2 Resolve, follow up and prevent medicines related problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 Procurement	3.4.1 Access reliable information and ensure the most cost-effective medicines in the right quantities with the appropriate quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.2 Develop and implement contingency plan for shortages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.3 Efficiently link procurement to formulary, to push/pull system (supply chain management) and payment mechanisms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.4 Ensure there is no conflict of interest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.5 Select reliable supplies of high-quality products (including appropriate selection process, cost effectiveness, timely delivery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.6 Supervise procurement activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4.7 Understand the tendering methods and evaluation of tender bids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5 Supply	3.5.1 Demonstrate knowledge in store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

chain and management	medicines to minimise errors and maximise accuracy				
	3.5.2 Ensure accurate verification of rolling stocks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.5.3 Ensure effective stock management and running of service with the dispensary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.5.4 Ensure logistics of delivery and storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.5.5 Implement a system for documentation and record keeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.5.6 Take responsibility for quantification of forecasting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6 Work place management	3.6.1 Address and manage day to day management issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.6.2 Demonstrate the ability to take accurate and timely decisions and make appropriate judgments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.6.3 Ensure the production schedules are appropriately planned and managed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.6.4 Ensure the work time is appropriately planned and managed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.6.5 Improve and manage the provision of pharmaceutical services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.6.6 Recognise and manage pharmacy resources (e.g. financial, infrastructure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 4. Professional/Personal Competencies

Competencies	Behaviours	Highly Relevant	Relevant	Low Relevant	Not Relevant
4.1 Communication skills	4.1.1 Communicate clearly, precisely and appropriately while being a mentor or tutor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1.2 Communicate effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1.3 Demonstrate cultural awareness and sensitivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1.4 Tailor communications to patient needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1.5 Use appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Continuing Professional Development (CPD)	4.2.1 Document CPD activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.2 Engage with students/interns/residents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.3 Evaluate currency of knowledge and skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.4 Evaluate learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.5 Identify if expertise needed outside the scope of knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.6 Identify learning needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.7 Recognise own limitations and act upon them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2.8 Reflect on performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Legal and regulatory	4.3.1 Apply and understand regulatory affairs and the key aspects of pharmaceutical registration and legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

practice	4.3.2 Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretatio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3.3 Be aware of and identify the new medicines coming to the market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3.4 Comply with legislation for drugs with the potential for abuse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3.5 Demonstrate knowledge in marketing and sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3.6 Engage with health and medicines policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3.7 Understand the steps needed to bring a medicinal product to the market including the safety, quality, efficacy and pharmacoeconomic assessments of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 Professional and ethical practice	4.4.1 Demonstrate awareness of local/national codes of ethics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4.2 Ensure confidentiality (with the patient and other healthcare professionals)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4.3 Obtain patient consent (it can be implicit on occasion)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4.4 Recognise own professional limitations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4.5 Take responsibility for own action and for patient care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Quality Assurance and Research in the work place	4.5.1 Apply research findings and understand the benefit risk (e.g. pre-clinical, clinical trials, experimental clinical-pharmacological research and risk management)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.2 Audit quality of service (ensure that they meet local and national standards and specifications)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.3 Develop and implement Standing Operating Procedures (SOP's)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.4 Ensure appropriate quality control tests are performed and managed appropriately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.5 Ensures medicines are not counterfeit and quality standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.6 Identify and evaluate evidence-base to improve the use of medicines and services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.7 Identify, investigate, conduct, supervise and support research at the workplace (enquiry-driven practice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.8 Implement, conduct and maintain a reporting system of pharmacovigilance (e.g. report Adverse Drug Reactions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5.9 Initiate and implement audit and research activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6 Self-management	4.6.1 Apply assertiveness skills (inspire confidence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6.2 Demonstrate leadership and practice management skills, initiative and efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6.3 Document risk management (e.g. critical incidents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6.4 Ensure punctuality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6.5 Prioritise work and implement innovative ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix 6: Invitation to Participate in a Crossover Mapping Experiment



### *Developing and Evaluating Competencies for Global Advanced Pharmacy Practice: Invitation to Participate*

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6<sup>th</sup> January 2014

Dear Pharmacist,

The Development Team of the FIP Education Initiative (FIPEd) would like to invite you to participate in a study that forms part of a project by the Advanced Practice Domain of FIPEd. The overall goal of the project is to identify and evaluate the core competencies required for global advanced pharmacy practice.

Preliminary studies in this project have identified two national competency frameworks for advanced pharmacy practice: the Royal Pharmaceutical Society Advanced Pharmacy framework (RPS-APF)<sup>1</sup> and the Advanced Pharmacy Practice Framework for Australia (APPF)<sup>2</sup>. An initial mapping of the competencies and behaviours in the APPF against those of RPS-APF has been conducted. The results of this framework mapping were analysed and reviewed by a group of expert pharmacy practitioners and has provided preliminary information on the commonalities existing between the two competency frameworks.

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<sup>1</sup> Royal Pharmaceutical Society, 2013. The RPS Advanced Pharmacy Framework (APF), available at: <https://www.rpharms.com/faculty-documents/rps-advanced-pharmacy-framework-guide.pdf>

<sup>2</sup> The Advanced Pharmacy Framework for Australia, available at <http://www.psa.org.au/download/standards/advanced-pharmacy-practice-framework.pdf>

This current stage of the study builds on these preliminary investigations and aims to test the functional equivalence of the two frameworks. To this end, an assessment of competence using both frameworks in a group of advanced<sup>3</sup> pharmacy practitioners from different countries is proposed.

Study participants will be required to carry out an initial self-assessment using one framework and after a three-month ‘wash-out’ period, carry out another self-assessment using the second framework.

Comparative analysis of the outcomes of self-assessment produced by either framework in the same group of advanced practitioners will provide information on the functional equivalence of the two frameworks.

A briefing document containing further details about the study has been prepared and is attached.

Thank you and we look forward to hear from you.

If you require more information, please contact any of the following persons:

Arit Udoh, [ucnvaud@ucl.ac.uk](mailto:ucnvaud@ucl.ac.uk), Research Associate, FIPed

Dr. Andreia Bruno, [education@fip.org](mailto:education@fip.org), Project Co-ordinator and Researcher, FIPed

Prof. Ian Bates, Director, FIPed Development Team

Ms Kirstie Galbraith, Domain Lead, Advanced Practice Competencies, FIPed.

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<sup>3</sup> Advanced pharmacy practice is practice that is so significantly different from that achieved at initial registration that it warrants recognition by peers of the expertise of the practitioner and the education, training and experience from which that capability was derived.

## Appendix 7: Consent Form



### Practice A Cross-over Trial to Identify and Evaluate Advanced Pharmacy Competencies in a Global Context

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**Researcher(s):** Udoh A., Bruno A., Galbraith K., Bates I.

**Organisation:** FIP Education Initiatives (FIP*Ed*), FIP Collaborating Centre, UCL School of Pharmacy, London, United Kingdom.

1.	I have read and understood the information about the project as provided in the Information documents attached.	<input type="checkbox"/>
2.	I have been given the opportunity to ask questions about the project and my participation.	<input type="checkbox"/>
3.	I agree that I will be required to carry out two self-assessments of competence in this study.	<input type="checkbox"/>
4.	I voluntarily agree to participate in the project.	<input type="checkbox"/>
5.	I understand I can withdraw at any time without giving reasons if I wish to.	<input type="checkbox"/>
6.	I have read and understood the procedures regarding confidentiality in this project.	<input type="checkbox"/>
7.	I, along with the Researcher, agree to sign and date this informed consent form.	<input type="checkbox"/>

I freely give my consent to participate in this research study and have been given a copy of this form for my own information.

Participant's Initials and Signature:

Date:

Researcher's Initials and Signature:

Date:

## **Appendix 8: Reminder Email**

**\*\* Please disregard this email if you have already responded \*\***

Dear Practitioner,

Here is a gentle reminder about completing the self-assessment document for the FIP advanced pharmacy crossover study. We ask you to please return the completed document using this medium.

We thank you in advance for considering this request and would like to reassure you that your reply is strictly confidential and would not be shared with a third party

Your contribution is greatly valued.  
With best wishes

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## Appendix 9: Continuum of Advanced Pharmacy Practice

### Assumptions:

- A) Transition level in the APPF is equivalent to Advanced stage I in the RPS-APF.
- B) Consolidation level in the APPF is equivalent to Advanced stage II in the RPS-APF.
- C) Advanced level in the APPF is equivalent to Mastery stage in the RPS-APF.

### *Continuum of advanced pharmacy practice*



Framework	Advanced Practice Level/Stage		
	Advanced Pharmacy Practice Framework for Australia (APPF)	Transition level	Consolidation level
RPS-Advanced Pharmacy Framework (RPS-APF)	Advanced Stage I	Advanced Stage II	Mastery

### *Description of advanced practice:*

Transition Level (Advanced Stage I)	Consolidation Level (Advanced Stage II)	Advanced Level (Mastery)
<b>Years and area of experience</b>		
Registered pharmacist with 2-3 years general pharmacy practice experience.	Registered pharmacist with 2-5 years experience in the defined area of practice.	Registered pharmacist with more than 5 years experience in the defined area of practice.
<b>Post-registration qualification</b>		
May be undertaking relevant advanced training/postgraduate study.	Holds relevant postgraduate qualification of at least Graduate Diploma level.	Holds relevant postgraduate qualification of at least Graduate Diploma level.
<b>Scope of practice experience</b>		
Working under the guidance (direct supervision or mentoring) of more experienced pharmacist.  A proactive member of the health care team in defined area of practice.	Previous experience working under supervision but working independently in the defined area of practice and starting to influence practice locally.  Responsible for supervising students and less experienced pharmacists.  A team member with acknowledged expertise in the defined area of practice.	Working independently and influencing practice at state or national level.  Guides (directly supervises or mentors) other advanced level pharmacists.  Acknowledged within a multidisciplinary team as a leader in the defined area of practice.



**Other definitions:**

1. **Specialist in Training:** Pharmacist with 1-2 years experience in a specific area of practice
2. **Experienced Practitioner:** Pharmacists with at least three years experience in a specific area of practice
3. **Leading-edge Practitioner:** Pharmacist with at least five years experience in a specific area of practice.

## **Appendix 10: FIP Advanced Pharmacy Framework Study: Interview invite**

Dear Colleague ...

Thank you once again for being a part of the ongoing global advance pharmacy framework study.

The research team would be grateful for your feedback and invite you to participate in a short interview.

The interview would involve obtaining your opinion about the two self-assessments and your general thoughts on the frameworks you used.

I can initiate a 15-20 minutes telephone conversation to obtain the feedback. The call would be your own convenience and confidential.

I look forward to your kind response.

With best wishes,

# Appendix 11: FIP Advanced Pharmacy Framework Study: Interview Schedule

## Interview Schedule

### Part 1 – The Self-assessment Process

Please think about the two self-assessments you undertook for this study:

- A. Have you undertaken any self-assessment activity in the course of your practice prior to this study?

Yes

No

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- B. In general, what are your thoughts (or what do you think) of the two self-assessments you undertook for this study? For example, please provide any thoughts you may have in relation to your practice

### Part 2 – The frameworks

- C. The following questions are aimed directly at obtaining your perspectives about the two frameworks used in this study.
- What are your thoughts about the wordings and descriptions of the competencies in both frameworks (in terms of clarity or ambiguity)? Please give specific details where possible
  - What do you think of the design and layout of the two frameworks you used? Please give specific details where possible and provide any suggestions for improvement if applicable

# Appendix 12: RPS Advanced Pharmacy Framework Questionnaire

## HOW TO COMPLETE THE FRAMEWORK:

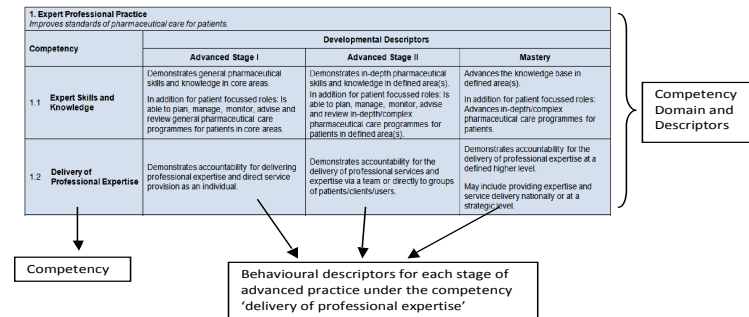
The document is divided into two sections.

**Section 1** requires that you provide information relating to your current post, place of work and career progression.

**Section 2** requires that you rate your current level of practice using the competencies in the Royal Pharmaceutical Society Advanced Pharmacy Framework.

This framework comprises six domains, each one divided into individual competencies and printed on shaded tables. You should first read through each competency domain (*shaded tables*) before commencing your self-assessment.

A schematic description of the layout of each domain is given below using the 'Expert Professional Practice' domain as an example.



Using the un-shaded tables, please assess your current level of practice for each competency (check ONE box only) and indicate the category of evidence you have available to support your assessment. Please check AS MANY evidence boxes that you think supports your assessment. Each evidence category provided represents a group of situations. Please refer to appendix 2 for a description of the evidence categories.

An example of how to carry-out this self-assessment is given on the next page.

Please rate your level of competence under the competencies in this domain		EVIDENCE									
1. Expert Professional Practice Domain <i>(Please see previous page)</i>		Member of a group/service in a broad group of competencies	Member of a group/service in a broad group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies	Member of a group of competencies
1.1. Expert Skills and Knowledge	Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2. Delivery of Professional expertise	Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicate your self-assessed level of practice (see each "competency domain" for description)

Indicate the specific evidence you have available to support your assessment (see appendix 2 for help). You can check as many evidence boxes as necessary

A glossary to help interpret the terminology used in this framework is given in appendix 1. You will also find a description of the several examples that describe the evidence categories in appendix 2. Please read these before starting to complete the documentation.

We recommend that this assessment exercise be undertaken in 3 sessions of 20 minutes. In making your judgements, we ask that you consider your previous experience, as well as the demands of your current position.

Thank you for your participation.

## Section 1: Demographic Details

This section aims to obtain details on your current role and scope of practice. Your personal information is not going to be reported anywhere. It is only used to link your details with subsequent self-assessment in this project.

Name:

I **currently** work in (area of practice: i.e. paediatrics):

***The best description of my current level of practice in this area is (please select one description):***

"Specialist in Training" (i.e. I have been working in this area for between 1 and 2 years)

"Experienced Practitioner" (i.e. I have been working in this area for more than 3 years)

"Leading-Edge Practitioner" (i.e. I have been working in this area for more than 5 years and am recognised outside my organisation for the contribution I make)

***My career progression (please complete the following details):***

Job Title:

Length of time employed in current post:

Type of Employing Organisation:

Length of time employed by this organisation:

Number of years since qualifying as a pharmacist (after pre-registration/ pre-license training):

Professional Qualifications (include all):

To which Professional Organisations are you a member/fellow/affiliated?

## Section 2

Please read through each competency domain (shown on shaded tables) before completing your self-assessment (using the un-shaded tables).

1. Expert Professional Practice <i>Improves standards of pharmaceutical care for patients.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
1.1 <b>Expert Skills and Knowledge</b>	Demonstrates general pharmaceutical skills and knowledge in core areas.  In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.	Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s).  In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s).	Advances the knowledge base in defined area(s).  In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.
1.2 <b>Delivery of Professional Expertise</b>	Demonstrates accountability for delivering professional expertise and direct service provision as an individual.	Demonstrates accountability for the delivery of professional services and expertise via a team or directly to groups of patients/clients/users.	Demonstrates accountability for the delivery of professional expertise at a defined higher level.  May include providing expertise and service delivery nationally or at a strategic level.
<b>Reasoning and Judgement</b>  Including: 1.3 <ul style="list-style-type: none"> <li>• Analytical skills</li> <li>• Judgemental skills</li> <li>• Interpretational skills</li> <li>• Option appraisal</li> </ul>	Demonstrates ability to use skills in a range of routine situations requiring analysis or comparison of a range of options.  Recognises priorities when problem-solving and identifies deviations from the normal pattern.	Demonstrates ability to use skills to make decisions in complex situations where there are several factors that require analysis, interpretation and comparison.  Demonstrates an ability to see situations holistically.	Demonstrates ability to use skills to manage difficult and dynamic situations.  Demonstrates ability to make decisions in the absence of evidence or data or when there is conflicting evidence or data.
1.4 <b>Professional Autonomy</b>	Is able to follow legal, ethical, professional and organisational policies/procedures and codes of conduct.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary.	Is able to interpret relevant policy and strategy, in order to establish goals and standards for others within the defined area(s).

1. Expert Professional Practice Domain <i>(Please see previous page)</i>	EVIDENCE											
	Member of, or provide advice to a local group or committee	Member of, or provide advice to a national or international committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>1.1. Expert Skills and Knowledge</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.2. Delivery of Professional expertise</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.3. Reasoning and Judgment</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.4. Professional Autonomy</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>2. Collaborative Working Relationships</b> <i>Is able to communicate, establish and maintain working relationships and gain the co-operation of others.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
<b>Communication</b>  Including ability to: <ul style="list-style-type: none"> <li>• Persuade</li> <li>• Motivate</li> <li>• Negotiate</li> <li>• Empathise</li> <li>• Provide</li> <li>• Reassurance</li> <li>• Listen</li> <li>• Influence</li> </ul> And <ul style="list-style-type: none"> <li>• Networking Skills</li> <li>• Presentation Skills</li> </ul>	Demonstrates use of appropriate communication to gain the co-operation of relevant stakeholders (including patients, senior and peer colleagues, and other professionals where possible).  Demonstrates ability to communicate where the content of the discussion is explicitly defined.	Demonstrates use of appropriately selected communication skills to gain co-operation of small groups of relevant stakeholders within the organisation.  Demonstrates ability to communicate where the content of the discussion is based on professional opinion.	Demonstrates ability to present complex, sensitive or contentious information to large groups relevant stakeholders.  Demonstrates ability to communicate in a hostile, antagonistic or highly emotive atmosphere.
<b>2.1</b>			
<b>2.2 Teamwork and Consultation</b>	Demonstrates ability to work as a member of a team.  Recognises personal limitations and refers to more appropriate colleague(s) when necessary.	Demonstrates ability to work as an acknowledged member of a multidisciplinary team.  Consulted with the organisation for advice which requires in-depth professional expertise.	Works across boundaries to build relationships and share information, plans and resources.  Sought as an opinion leader both within the organisation and in the external environment.

2. Collaborative Working Relationships <i>(Please see previous page)</i>	EVIDENCE											
	Member of or provide advice to a local group or committee	Member of, or provide advice in a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>2.1. Communication</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.2. Teamwork and consultation</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Leadership <i>Inspires individuals and teams to achieve high standards of performance and personal development.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
<b>3.1 Strategic Context</b>	Demonstrates understanding of the needs of stakeholders. Practice reflects relevant local and national policy.	Demonstrates ability to incorporate relevant national policy to influence local strategy.	Demonstrates active participation in creating relevant national policies.
<b>3.2 Governance</b>	Demonstrates understanding of the pharmacy role in governance. Implements this appropriately within the workplace.	Influences the governance agenda for the team and/or service.	Shapes and contributes to the governance agenda at a higher level.
<b>3.3 Vision</b>	Demonstrates understanding of, and contributes to, the workplace vision.	Creates vision of future and translates this into clear directions for others.	Convinces others to share the vision at a higher level.
<b>3.4 Innovation</b>	Demonstrates ability to improve quality within limitations of service.	Recognises and implements innovation from the external environment.	Takes the lead to ensure innovation produces demonstrable improvement.
<b>3.5 Service Development</b>	Reviews last year's progress and develops clear plans to achieve results within priorities set by others.	Develops clear understanding of priorities and formulates practical short-term plans in line with workplace strategy.	Relates goals and actions to strategic aims of organisation and profession.
<b>3.6 Motivational</b>	Demonstrates ability to motivate self to achieve goals.	Demonstrates ability to motivate individuals and/or the team.	Demonstrates ability to motivate individuals and/or teams at a higher level. May include more strategic motivational activities at local, institutional and national levels.

3. Leadership <i>(Please see previous page)</i>	EVIDENCE											
	Member of, or provide advice to a local group or committee	Member of, or provide advice to a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>3.1 Strategic Context</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.2 Governance</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.3 Vision</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.4 Innovation</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.5 Service Development</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.6 Motivational</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



4. Management <i>Organises and delivers service objectives in a timely fashion.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
4.1 <b>Implementing National Priorities</b>	Demonstrates understanding of the implications of national priorities for the team and/or service.	Shapes the response of the team and/or service to national priorities.	Accountable for the direct delivery of national priorities at a higher level.
4.2 <b>Resource Utilisation</b>	Demonstrates understanding of the process for effective resource utilisation.	Demonstrates ability to effectively manage resources.	Demonstrates ability to reconfigure the use of available resources.
4.3 <b>Standards of Practice</b>	Demonstrates understanding of, and conforms to, relevant standards of practice.	Demonstrates ability to set and monitor standards of practice at team and/or service level.	Accountable for the setting and monitoring of standards at a higher level.
4.4 <b>Managing Risk</b>	Demonstrates ability to identify and resolve risk management issues according to policy/protocol.	Develops risk management policies/protocols for the team and/or service, including identifying and resolving new risk management issues.	Is accountable for developing risk management policies/procedures at a higher level, including identifying and resolving new risk management issues.
4.5 <b>Managing Performance</b>	Follows professional and organisational policies/procedures relating to performance management. Refers appropriately to colleagues for guidance.	Is accountable for performance management for a team or group of personnel.	Is accountable for performance management at a higher and/or institutional level.
4.6 <b>Project Management</b>	Demonstrates understanding of the principles of project management.	Demonstrates ability to successfully manage a project at team and/or service level.	Demonstrates ability to successfully manage a project at a higher level.
4.7 <b>Managing Change</b>	Demonstrates understanding of the principles of change management.	Demonstrates ability to manage a process of change for the team and/or service.	Demonstrates ability to manage a process of change at a higher level.
4.8 <b>Strategic Planning</b>	Demonstrates ability to think 4-12 months ahead within a defined area. Plans the work programme to align with strategy.	Demonstrates ability to think over a year ahead within a defined area.	Thinks long term and sector wide. Takes the long-term perspective.
	Demonstrates understanding of formal structures.	Demonstrates understanding of culture and climate and ability to plan with the whole of the organisation in mind.	Demonstrates understanding of organisational politics and changes in the external environment.
4.9 <b>Working Across Boundaries</b>	Demonstrates ability to extend boundaries of service delivery within the team.	Demonstrates ability to extend the boundaries of the service across more than one team.	Demonstrates the value of extending service delivery across boundaries in the external environment.

4. Management <i>(Please see previous page)</i>	EVIDENCE													
	Member of or provide advice to a regional, national or international group or committee	Member of, or provide advice to a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & research (includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation		
<b>4.1. Implementing National Priorities</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.2. Resource Utilisation</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.3. Standards of Practice</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.4. Managing Risk</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.5. Managing Performance</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.6. Project Management</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.7. Managing Change</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.8. Strategic Planning</b>														
Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Education, Training & Development <i>Supports the education, training &amp; development of others. Promotes a learning culture within the organisation.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
5.1 Role Model	Understands and demonstrates the characteristics of a role model to members in the team and/or service.	Demonstrates the characteristics of an effective role model at a higher level.	Is able to develop effective role model behaviour in others.
5.2 Mentorship	Demonstrates understanding of the mentorship process.	Demonstrates ability to effectively mentor others within the team and/or service.	Demonstrates ability to effectively mentor outside the team and/or service.
5.3 Conducting Education & Training	Demonstrates ability to conduct teaching and assessment effectively according to a learning plan with supervision from a more experienced colleague.	Demonstrate ability to assess the performance and learning needs of others. Demonstrates ability to plan a series of effective learning experiences for others.	Demonstrates ability to design and manage a course of study, with appropriate use of teaching, assessment and study methods.
5.4 Professional Development	Demonstrates self-development through continuous professional development activity.	Facilitates the professional development of others.	Shapes and contributes to the professional development strategy.
5.5 Links Practice and Education	Participates in the delivery of formal education programmes.	Participates in the education and training in an external environment.	Shapes, contributes to or is accountable for the creation or development of higher education qualification(s).
5.6 Educational Policy	Demonstrates an understanding of current educational policies relevant to working areas of practice.	Demonstrates ability to interpret national policy in order to design strategic approaches for local workforce education planning and development.	Shapes and contributes to national education and workforce planning and development policy.

5. Education, Training & Development <i>(Please see previous page)</i>	EVIDENCE											
	Member of, or provide advice to a local group or committee	Member of, or provide advice to a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
5.1 Role Model Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Mentorship Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 Conduct Education & Training Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4 Professional Development Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5 Links Practice and Education Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Research & Evaluation <i>Uses research to deliver effective practice. Identifies and undertakes research to inform practice.</i>			
Competency	Developmental Descriptors		
	Advanced Stage I	Advanced Stage II	Mastery
6.1 Critical Evaluation	Demonstrates ability to critically evaluate and review literature.	Demonstrates application of critical evaluation skills in the context of working practice.	Is recognised as undertaking peer review activities within working practice.
6.2 Identifies Gaps in The Evidence Base	Demonstrates ability to identify where there is a gap in the evidence base to support practice.	Demonstrates ability to formulate appropriate and rigorous research questions.	Demonstrates ability to design a successful strategy to address research questions.
6.3 Develops and Evaluates Research Protocols	Demonstrates ability to describe the core features of research protocols.	Demonstrates ability to design a rigorous protocol to address previously formulated research questions.	Demonstrates active involvement in the critical review of research protocols.
6.4 Creates Evidence	Demonstrates ability to generate evidence suitable for presentation at local level.	Demonstrates ability to generate new evidence suitable for presentation at research symposia.	Demonstrates authorship of primary evidence and outcomes in peer reviewed media.
6.5 Research Evidence Into Working Practice	Demonstrates ability to apply the research evidence base into working practice.	Demonstrates ability to apply research and evidence-based practice within the team and/or service.	Is able to use research evidence to shape policy/procedure at an organisational and/or national level.
6.6 Supervises Others Undertaking Research	Demonstrates understanding of the principles of research governance.	Is able to contribute to research supervision in collaboration with research experts.	Is a research project supervisor for postgraduate students.
6.7 Establishes Research Partnerships	Demonstrates ability to work as a member of the research team.	Demonstrates ability to establish new multidisciplinary links to conduct research projects.	Demonstrates ability to show leadership within research teams concerning the conduct of specialist research.

6. Research & Evaluation <i>(Please see previous page)</i>	EVIDENCE												
	Member of, or provide advice to a local group or committee	Member of, or provide evidence to a national or international group or committee	Active teaching role	Involvement in educational research, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation	
<b>6.1 Critical Evaluation</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.2 Identifies gaps in the evidence base</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.3 Develops and Evaluates Research Protocols</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.4 Creates Evidence</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.4 Research Evidence into Working Practice</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.5 Supervises Others Undertaking Research</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6.6 Establishes Research Partnerships</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

# Appendix 13: Advanced Pharmacy Practice Framework Questionnaire

## HOW TO COMPLETE THE FRAMEWORK:

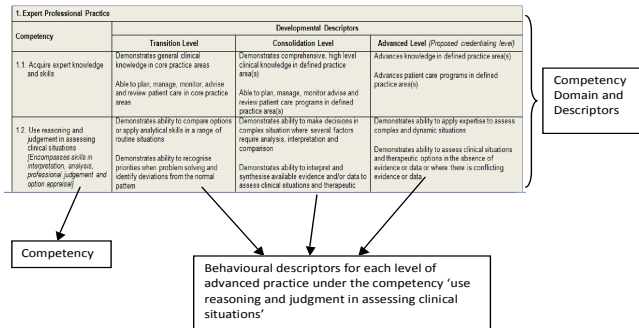
The document is divided into two sections.

**Section 1** requires that you to provide information relating to your current post, place of work and career progression.

The **Section 2** requires that you to rate your current level of practice using the competencies in the Advanced Pharmacy Practice Framework for Australia.

This framework comprises five domains, each one divided into individual competencies and printed on shaded tables. You should first read through each competency domain (*shaded tables*) before commencing your self-assessment.

A schematic description of the layout of each domain is given below using the 'Expert Professional Practice' domain as an example.



Using the un-shaded tables, please assess your current level of practice for each competency (check ONE box only) and indicate the category of evidence you have available to support your assessment. Please check AS MANY evidence boxes that you think supports your assessment. Each evidence category provided represents a group of situations. Please refer to appendix 2 for a description of the evidence categories.

An example of how to carry-out this self-assessment is given on the next page.

Please rate your level of competence under the competencies in this domain

1. Expert Professional Practice Domain (Please see previous page)	Number of responses/ advice to a local group or committee	Number of responses/ advice to regional, national or international group or committee	Advocating one	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & research (services/ patient)	Professional standing & peer status	Documented expert practice	EVIDENCE				
									Membership process & leadership (local level)	Leadership process and leadership (national level)	Staff management	Any OTHER appropriate documentation	
<b>1.1. Expert Skills and Knowledge</b> Advanced stage 1 <input type="checkbox"/> Advanced Stage 2 <input checked="" type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.2. Delivery of Professional expertise</b> Advanced stage 1 <input checked="" type="checkbox"/> Advanced Stage 2 <input type="checkbox"/> Mastery <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicate your self-assessed level of practice (see each "competency domain" for description)

Indicate the specific evidence you have available to support your assessment (see appendix 2 for help). You can check as many evidence boxes as necessary

A glossary to help interpret the terminology used in this framework is given in appendix 1. You will also find a description of the several examples that describe the evidence categories in appendix 2. Please read these before starting to complete the documentation.

We recommend that this assessment exercise be undertaken in 3 sessions of 20 minutes. In making your judgements, we ask that you consider your previous experience, as well as the demands of your current position.

Thank you for your participation.

### Section 1: Demographic Details

This section aims to obtain details on your current role and scope of practice. Your personal information is not going to be reported anywhere. It is only used to link your details with subsequent self-assessment in this project.

Name:

I **currently** work in (area of practice: i.e. paediatrics):

**The best description of my current level of practice in this area is (please select one description):**

"Specialist in Training" (i.e. I have been working in this area for between 1 and 2 years)

"Experienced Practitioner" (i.e. I have been working in this area for more than 3 years)

"Leading-Edge Practitioner" (i.e. I have been working in this area for more than 5 years and am recognised outside my organisation for the contribution I make)

**My career progression (please complete the following details):**

Job Title:

Length of time employed in current post:

Type of Employing Organisation:

Length of time employed by this organisation:

Number of years since qualifying as a pharmacist (after pre-registration/ pre-license training):

Professional Qualifications (include all):

To which Professional Organisations are you a member/fellow/affiliated?

### Section 2

Please read through each competency domain (shown on shaded tables) before completing your self-assessment (using the un-shaded tables).

1. Expert Professional Practice			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level <i>(Proposed credentialing level)</i>
1.1. Acquire expert knowledge and skills	Demonstrates general clinical knowledge in core practice areas  Able to plan, manage, monitor, advise and review patient care in core practice areas	Demonstrates comprehensive, high level clinical knowledge in defined practice area(s)  Able to plan, manage, monitor advise and review patient care programs in defined practice area(s)	Advances knowledge in defined practice area(s)  Advances patient care programs in defined practice area(s)
1.2. Use reasoning and judgement in assessing clinical situations <i>(Encompasses skills in interpretation, analysis, professional judgement and option appraisal)</i>	Demonstrates ability to compare options or apply analytical skills in a range of routine situations  Demonstrates ability to recognise priorities when problem solving and identify deviations from the normal pattern  Applies established practice/therapeutic protocols in responding to clinical situations	Demonstrates ability to make decisions in complex situation where several factors require analysis, interpretation and comparison  Demonstrates ability to interpret and synthesise available evidence and/or data to assess clinical situations and therapeutic options  Seeks guidance where variations to established practice/protocols are indicated	Demonstrates ability to apply expertise to assess complex and dynamic situations  Demonstrates ability to assess clinical situations and therapeutic options in the absence of evidence or data or where there is conflicting evidence or data  Uses judgment to vary practice to respond to contextual requirements
1.3. Deliver accountable and flexible patient care	Accepts accountability for patient care services delivered directly to individual patients  Applies expertise responsibly in delivery of patient care in routine situations  Demonstrates capacity to identify research findings likely to impact on practice	Accepts accountability for patient care services delivered to a defined patient group  Accesses and applies evidence based advice/strategies in complex situations  Demonstrates a responsible approach to integrating evidence into practice	Accepts accountability for patient care services delivered in a defined practice area(s)  Applies expertise confidently to provide services and advice in complex, unpredictable or unfamiliar circumstances  Appraises and integrates new evidence in an innovative and collaborative approach to planning and delivery of patient care
1.4. Use Professional autonomy	Uses expertise to contribute to the care of patients in routine situations  Demonstrates ability to follow legal, ethical, professional and organisational policies/procedures and codes of conduct	Uses available evidence and established practice procedures to provide input to patient care  Demonstrates ability to act according to personal interpretation of broad professional policies/procedures where necessary	Makes autonomous decisions about patient care that are informed by expert knowledge, clinical judgment, available evidence and treatment goals or outcomes  Demonstrates ability to interpret government health care policy and strategy to establish policies/ procedures, codes and/or standards for others within defined practice area(s)

1. Expert Professional Practice Domain <i>(Please see previous page)</i>	EVIDENCE										
	Member of, or provide advice to a local group or committee	Member of, or provide advice to a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Published development related & professional standing & peer status	Documented expert practice	Management access & leadership (local level)	Management access and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>1.1. Acquire Expert Skills and Knowledge</b>  Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.2. Use Reasoning and Judgment</b>  Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.3. Deliver accountable and flexible patient care</b>  Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.4. Use Professional Autonomy</b>  Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2: Communication, collaboration and Team Work			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level <i>(Proposed credentialing level)</i>
<b>2.1. Use appropriate communication skills</b> <i>[Encompasses networking and presentation skills, and interdisciplinary collaboration, as well as ability to persuade, motivate, negotiate, empathise, reassure, listen and influence]</i>	Demonstrates use of appropriate communication to gain the co-operation of individual patients, colleagues and other health professionals  Demonstrates ability to communicate effectively where content of discussion is explicitly defined	Demonstrates use of appropriately selected communication skills to gain co-operation of patients, colleagues, clinicians and/or managers  Demonstrates ability to communicate effectively where the content of the discussion is based on personal opinion	Demonstrates ability to present complex, sensitive or contentious information to large groups of patients, clinicians and/or managers  Demonstrates ability to communicate effectively in a hostile, antagonistic or highly emotive atmosphere
<b>2.2. Engage in teamwork and consultation</b>	Demonstrates ability to work as a member of the pharmacy team  Recognises personal limitations and demonstrates ability to refer to more experienced colleagues	Demonstrates ability to work as a member of a multidisciplinary team  Accepts expert advice through consultation within the workplace/organisation	Works across workplace boundaries to build relationships and share information, plans and resources  Provides expert advice within and beyond the workplace/organisation as a recognised opinion leader
<b>2.3. Work across boundaries</b>	Demonstrates ability to extend boundaries of service delivery within the pharmacy team	Demonstrates ability to extend the boundaries of service delivery across more than one team	Demonstrates the value of extending the boundaries of service delivery across professions and/or the external environment

2. Communication, Collaboration and Team work <i>(Please see previous page)</i>	EVIDENCE											
	Member of committee to provide advice to a local or regional pharmacy association	Member of committee to provide advice to a regional or international group	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local)	Managing process and leadership	Staff management	Any Other Appropriate Documentation
<b>2.1. Use Appropriate Communication Skills</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.2. Engage in Team Work and Consultation</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.3. Work Across Boundaries</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3a: Leadership and Management (a)			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level (Proposed credentialing level)
<b>3.1. Understand strategic context and contribute to strategic planning</b>	Demonstrates understanding of the needs of stakeholders, and practice reflects government health care policy Understands formal structure in which they work Demonstrated ability to plan up to 12 months ahead and in alignment with established strategy	Demonstrates ability to incorporate government health care policy or priorities to influence local strategy Understands culture and climate of the workplace Demonstrated ability to plan more than one year ahead taking account of strategic plan	Participates in development of government health care policy/ strategy or priorities and leads its integration into local strategy Understands the internal and external practice environment Demonstrated ability to develop a long term plan taking a holistic view of the practice environment
<b>3.2. Understand and contribute to clinical governance</b>	Demonstrates understanding of the pharmacist's role in clinical governance and practice reflects the workplace framework	Influences the clinical governance agenda for the team	Shapes and contributes to the clinical governance agenda of the workplace/ organisation
<b>3.3. Understand and contribute to the strategic vision</b>	Demonstrates understanding of, and contributes to, the vision for professional services	Creates the vision for professional services and translates it into clear goals for the pharmacy team	Influences groups of colleagues, clinicians and/or managers to share the vision for professional services
<b>3.4. Contribute to innovation and service development</b>	Demonstrates ability to improve the quality or range of services with limited supervision Applies priorities set by others to develop clear plans for services based on review of recent past performance	Recognises and implements innovation from the external environment without supervision Develops future plans for professional services based on a clear understanding of priorities	Leads efforts to ensure innovation produces demonstrable improvement in service delivery Relates goals and actions to strategic aims of the workplace or profession
<b>3.5. Motivate self and others</b>	Demonstrates ability to self motivate to achieve goals	Demonstrates ability to motivate individuals in the team	Demonstrated ability to motivate individuals beyond the team
<b>3.6. Support and assist implementation of national priorities</b>	Demonstrates understanding of the implications of national health care priorities for the team	Influences the response of the team to national health care priorities	Leads response of the team to national health care priorities

3a. Leadership and Management (Please see previous page)	EVIDENCE											
	Member of, or provide advice to a local group or committee	Member of, or provide advice to a regional, national or international group or committee	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development & leadership (also includes publication)	Professional standing & peer status	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>3.1. Understand strategic context and contribute to strategic planning</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.2. Understand and contribute to clinical governance</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.3. Understand and contribute to the strategic vision</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.4. Contribute to innovation and service development</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.5. Motivate self and others</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.6. Support and assist implementation of national priorities</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



3b: Leadership and Management Contd.			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level <i>(Proposed credentialing level)</i>
<b>3.7. Understand and contribute to the effective use of resources</b>	Demonstrates understanding of the process for effective resource utilisation	Demonstrates effective management of resources	Demonstrates ability to assess and reassign resources to improve effectiveness of use
<b>3.8. Contribute to the identification and effective management of risk</b>	Demonstrates ability to identify and resolve risk management issues using established policy/procedure	Is accountable for developing risk policy/procedure for managing existing and newly identified risks at team level	Is accountable for developing policy/procedure for managing existing and newly identified risks beyond the team
<b>3.9. Promote improved performance</b>	Refers appropriate to colleagues for guidance as required	Is accountable for performance management of team members	Is accountable for performance management of the team as a whole
<b>3.10. Understand and undertake project management</b>	Contributes to performance management processes in accordance with established policy/procedure. Refers appropriately to colleagues for guidance as required	Demonstrates ability to successfully manage a project at team level	Demonstrates ability to plan and supervise the implementation of a project
<b>3.11. Understand change management principles and lead change</b>	Demonstrates understanding of the principles of change management	Demonstrates ability to manage a process of change for the team	Demonstrates ability to lead a change process beyond the team/workplace or across principles
<b>3.12. Serve as a role model and mentor for others</b>	Understands and demonstrates the characteristics of a role model to members of the team  Demonstrates understanding of the mentorship	Demonstrates the characteristics of and effective role model within and beyond the team  Demonstrates characteristics of an effective role model within and beyond the team	Demonstrates ability to engender role model behaviour in others  Demonstrates ability to effectively mentor outside the team

3b. Leadership and Management contd. <i>(Please see previous page)</i>	EVIDENCE										
	Member of group to provide advice to	Member of national/regional/international group or committee	Active teaching role	Involvement in educational vision development, design & provision	Active research participation (includes publication)	Research development & publication (also includes & professional standing & peer status)	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Any OTHER appropriate documentation
<b>3.7. Understand and contribute to the effective use of resources</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.8. Contribute to the identification and effective management of risk</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.9. Promote improved performance</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.10. Understand and undertake project management</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.11. Understand change management principles and lead change</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.12. Serve as a role model and mentor for others</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Professional and ethical practice			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level (Proposed credentialing level)
4.1. Apply and monitor standards of practice	Demonstrates understanding of, and conforms to relevant standards of practice	Accountable for setting and monitoring standards of practice at the team level	Accountable for setting and monitoring standards of practice beyond the team
4.2. Contribute to continuing professional development (CPD) of self and others	Demonstrates self-development through regular CPD and the application of learning to practice	Acts as a CPD facilitator for the profession	Shapes and contributes to the CPD strategy for the profession or other disciplines

4. Professional and ethical practice (Please see previous page)	EVIDENCE											
	Member of, or provide advice to a local group or committee	Member of, or provide advice committee at group or	Active teaching role	Involvement in educational development, design & provision	Active research participation (includes publication)	Research development, projects & publications	Professional standing & peer status	Documented expert practice	Member of professional bodies	Member of professional bodies (national level)	Staff management	ANY OTHER appropriate documentation
4.1. Apply and monitor standards of practice Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2. Contribute to Continuing Professional Development (CPD) of self and others Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5a. Critical Analysis, Research and Education			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level (Proposed credentialing level)
<b>5.1. Conduct of education and training</b>	Demonstrates an understanding of current educational policy  Demonstrates ability to conduct teaching efficiently according to an agreed plan with guidance from a more experienced colleague	Demonstrates ability to interpret national policy in order to design strategic approaches for local workforce education  Able to assess the performance and learning needs of others  Demonstrates ability to plan a series of effective learning experiences for others	Shapes and contributes to national education policy  Demonstrates ability to design and manage a course of study, with appropriate use of teaching assessment and study methods
<b>5.2. Links practice and education</b>	Participates in the formal education of undergraduate and postgraduate students	Participates in the education and training of formal special interest groups in the external environment	Shapes, contributes to, or is accountable for the creation or development of higher education qualification(s)
<b>5.3. Educational policy</b>	Demonstrates an understanding of current educational policies in health services	Demonstrates ability to interpret national policy in order to design strategic approaches to local workforce education	Shapes and contributes to national educational policy
<b>5.4. Undertake critical evaluation activities</b>	Demonstrated ability to critically evaluate literature sources	Demonstrated application of critical evaluation skills in the context of practice	Recognised as undertaking peer review activities in practice
<b>5.5. Identify gaps in evidence base</b>	Demonstrates ability to identify gaps in the evidence base for practice	Demonstrates ability to formulate appropriate and rigorous research questions to address evidence gaps	Demonstrates ability to design an appropriate research strategy to address research questions

5a. Critical Analysis, Research and Education (Please see previous page)	EVIDENCE										
	Meaningful or contributory advice to a group of community health professionals	Active teaching role	Developmental or organisational provision	Active research participation (includes publication)	Published or unpublished research	Professional standing & peer	Documented expert practice	Management process & leadership	Management processes (level)	Staff management	Documentation appropriate
<b>5.1. Conduct of education and training</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5.2. Links practice and education</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5.3. Educational policy</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5.4. Undertake critical evaluation activities</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5.5. Identify gaps in evidence base</b> Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5b. Critical Analysis, Research and Education contd.			
Competency	Developmental Descriptors		
	Transition Level	Consolidation Level	Advanced Level (Proposed credentialing level)
5.6 Design and deliver research projects to address gaps in the evidence base	Demonstrates ability to describe the core features of research protocols  Demonstrates ability to generate evidence suitable for presentation at the local level	Demonstrates ability to design a research protocol to address previously formulated research questions  Demonstrates ability to generate new evidence suitable for presentation at research symposium	Demonstrates active involvement in critical review of research protocols  Demonstrates authorship of primary evidence outcomes in peer reviewed media
5.7 Apply research evidence into practice	Demonstrates ability to apply research into own practice	Demonstrates ability to apply evidence-based practice within the team	Is able to use research evidence to shape workplace/organisational policy/procedure
5.8 Supervise others undertaking research	Demonstrates understanding of research governance	Is able to contribute to research supervision in collaboration with research experts	Is a research project supervisor for postgraduate students
5.9 Establish research partnerships	Demonstrates ability to work as a member of a research team	Demonstrates ability to establish new multidisciplinary links to conduct research projects	Demonstrates ability to show leadership within research teams concerning the conduct of research

5b. Critical Analysis, Research and Education contd. (Please see previous page)	EVIDENCE										
	Member of top up or provide advice to a member of top up or provide advice	Member of top up or provide advice to a member of top up or provide advice	Active teaching role	Involvement in educational development provision	Active research participation	Research development & publication as a member of a professional standing & peer reviewed expert practice	Documented expert practice	Managing process & leadership (local level)	Managing process and leadership (national level)	Staff management	Appropriate
5.6. Design and deliver research projects to address gaps in the evidence base Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7. Apply research evidence into practice Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.8. Supervise others undertaking research Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.9. Establish research partnerships Transition Level <input type="checkbox"/> Consolidation Level <input type="checkbox"/> Advanced Level <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix 14: Expert Panel Invite and Briefing Note



### **Developing a Global Competency Framework for Advanced Pharmacy Practice Invitation to Participate in an Expert Panel**

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Dear Expert Pharmacy Practitioner,

In recognition of your expertise in the field of pharmacy, the Development Team of the FIP Education Initiative (FIP*Ed*) would like to invite you to participate in an expert panel being conducted to assess the feasibility of developing a global competency framework for advanced pharmacy practice. This work is being conducted as part of the Advanced Practice Domain of the Education Development Team of FIP*Ed*.

Previous research carried out in 2004 by the CoDEG research group in the United Kingdom, identified the competencies required for advanced level pharmacy practice<sup>4</sup>. These competencies were validated and subsequently synthesised by the Royal Pharmaceutical Society of Great Britain (via consensus development panels) into a valid practitioner development tool for advanced level pharmacy practice, the 'RPS Advanced Pharmacy Framework' (RPS-APF)<sup>5</sup>.

In 2012, a competency framework for advanced pharmacy practice in Australia was developed from a similar bibliographic source. This framework, called the 'Advanced Pharmacy Practice Framework for Australia' (APPF), contained competencies that had been adapted to the local needs of the pharmacy workforce in Australia<sup>6</sup>. The

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<sup>4</sup> Meadows N., Webb D., McRobbie D., Antoniou S., Bates I., Davies G., 2004. Developing and validating a competency framework for advanced pharmacy practice. *Pharmaceutical Journal*, 273 (7327) 789-792

<sup>5</sup> Royal Pharmaceutical Society, 2013. The RPS Advanced Pharmacy Framework (APF), available at: <https://www.rpharms.com/faculty-documents/rps-advanced-pharmacy-framework-guide.pdf>

<sup>6</sup> The Advanced Pharmacy Framework for Australia, available at <http://www.psa.org.au/download/standards/advanced-pharmacy-practice-framework.pdf>

aim of this expert panel is to test for parity between the RPS-APF and the APPF frameworks. The objectives are to:

- Obtain expert opinion on the results of a mapping exercise carried out between the APPF and the RPS-APF.
- Obtain consensus opinion on the final framework derived from this mapping exercise.

A report containing all the comments and consensus opinions provided by the expert panel will be generated and forwarded to all members for a review and approval.

### **Confidentiality**

All responses and discussions are strictly confidential. No information identifying any member of this panel will be revealed to a third party. All data collected will be kept in locked filing cabinets at the Department of Practice & Policy, UCL School of Pharmacy, United Kingdom.

### **Further Information**

Further information about the scope of discussion as well as the session plan and other documents is attached. These documents contain relevant information that will enable you reach an informed decision about your participation.

If you require more information, please contact any of the following:

- Arit Udoh, [ucnvaud@ucl.ac.uk](mailto:ucnvaud@ucl.ac.uk), Research Associate, FIPeD
- Prof. Ian Bates, Director, FIPeD Development Team
- Dr. Andreia Bruno, [education@fip.org](mailto:education@fip.org), Project Co-ordinator and Researcher, FIPeD
- Ms Kirstie Galbraith, [kirstie.Galbraith@monash.edu](mailto:kirstie.Galbraith@monash.edu), Domain Lead, Advanced Practice Competencies, FIPeD.

## **Developing a Global Competency Framework for Advanced Pharmacy Practice Briefing Notes**

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This expert panel is being conducted as part of a study by the Development Team of the FIP Education Initiative (FIPeD). The study aims to develop and evaluate advanced level pharmacy practice in a global context and is in two stages. The aim of this expert panel is to obtain qualitative information in a systematic manner, from a group of expert practitioners involved in the development and recognition of advanced pharmacy practice around the world.

Experts from countries with a defined advanced pharmacy practice cadre will be invited to participate in an expert panel. Panel members will number between 20-24 members and a member of the panel will be invited to facilitate the group discussion. Members of the panel will be provided with the results of a framework mapping exercise carried out between the RPS Advanced Pharmacy Framework (RPS-APF) and the Advanced Pharmacy Practice Framework for Australia (APPF). Using a modified Delphi method, individual members of the expert panel will be requested to provide their professional opinion and rate their level of agreement with the outcome of the framework mapping. Consensus on a given item will be achieved when unanimous agreement or disagreement is attained on a particular item.

During the meeting, panel participants will also be given an opportunity to discuss their opinions with other experts and this discussion session is expected to provide an avenue for debate, clarification and discussions on items where consensus has not been reached. The overall aim of this meeting is to reach group consensus and agreement on the results of the mapping exercise. A report of the discussions, comments and consensus opinion expressed during this meeting will be collated and fed back to the panel for review and approval.

# Expert Panel Meeting

## FIP Congress, Dublin 2013

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### Session Outline:

1. Introduction
  - a) Introduction of panel members (10mins)
  - b) Presentation of aims and objectives of meeting (5mins)
2. Presentation of opinion on the outcomes of the framework mapping (10mins)
3. Review of each cluster and further discussions (30mins)
4. Clarification on areas of non-consensus (20mins)
5. Final consensus and agreement (10mins)



## Appendix 15: List of Publication and Conferences Attended

- Udoh, Arit., Bruno, A., Bates, I., (2013). Developing Foundation Level Pharmacy Practice in Africa. Abstract and poster submitted for the PhD day presentation, 19<sup>th</sup> April 2013, UCL school of Pharmacy.
- Udoh. A. Better Quality Pharmacy Education Produces Better Pharmacists. *International Pharmacy Journal* 2013; 31: 41-42.
- Udoh, Arit., Bruno, A., Bates, I., (2013). Developing and Evaluating Advanced Level Pharmacy Practice Competencies in a Global Context. Abstract and poster presented at the 73<sup>rd</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences, 31 Aug. to 5<sup>th</sup> Sept. 2013, Dublin, Ireland.
- Udoh, A., Bruno, A., Bates, I., (2014). Developing the Global Pharmacy Workforce: An Opportunity for Stakeholders' Engagement in Africa. *The African Pharmacist* 2: 41-42.
- Udoh, Arit., Bruno, A., Bates, I., (2014). Evaluating Advanced Level Pharmacy Practice Competencies in a Global Context. Abstract and poster presented at the 74<sup>th</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences, 31<sup>st</sup> Aug. to 4<sup>th</sup> Sept. 2014, Bangkok, Thailand.
- Udoh, Arit., Bruno, A., Bates, I., (2015). Evaluating Advanced Pharmacy Practice Competencies in a Global Context. Abstract and PhD day presentation, 24<sup>th</sup> April 2015, UCL school of Pharmacy.

### Other science related publication:

- Two genes linked to up to ten percent of severe violent crime | BioNews 2014 | Arit Udoh | available at [http://www.bionews.org.uk/page\\_466049.asp](http://www.bionews.org.uk/page_466049.asp)
- Study suggests novel genetic mechanism behind HIV immunity | BioNews 2014 | Arit Udoh | available at [http://www.bionews.org.uk/page\\_468307.asp](http://www.bionews.org.uk/page_468307.asp)
- Gene variants protects Latin-American women from Breast Cancer | BioNews 2014 | Arit Udoh | available at [http://www.bionews.org.uk/page\\_466049.asp](http://www.bionews.org.uk/page_466049.asp)
- Smoking can erase the 'Y' chromosome | BioNews 2014 | Arit Udoh | available at [http://www.bionews.org.uk/page\\_478242.asp](http://www.bionews.org.uk/page_478242.asp)

### **Conferences attended:**

- International Conference of Pharmacists and Pharmaceutical Sciences, FIP Centennial conference, Oct. 3<sup>rd</sup> to 8<sup>th</sup> 2012, Amsterdam, Netherlands.
- Conference of Medical Communication, UCL Institute of Education, 10<sup>th</sup> July, 2013
- International Conference of Pharmacists and Pharmaceutical Sciences, 31 Aug. to 5<sup>th</sup> Sept. 2013, Dublin, Ireland.
- International Conference of Pharmacists and Pharmaceutical Sciences, 31 Aug. to 4<sup>th</sup> Sept. 2014, Dublin, Ireland.
- Get Your Career Going. Early career conference, UCL Institute of Epidemiology and Healthcare, 19<sup>th</sup> Feb., 2015.
- Conference of Medical Communication, University of Westminster, 1<sup>st</sup> July, 2015.

### **Training and certifications:**

- Certificate of completion, Good Clinical Practice (GCP), National Institute for Health Research, United Kingdom (September, 2015).
- Certificate of completion, Research Data and Confidentiality, Medical Research Council (MRC), United Kingdom (November, 2015).
- Certificate of completion, Research and Human Tissue Legislation, Medical Research Council (MRC), United Kingdom (December, 2015).
- Design and Interpretation of Clinical Trials. Bloomberg School of Public Health, John Hopkins University. Coursera® Verified Certificate, License AWDT3W2QE2 (April, 2015).
- Health Literacy and Communication for Health Professionals. University of Nebraska Medical Centre. Coursera® Verified Certificate, License T5K699YCPN (December, 2014).
- Associate Fellow, Higher Education Academy of United Kingdom, (December, 2014).
- Associate Fellow, Centre for the Advancement of Learning and Teaching (CALT), University College London (December, 2014).
- Science Reporting and Communication Internship, 17<sup>th</sup> October to 16<sup>th</sup> December 2014, BioNews UK.
- Health in Numbers: Quantitative Methods in Clinical & Public Health Research. Harvard School of Public Health, Edx® courseware platform (January, 2013).