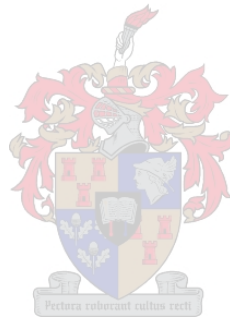


Stepping on the Ladder of Integration: The Perspectives of Foundational Science

Teachers on a Discipline- Based Curriculum

by

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Research Assignment submitted in partial fulfilment of the requirements for the degree of Masters of Philosophy in Health Professions Education at the Faculty of Medicine and Health Sciences, Stellenbosch University

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DECLARATION

I, Ganiat Olutoyin Omoniyi-Esan the undersigned, hereby declare that the entire body of work contained in this research assignment is my own, original work; that I am the sole author, the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously submitted it, in its entirety or in part, at any university for a degree or other qualification.

Signature: **Date: 27 November 2018**

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I say thank you to my co-workers in the Department of Morbid Anatomy and Forensic Medicine, Obafemi Awolowo University, Ile-Ife, Nigeria, for providing me with an enabling environment and encouragement to complete this study.

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ABSTRACT

Integrated curriculum is defined variously by different researchers. Integration involves intentionally bringing together knowledge, skills, values and attitudes within and across courses to develop a more holistic understanding of the subject. The College of Health Sciences, Obafemi Awolowo University (CHS, OAU) Ile-Ife, Nigeria, was established over forty-five years ago and still runs the traditional discipline-based curriculum. There are an overwhelming number of calls by some faculty members at the College to review the medical curriculum and to change it to a more innovative curriculum. Most curricular innovations have integration as part of their components. For integration to be effective, the teachers need to be involved in the curriculum development, design, implementation and the process of evaluation. Full understanding, support and commitment of teachers are necessary for effective integration of the curriculum. The learning needs of the foundational science teachers also need to be addressed and the level of integration desired must be understood. The purpose of this research assignment was to explore the perspectives of foundational science teachers on integration of courses within a discipline-based curriculum. The understanding of foundational science teachers of the term 'Integration within the curriculum' and their perceptions of the need for integration, were explored. When integrating the foundational sciences and possible strategies by which integration could be implemented, barriers and enablers were identified. This was a qualitative enquiry based study within an interpretive paradigm framework. The data was obtained by the researcher through focus group discussions conducted with participants. Using the process of thematic analysis the perspectives of the foundational teachers were grouped into the themes that emerged.

Four prominent themes that emerged were knowledge of integration, perception of the need for and benefits of integration, the enablers and barriers to integration, and suggestions in order to implement curriculum integration.

The participants demonstrated their understanding of what curriculum integration meant and expressed their perspectives of the need for and benefits of integration. Various barriers were identified and suggestions were discussed with some recommendations made.

OPSOMMING

Geïntegreerde kurrikula word deur verskillende navorsers verskillend verstaan. Integrasie behels die geleentheid om kennis, vaardighede, waardes en houdings binne en oor kursusse bymekaar te bring om 'n meer holistiese begrip van die vak te ontwikkel. Die Universiteit van Gesondheidswetenskappe, Obafemi Awolowo Universiteit (CHS, OAE) Ile-Ife, Nigerië, is meer as vyf en veertig jaar gelede gestig en het steeds 'n tradisionele dissiplinêr -gebaseerde kurrikulum. Daar is 'n oorweldigende hoeveelheid versoeke deur fakulteitslede by die Kollege om die mediese kurrikulum te hersien en om dit te verander na 'n meer innoverende kurrikulum. Integrasie vorm deel van die meeste kurrikula innovasies. Vir integrasie om doeltreffend te wees, moet die dosente betrokke wees by die kurrikulumontwikkeling, ontwerp, implementering en evalueringsproses.

Die doel van hierdie navorsingsopdrag was om die perspektiewe van grondslagwetenskapdosente oor die integrasie van kursusse binne 'n dissiplinêr-gebaseerde kurrikulum te verken. Die begrip van grondslagwetenskapdosente wat betref die term 'Integrasie binne die kurrikulum' is ondersoek en ook hul persepsies oor die behoefte aan integrasie. Die hindernisse en instaatstellende faktore van integrasie van die fundamentele wetenskappe en moontlike strategieë waardeur integrasie geïmplementeer kan word, is deur die dosente geïdentifiseer. Die studie volg op 'n kwalitatiewe ondersoek gebaseer op 'n interpretatiewe paradigma raamwerk. Die data is deur die navorser verkry deur middel van fokusgroepbesprekings wat met deelnemers gedoen is. Deur die proses van tematiese analise is die perspektiewe van die grondslagdosente gegroepeer in die temas in temas groepeer.

Vier prominente temas wat na vore gekom het, is kennis van integrasie, persepsie oor die behoefte en voordele van integrasie, die instaatstellende faktore en hindernisse vir integrasie, en voorstelle vir die implementering van kurrikulumintegrasie.

Die deelnemers het hul begrip van wat kurrikulumintegrasie beteken en hul perspektiewe wat betref die behoefte en voordele van integrasie gedeel. Verskeie struikelblokke is geïdentifiseer en voorstelle deur die dosente, sowel as die aanbevelings bespreek.

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Acronyms and Abbreviations

OAU – Obafemi Awolowo University

CHS – College of Health scheme

HOD – Head of Department

SU – Stellenbosch University

CHAPTER ONE: ORIENTATION OF THE STUDY

Chapter one describes the introduction to the research assignment, the background and the context in which the research was carried out. It also describes and explains the concept of integration within the curriculum, the motivation for the study as well as the research question, aim and objectives. Chapter one concludes with the outline of the entire research assignment.

1.1 Introduction

This study is focused on exploring the perspectives of foundational science teachers on integration of courses within a discipline-based curriculum. Integration refers to combining courses that can be taught together and in context. Integrated curriculum is defined in various ways by different researchers. Integration involves intentionally bringing together knowledge, skills, values and attitudes within and across courses to develop a more holistic understanding of the subject (Atwa & Gouda, 2014). Shoemaker (1989) defines the integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study” (Shoemaker, 1989: 2). There have been changes in medical curricula over the years in response to the changing role of health professionals in the society (Jones, Higgs, de Angelis & Prideaux, 2001). Most innovative curricula have integration included in the curricular design (Grant, 2014). Furthermore, there are increasing discussions about integration in curricular design to bridge the gap between the foundational sciences and the clinical sciences (Harden, 2000; Grant, 2014). For integration to be effective, stakeholders need to be involved in the curricular development or renewal process (Hopkins, Pratt, Bowen & Regehr, 2015). The teachers are important stakeholders in the design, implementation and evaluation of the curriculum and need to be actively involved in every stage of the process. Jones *et al.* (2001) also alluded to the fact that teachers’ involvement and ownership are important to sustain curricular change. The perspectives and learning needs of the teachers need to be taken into consideration before commencing an integrated curriculum. The understanding of the teachers on integration within the curriculum, the need for integration and the perceived challenges for an effective integrated curriculum, are explored in this study.

1.2 Background and Context

The MBChB programme at the College of Health Sciences (CHS), Obafemi Awolowo University, (OAU) Ile-ife Nigeria, is a six-year programme with a one year premedical period. Thereafter,

foundational sciences are taught in the second and third-year in the University setting. Pathology and Pharmacology are taught in the fourth-year while the students spend the final two years in the hospital and community settings learning at the bedside of patients. Foundational sciences are presently taught as individual, discreet, discipline-based subjects. Anatomy, Physiology and Biochemistry are taught separately in the preclinical years. Each subject has its own block of time and the contents are scheduled by each department without knowledge of the content being taught by the other departments. For instance, the students may be learning anatomy of the lower limbs in the Anatomy department while in the Physiology department students may be learning the physiology of the cardiovascular system.

New innovations in medical curricula in the past two decades have advocated a paradigm shift from discipline-based, fragmented teaching to an integrated curriculum (Grant, 2014; Jones *et al.*, 2001; Harden, Sowden & Dunn, 1984). However, most medical schools in Nigeria have not adopted integration in teaching the basic and clinical sciences (Gukas, 2007; Olapade-Olaopa, Adaramoye, Raji, Fasola & Olopade, 2016).

The CHS, OAU, Ile-Ife currently operates the traditional-model curriculum which has been in use since inception of the College (CHS, 2012). The College is currently in the process of curriculum review and a new integrated curriculum is being proposed by the College.

1.3 Motivation for the Study

The College of Medicine, University of Ibadan, which was the first medical school in Nigeria, has over the last couple of years changed its curriculum from the traditional model, that had been in use for more than fifty years, to a new curriculum with integration of foundational sciences (Olapade-Olaopa *et al.*, 2016). It is therefore, important that other medical institutions in Nigeria learn from this and also take the necessary steps towards integration of foundational sciences in their medical schools.

The foundational sciences are presently taught as distinct subjects at the CHS, OAU Ile-Ife. The foundational science teachers are a mix of teachers with medical training background and those without medical training, but with appropriate qualifications in their field of expertise. For curricular integration to be successful, the perspectives of the teachers are very important. Hopkins *et al.*, (2015) argued that integrating the curriculum without integrating the teachers, is one of the major reasons why integration has not worked in some settings in the past. Hopkins *et al.*, (2015) further recommended that the perspectives and learning needs of teachers should be taken into consideration when planning structural changes within the curriculum. This study, therefore, seeks to explore the perspectives of foundational science teachers on integration of courses within a discipline-based curriculum that presently exists in

the institution.

The perspectives of foundational teachers on integration within the curriculum, in this context, are not clearly understood. This led to questions around the understanding of the term integration and also the need for it. The findings from the research could be useful to the institution and the curricular committee during the intended curricular review process.

1.4 Problem Statement

The College of Health Sciences, Obafemi Awolowo University (CHS, OAU) Ile-Ife, Nigeria was established over forty-five years ago. The present six-year MBChB curriculum was introduced by the College thirty years ago. The curriculum is a traditional discipline- based model with various innovations in teaching and learning methodologies. There are an overwhelming number of calls by some faculty members for the College to review the medical curriculum and to change to an integrated competency-based curriculum as this seems to be a trend worldwide (Harden, 2015).

Adopting a competency-based curriculum means that some courses will have to be integrated either vertically or horizontally to achieve the expected learning outcomes. As Grant described, ‘it seems almost universally acceptable that the practice of medicine requires the integration of all the component parts (Grant, 2014 :37). The following research question, aim and objectives were formulated with the above-mentioned situation in mind.

1.5 The Research Question

The research question for this study was: What are the perspectives of foundational science teachers at the CHS.OAU, Ile-Ife, Nigeria medical school with regards to integration of courses within their discipline-based curriculum?

1.6 Aims and objectives of the Study

The aim of the research was:

- to explore the perspectives of foundational science teachers on integration of courses within the undergraduate medical curriculum.

The specific objectives were:

- to explore the understanding of foundational science teachers on the term ‘Integration within the curriculum’
- to explore the perspectives of foundational science teachers on the need for integration,
- to identify the perceived barriers and enablers when integrating the foundational sciences, and
- to identify possible strategies by which integration can be implemented.

1.7 Research design and methodology

The study followed a qualitative enquiry based on an interpretive paradigm framework (Merriam, 2009; Denscombe, 2007). Three focus group discussions were conducted with the foundational science teachers. Focus group discussion is a well-suited methodology to explore attitude, behaviour and beliefs, and is particularly useful in exploring new and emerging social phenomenon where boundaries have been less well defined (Barbour, 2005). An inductive approach was followed in analysing the transcribed data.

1.8 Ethical Considerations

Ethical approval was obtained from the Stellenbosch University Health Research and Ethics Committee (HREC Reference #: S18/03/066) and Institute of Public Health, CHS, OAU, Ile-Ife, Nigeria (Ref IPH/OAU/12/1036) before the commencement of the study at the CHS. Written informed consent was obtained from each participant. Participation was entirely voluntary and participants were free to decline to participate and also free to withdraw from the study at any point during the study. Confidentiality was maintained throughout the study and no personal identifier was used to identify any participant.

1.9 Assignment Outline

The research assignment consists of five chapters. Chapter two focuses on literature review in which various concepts about the curriculum, curriculum design and curriculum models are discussed. The chapter also focuses on integration within the curriculum, exploring the benefits and challenges thereof and the roles of teachers as stakeholders. Chapter three describes the research design and the methodology while the findings are presented in chapter four. The discussion, recommendations, limitations and conclusion are presented in the final chapter.

CHAPTER TWO: OVERVIEW OF THE LITERATURE

Chapter two provides an overview of the literature that is pertinent to curricular development and the implementation thereof. Special attention is given to integrated curriculum, the methods, benefits and barriers of integration and the role of stakeholders in effective implementation of the curriculum. The chapter concludes with curricular models in medical education.

2.1 The curriculum

The curriculum is the core of an educational institution and is defined as ‘all the planned educational experiences of a school or educational institution’ (Prideaux, 2003 p.286). The curriculum should respond to the sociocultural values and the professional context where it will be implemented (Grant, 2014). Medical education curricula have gone through significant changes over the last few years. There have been changes from a traditional model to a multidisciplinary approach, outcome-based and competency-based curricula (Grant, 2014). The Lancet article by Frenk, Chen, Bhutta and colleagues (2010), enumerated the disparities between the health and healthcare needs of the society. The authors emphasized the importance of aligning health profession education to societal needs. They further elaborated on the need to bridge the gap between the population health needs and the required training of health professionals (Frenk, Chen, Bhutta *et al.*, 2010). Most curricular innovations are improvements on previous approaches and curricular models (Grant, 2014) and are aimed at addressing the medical educational needs of practitioners and the health needs of the society. The changing societal and practitioners’ needs also require changes in medical curricular design to meet up with these requirements (Jones *et al.* 2001). There are increasing discussions about integration in curricular design in order to bridge the gap between the foundational sciences and the clinical sciences (Harden, 2000; Grant, 2014). Integration is bringing together courses that can be taught together and in context.

Many medical faculties and institutions in the developed countries now have integration as part of the curriculum (Gruppen, Burkhardt, Fitzgerald, Funnell, Haftel, Lypson, Mullan, Santen, Sheets & Kent, 2016). However, the situation is currently not the same in low- and medium-income countries where only a few institutions have incorporated integration within the curriculum (Kiguli-Malwadde, Talib,

Wohltjen, Connors, Gandari, Bana, Maggio, & van Schalkwyk, 2015). The concept of integration within the curriculum will be discussed further in section 2.3.

2.2 Curriculum Development, Design and Implementation

The basic elements in the curriculum are: the educational strategies, the content, the assessment methods, the implementation and evaluation methods. Different approaches to curricular design are recognized. For instance, Kern, Thomas, Howard & Bass (1998) developed the “six-step approach” to curricular development and Harden’s “Ten questions” to consider in curricular development (Harden, 1986) that was published about thirty years ago has been used by many educators in the process of curricular review. Harden (1986) expatiated further on the “Ten questions” to consider in developing a curriculum. The ten questions of Harden include the Kern’s six-steps, such as, the educational environment that stimulates learning, the implementation and organization of the course and how the programme will be managed in order to foster improved learning experiences (Harden, 1986; Kern *et al.*, 1998). These are all crucial elements of the curriculum.

The “six-step approach” to curricular development includes: problem identification and general needs assessment, needs assessment of targeted learners, (these include situational and stakeholders’ analyses), goals and objectives of the curriculum, educational strategies, implementation including plan for faculty development and evaluation (assessment) as well as feedback and evaluation of the curriculum (Kern , Thomas , Howard & Bass ,1998) (see Fig 1). Problem identification and general needs assessment is the first step in curricular development as described by Kern *et al.*, (1998). Burdick (2007) posited that ‘higher education in the health professions must be closely aligned with community health needs, requiring the training and support of community health professionals’ (Burdick, 2007 p.883). Therefore, a medical curriculum should be tailored to address the general need of the community (Kern *et al.*, 1998). The second step in the curriculum development in the six-step approach, is the targeted needs assessment of learners and stakeholders within the context of a medical institution. Targeted needs assessment of stakeholders allows incorporation of a specific curriculum to the overall curriculum and fosters opportunities for communication among stakeholders (Kern *et al.*, 1998). The teachers and learners are important stakeholders in curricular development and review process. The goals and objectives of the curriculum are based on the knowledge, skills, and attitudes required and the general intended values and characteristics of the curriculum, the quality of graduates and curricular structure (Grant, 2014). Specific objectives may be described as objectives which the students are able to display; the outcome or competencies which are a clear guidance of what the students have to learn, be able to do and should be measurable (Grant, 2014). Being specific about the curricular objectives will assist in the choice of curricular content, appropriate learning and evaluation methods (Kern *et al.*, 1998). The goals and objectives also provide a framework for assessing the effectiveness of a curriculum. The educational

strategies of the curriculum include the content, instructional methodology assessment methods and how the curriculum should be organized. Various curricular models exist on how a curriculum could be organized. Some of these models are the traditional model, innovative model (SPICES) (Harden *et al.*, 1984), PRISM model (Bligh, Prideaux & Parsell, 2001), outcome-based model (Harden, 2015), competency-based model (Harris, Snell, Talbot & Harden, 2010) and integrated models (Harden, 2000). These curricular models will be discussed further in subsequent sections.

Curricular implementation involves the process of carrying out what is planned in the curriculum. The curriculum exists at three levels: what is planned, what is delivered and what the students' actually experienced (Prideaux, 2003). The intended curriculum is the documented, official plan or what the faculty hopes students will learn, while the achieved curriculum includes knowledge, skills and attitudes that are truly learned and remembered by the students (Prideaux, 2003). The available resources: physical, financial and human resources influence the implementation of the curriculum (Kern *et al.*, 1998). Evaluation of the programme and feedback from stakeholders are, therefore, crucial aspects of the curricular development process.

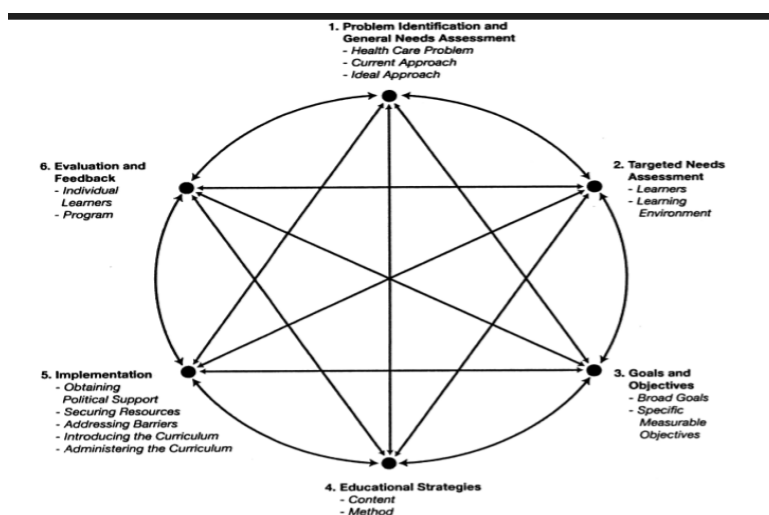


Figure 1. Six-step approach to curricular development (Kern, Thomas, Howard & Bass, 1998).

The six-step approach is an interactive and iterative process that can commence at any step, especially in situations where there are pre-existing curricula. For instance, goals and objectives and educational strategies may precede problem identification. Evaluation of the programme may also be useful for targeting the needs of the learner and educational strategies may be used in future to review the curriculum.

2.3 The Integrated Curriculum

Integrated curricula are defined in various ways by different researchers. Shoemaker (1989) defines the integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study” (Shoemaker, 1989: 2). Harden also defined integration as ‘the organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments (Harden *et al*, 1984 : 288). Integration involves intentionally bringing together knowledge, skills, values and attitudes within and across courses to develop a more holistic understanding of the subject (Atwa & Gouda, 2014). Integration refers to combining courses that can be taught together and in context.

Most innovative curricular structures have integration within the curriculum (Harden *et al*, 1984; Harden, 2000; Harris *et al.*, 2010; Olapade-Olaopa *et al.*, 2016). The SPICES model, PRISMS model, OBE and CBME have integration as a crucial component of the curriculum. Furthermore, there are increasing discussions about integration in curricular design and the need to bridge the gap between the foundational sciences and the clinical sciences (Harden, 2000; Grant, 2014).

2.3.1 Methods and Importance of Integration within the Curriculum.

Three different methods of integration are recognized, namely, horizontal, vertical and spiral integration (Hays, 2013; Brauer and Ferguson, 2015). Horizontal integration involves the amalgamation of courses within disciplines in the pre-clinical phase, for example, foundational sciences such as Anatomy, Physiology and Medical biochemistry; while vertical integration occurs across disciplines in both the preclinical and clinical sciences (Dahle, Brynhildsen, Behrbohm, Rundquist & Hammar, 2002). Anatomy and Anatomic pathology can, for example, be integrated in a vertical approach. Spiral integration is a combination of both horizontal and vertical integration in which foundational and clinical sciences are taught in an interactive manner throughout the curriculum (Brauer & Ferguson, 2015). As part of spiral integration, topics are revisited throughout the programme in successive levels and with increasing difficulty until the learning outcome is achieved (Harden & Stamper, 1999). Even though different conceptual frameworks on integration exist, each institution needs to decide what will work in their context and within the curricular framework. Integration can be advanced by encouraging teaching and learning around common themes or topics. For example, tuberculosis can be taught in an integrated format by the anatomist, radiologist, pathologist, pharmacologist, internal and community medicine physicians (Worley, Esterman and Prideaux, 2004; Basu, Das and Chowdhury, 2015).

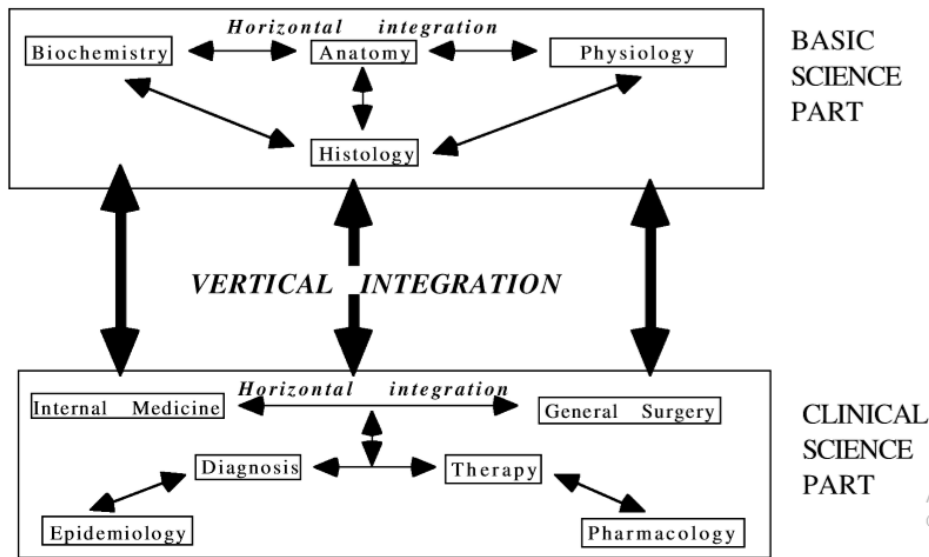


Figure 2. Horizontal and vertical integration (Dahle *et al.*, 2002).

The integration of Anatomy, Physiology and Medical biochemistry is necessary as these are the foundational subjects that introduce learners to other aspects of clinical practice. It is also desirable to align the content of instructions to the clinical needs of the learners and the learning outcomes. The General Medical Council (GMC) in the United Kingdom strongly recommends the integration of the basic sciences and clinical training within a core system-based medical curriculum (General Medical Council, 2009). The World Federation for Medical Education (WFME) requires medical schools to integrate their curricula (WFME, 2012). Integration has been accepted as an important educational strategy in medical education (Harden, 2000; Grant, 2014). However most medical schools in Nigeria have not adopted integration in teaching the basic and clinical sciences (Gukas, 2007; Olapade-Olaopa *et al.*, 2016).

The Integration of the foundational sciences provides an opportunity for demonstrating to learners the significance of foundational sciences to medical practice; it improves retention and transfer of knowledge to clinical practice and increases the interest of learners in foundational sciences (Quintero, Vergel, Arredondo, Ariza & Gomez, 2016). Integration can occur within the context of discipline-based, outcome-based or competency-based curricula (Harden, 2000). The level of integration adopted within a curriculum depends largely on the stakeholders and the resources available for implementation. It is, however, generally accepted that integration is necessary in the medical education curriculum (Grant, 2014).

2.3.2 Steps in the Integration Ladder

Harden (2000) described eleven steps in the integration ladder, starting from isolation (lack of integration), awareness, harmonization, nesting, temporal co-ordination, sharing, correlation, complementary, multi-disciplinary, interdisciplinary and trans-disciplinary approach (full integration). At the bottom of the ladder is isolation or lack of integration in which each subject is taught as an entity without knowledge of what is being taught in other disciplines. This is what typically happens in a traditional-model curriculum. At the stage of awareness, harmonization and nesting, there is increasing interaction between departments, but the subjects are still taught separately. In awareness, the teachers are aware of what is taught in the other disciplines, but subjects are not harmonised. At the stage of harmonisation, there is interaction amongst the teachers both informally and formally about the content of instruction, but the subjects are still taught as individual disciplines. This is also known as the connection stage by Fogarty (1999). Nesting involves identifying generic skills that cut across other subjects and teaching it as a subject on its own while other subjects are taught individually. Temporal coordination is also known as parallel teaching. The timetable is designed in such a way, that similar topics are taught at the same time, but students are left to make the connections by themselves. Steps five to eleven emphasize increasing levels of integration across disciplines and around common themes until full integration is achieved (Harden, 2000). Similar steps in integrating the curriculum were also described by Fogarty (1999). There are some overlaps between Fogarty's ten ways to integrate the curriculum, and Harden's integration ladder.

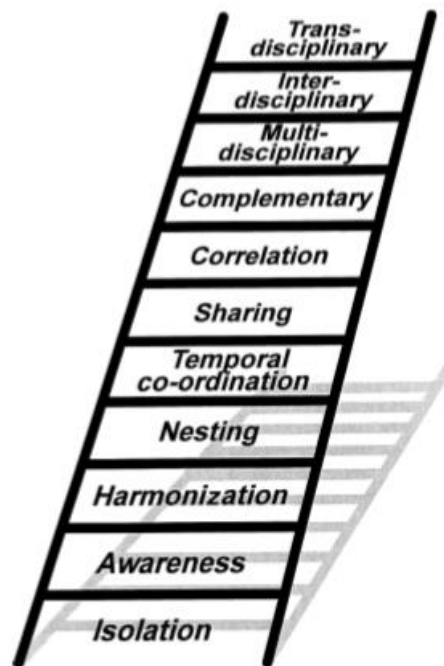


Figure 3. The integration ladder (Harden, 2000)

2.3.3 Benefits and Barriers to Integration within the Curriculum

Studies have shown that students, exposed to integrated teachings, tend to perform better in clinical assessments than those exposed to discipline-based teaching (Worley, Esterman and Prideaux, 2004; Basu, Das & Chowdhury, 2015). The need to demonstrate to learners the significance of foundational sciences in medical practice, improve retention, ease the transfer of knowledge to clinical practice and increase the interest of learners in foundational sciences, makes integration imperative (Quintero *et al.*, 2016). Furthermore, students are more likely to be motivated regarding medicine if there is early exposure to patients and if clinical cases are introduced in the teaching of foundational sciences, rather than experimental animals and cadavers, as is often done in discipline-based teaching (Harden, *et al.*, 1984; Worley *et al.*, 2004). The cognitive domain of the Blooms' taxonomy describes six levels of educational objectives. These are in increasing level; knowledge, comprehension, application, analysis, synthesis and evaluation (Gravet, 2005). Integration also allows higher levels of reasoning on the Blooms' taxonomy scale. Integration promotes effectiveness in the teaching and learning process and improves communication and collaboration amongst the faculty (Muller, Jain, Loesser & Irby, 2008). The benefits of integration within the curriculum far outweigh the restraints associated with it. Muller *et al.* described the challenges observed with integration as: reluctance of faculty to shift to new integrated teaching, getting faculty to communicate with one another and truly achieving interdisciplinary content

(Muller *et al.*, 2008). These same challenges were observed by Hasan & Sequeira (2012) in teaching physiology in an integrated fashion. In addition, issues about students' assessment and curricular content sequencing were also raised by faculty in the study by Hasan and colleague.

2.3.4 The Role of teachers in Effective Implementation of Integration

Integration obviously requires cooperation amongst stakeholders for it to be successful. It also requires higher and better communication and participation of staff in the curriculum design and planning. Full understanding, support and commitment of staff are required for effective integration (Atwa & Gouda, 2014). Curricular change, without active involvement of the teachers, have not brought about the desirable outcome in integrating the foundational sciences (Hopkins *et al.*, 2015; Jones *et al.*, 2001). The learning needs of the foundational science teachers (targeted need assessment) need to be addressed and the level of integration desired must be understood by the teachers (Kern *et al.*, 1998).

Since the teachers are critical stakeholder, it is imperative to explore the perspectives of the foundational sciences teachers about integration of courses, before developing and introducing this new educational strategy at the College of Health Sciences, Obafemi Awolowo University (CHS, OAU) Ile-Ife, Nigeria.

2.4 Curriculum Models in Medical Education

2.4.1 The traditional model

The traditional model curriculum is the medical curriculum that has been in use since inception of modern medicine. The traditional model curriculum is described as teacher-centred, information gathering, discipline-based, hospital-based and has a rigid structure and apprenticeship (Jones *et al.*, 2001; Olapade-Olaopa *et al.*, 2016). In a traditional model curriculum courses are taught discreetly as stand-alone subjects without knowledge of other subjects and how they interrelate. The traditional curriculum is now recognized to be static and outdated and produces graduates that are ill-equipped to handle the changing health needs of the community (Jones *et al.*, 2001; Grant 2014). Furthermore, some studies have enumerated the challenges associated with the traditional-model curriculum. These are: disconnection between knowledge in preclinical years and clinical years, fragmentation of knowledge, overload of the curriculum in excess of the requirement for the programme and loss of motivation from the students' side (Harden *et al.*, 1984; Hasan & Sequeira, 2012; Olapade-Olaopa *et al.*, 2016). Internationally there has been a paradigm shift from the traditional model curriculum to a more innovative model of curricular structure (Grant, 2014).

2.4.2 The SPICES model

Harden *et al* (1984) described an innovative curriculum known as the SPICES (which is an acronym for the six educational strategies) model curriculum. The SPICES model comprises six educational strategies. These are student-centred, problem-based, integrated, community-based, elective and systematic strategies (Harden *et al*, 1984). In a student-centred approach to teaching and learning, students take control of their learning processes, learning resources, the sequence, pace at which they learn and are responsible for their own learning (Harden *et al.*, 1984). Problem-based learning enables learners to develop problem-solving skills and enhances the integration of a body of knowledge acquired at different levels of training. It also allows active participation of learners in the decision-making process of patients' management. Integration of subjects and community-based training are integral parts of the SPICES model. Community-based training affords students the opportunity of learning and interacting in the community where they may eventually practise. Options for electives allow students to have experience in other institutions or faculties and to have an in-depth knowledge of a subject of their interest. In the systematic approach to learning, the lists of teaching and learning experiences and clinical cases that the students are expected to know are planned, documented and not just left to chance, as in the traditional apprenticeship approach.

As posited by Harden *et al.* (1984) there is a continuum between the SPICES MODEL and the traditional model. Where an institution lies within the continuum depends on the institutional goals and objectives, as well as some practical and logistic considerations, for example, resources available, staff expertise, experience in implementation and the political will of the stakeholders (Harden *et al.*, 1984). The following table describes the SPICES model compared to the traditional model.

Table 2.1: The SPICES and the Traditional model Curriculum

The “SPICES” Model:	Traditional Model
S: Student-centred	Teacher-centred
P: Problem based	Information gathering
I: Integrated	Discipline-based
C: Community based	Hospital-based
E: Elective	Uniform or rigid structure
S: Systematic	Apprenticeship

2.4.3 The PRISMS Model

The PRISMS mode is an organizational framework for current medical curricula and was proposed by Bligh, Prideaux & Parsell (2001). Each element of the framework is as follows:

P: Product-focused, it emphasizes appropriate clinical work and professional behaviour acquisition

R: Relevant learning planned around outcome

I: Inter-professional or multi-disciplinary programme

S: Shorter duration of courses and teaching (through full integration)

M: Multi-site location for wider exposure of students, preferably in primary care settings.

S: Symbiotic or integrated

This framework emphasizes teamwork based on mutual respect and understanding (Bligh *et al*, 2001).

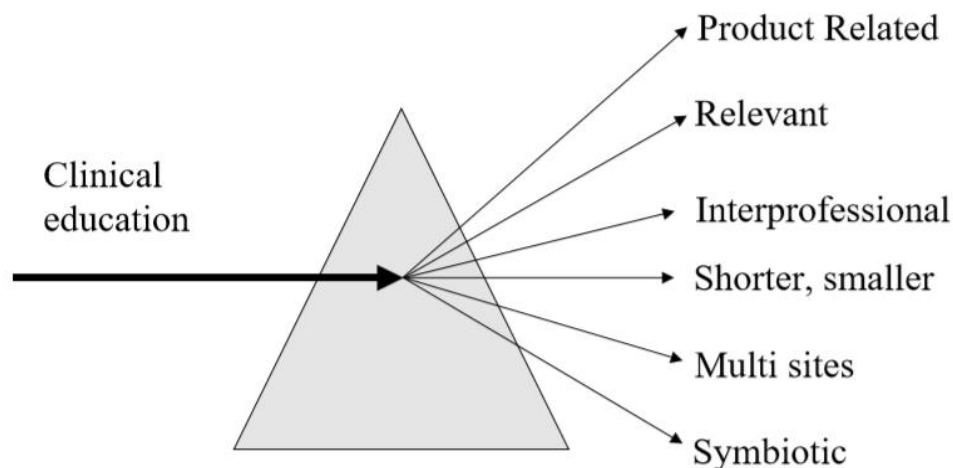


Figure 4. The PRISMS model (Bligh, Prideaux & Parsell, 2001).

2.4.4 Outcome-Based Curriculum

Outcome-based education (OBE) is defined by outcomes that the students are expected to obtain upon completion of a learning intervention (Prideaux, 2003). OBE has been described by some authors as the most important innovation in medical education in the last few decades (Harden, 2015). Furthermore, OBE curricula concentrate on equipping learners with competencies that are required for practice. In OBE, the expected learning outcomes and competencies required of the students are described in the curriculum and this is based on the health needs of the community the graduates are to serve (Harden, 2015). OBE promotes a student-centred learning approach and ensures that learners have the capabilities necessary to provide high quality health care delivery services (Frank, Snell, Cate, Holmboe, Carraccio, Swing, Harris, Glasgow, Campell, Dath, Harden, Iobst, Long, Mungr, Richardson, Sherbino, Silver, Taber, Talbo & Harris, 2010; Gruppen *et al.*, 2016). Furthermore, in OBE the learning outcomes determine the content, teaching and learning methods and other educational activities necessary to achieve the outcomes. Learning outcomes must be specific, measureable, achievable, result-oriented, time-bound and aligned to students' assessment. However, an outcome-based curriculum specifies the expected outcome, but not how to achieve the outcome (Harris, Snell, Talbot & Harden, 2010). A further improvement on outcome-based education is competency-based education that addresses some of the short-comings of OBE.

2.4.5 Competency-Based Curriculum

Competencies are defined as sets of qualities, skills and understandings that an institution requires its graduates to acquire or satisfy before graduation. Competency-based medical education (CBME) focuses on patients' healthcare needs to decide which outcomes and competencies doctors need to have at different levels of training to be able to handle patients adequately (Harris *et al.*, 2010). CBME emphasizes a student-centred approach to learning with active student engagement. There is flexibility of design and assessment is constructively aligned with learning activities. Moreover, integration is a crucial component of CBME. CBME offers real-life professional experience to learners and prepares them for life-long learning (Harris *et al.*, 2010).

The CanMED (2005) Physician Competency framework is an educational framework for physicians and describes seven roles that lead to optimal health and health care outcomes. These include: medical expert (central role), communicator, collaborator, manager, health advocate, scholar and professional (Frank, 2005). The competencies determine the content and how the curriculum will be organized in this

framework. This framework has been adapted and implemented by several medical schools over the world.

2.5 Summary

Various changes in medical curricula have been influenced by the health and healthcare needs of the society. Different curricular models have integration as an integral part of the curriculum. Whatever curricular model is adopted by an institution, integration has been recognised as an important component of an effective educational strategy. The method of integration adopted by an institution depends on the stakeholders as well as the capability and the willingness of the staff to fully implement the curriculum. For a new curriculum to be effective, the learning needs of staff in relation to how integration within the curriculum could be achieved effectively, need to be addressed.

Chapter 3 presents the methodology applied to explore the perspectives of foundational science teachers on integration of courses within a discipline-based curriculum.

CHAPTER THREE: METHODOLOGY

This chapter presents the methodology employed in this study to explore the perspectives of foundational science teachers on the integration of courses within a discipline-based curriculum. The research question and the research approach that was followed, as well as the data collection and analyses are discussed. The data management processes and ethical consideration are also addressed.

3.1 The Research Question

The research question for this study was: What are the perspectives of foundational science teachers at the CHS.OAU, Ile-Ife, Nigeria medical school with regards to integration of courses within their discipline-based curriculum?

3.2 Aim of the Study

The aim of the research was:

- to explore the perspectives of foundational science teachers on integration of courses within a discipline-based curriculum.

3.3 Objectives

The specific objectives were:

- to explore the understanding of foundational science teachers on the term ‘Integration within the curriculum’
- to explore the perspectives of foundational science teachers on the need for integration
- to identify the perceived barriers and enablers when integrating the foundational sciences, and
- to identify possible strategies by which integration can be implemented.

3.4 The Research Approach

A qualitative approach with an interpretive paradigm was used in this study to explore the perspectives and understanding of foundational science teachers on integration of courses within a discipline-based curriculum (Merriam, 2009; Denscombe, 2007). The aim of a qualitative approach is to understand the perspectives and experiences of participants in their multiplicity of opinions (Gill, Steward & Treasure, 2008). An interpretive paradigm is focused on understanding the world through the subjective

experiences of participants and relying on the relationship between the participants (Merriam, 2009; Denscombe, 2007).

3.5 The Role of the Researcher

The principal researcher of this study is a staff member of the Faculty of Basic Medical Sciences, CHS, OAU, Ile-Ife, Nigeria. Although a member of the faculty, I am not directly involved in teaching the foundational sciences, but I am an active member of the curriculum review committee. I interacted freely with the participants and discussed issues relating to the curriculum even in informal settings. It was, therefore, necessary for me to be aware of my role as an inside researcher and to keep a reflective journal of my feelings during the data collection process (O'Brien, Harris, Beckman, Reed & Cook, 2014). In researcher-participants interaction subjectivity cannot be totally removed as the researcher becomes an instrument in the research process (Merriam, 2009). Advantages of being an inside researcher, however, include: being seen as part of the group and not a stranger and awareness of the on-going issues about curricular review at the College. A disadvantage was being seen as an advocate for the curricular review and possible bias in the interpretation of data (Denscombe, 2007). As an inside researcher, I was cognizant of my role, perspectives and feelings during the discussion. (Merriam, 2009). The researcher acknowledged the presence of personal bias and feelings and, therefore, a reflective journal was kept throughout the period of the study (Addendum A).

3.6 Research Methods

The researcher explored the perspectives and understanding of foundational science teachers on integration of courses within a discipline-based curriculum, using focus group discussions (FGD). The FGD is a well-suited methodology to explore attitude, behaviour and beliefs, and is particularly useful in exploring new and emerging social phenomena where boundaries have been less well defined (Barbour, 2005). Thus, the use of FGDs in the context of this study makes it possible to explore the values, assumptions and beliefs attached to integration within the curriculum of foundational science courses in CHS, OAU, Ile-Ife, by the foundational science teachers. The participants in the study were well known to one another and the researcher. The focus group discussions were transparent and honest. Participants freely expressed themselves about their understanding and perceptions about integration. The researcher also used the opportunity of the focus group discussion to clarify statements to avoid misconception and did this by probing questions.

3.7 The Focus group Discussions (FGD)

Qualitative data was collected by making use of FGDs. The FGD interview prompts were designed to align with the research question. The prompts were refined by the researcher and the study supervisors before the conduction of the interviews. FGD can be seen as ‘an interview on a topic with a group of people who have knowledge on the topic’ (Merriam, 2009 p.93). Participants were selected on the basis of their experience of the topic of interest (Rabiee, 2004). FGD’s are particularly useful when a smaller number of people are available to be accessed for a study and data can be collected from multiple individuals with various perspectives concurrently (Barbour, 2005). FGD was used in this study because of the small number of teachers in the foundational sciences, and to ensure that most of the teachers had the opportunity to participate in the study.

3.8 Study Population

The FGDs were organized with heterogeneous groups of teachers, males and females selected from three departments (Anatomy, Physiology and Biochemistry) from the Faculty of Basic Medical Sciences, CHS, OAU, Ile-Ife. These are foundational science teachers that are involved in teaching Anatomy, Physiology and Biochemistry to medical students in the second and third year of the MBChB programme. All twenty-six foundational science teachers were invited to participate in the discussion. The foundational science teachers are a mix of teachers with medical training background and those without medical training, but with appropriate qualifications in their field of expertise.

3.9 Sampling

The sample was the same as the study population. Participants were invited to take part in the interviews by contacting them face-to-face in their offices or by telephone conversation. The researcher explained the aim, objectives and purpose of the study to the teachers and their consents were obtained. Twenty-one out of the twenty-six teachers in the basic science departments participated in the study. Other expected participants were not available because they were either on approved leave or out of town.

3.10 Data collection

Three FGDs were conducted with the 21 teachers that took part in the study. Each group consisted of seven teachers made up of the staff from the three departments. The participants in each of the departments are exposed to similar teaching modules and curricular content and, therefore, related well with one another (Tavakol & Sandars, 2014). Each interview session was conducted by the researcher,

who is also involved in the curricular review process in the faculty. The interviews were conducted in an appropriate meeting room in order to ensure privacy and a quiet environment (Tavakol & Sandars, 2014). The normal process for a FGD was followed, including explaining the aims and objectives of the study and obtaining the participants' consent, establishing of ground rules, and setting the appropriate frame for the discussion. The discussions were moderated with the use of a pre-developed interview guide (Addendum B).

During the discussion, probing questions and clarifications were sought based on the participants' responses. Each group's discussion lasted for approximately one hour. The FGD sessions were audio-recorded, using a digital recorder, with the full consent of all participants (O'Brien, *et al* ,2014). Refreshments were served after each session.

3.11 Data Management

The FGD sessions' recordings were downloaded from the recorder into the researcher's password protected computer. Subsequently, the electronic file was sent to the transcriber by e-mail. The completed transcripts were sent back to the researcher with a unique identifier and stored on the PC which was accessible only to the researcher. After the transcripts were checked for accuracy by some of the participants that were interviewed, the recordings were deleted from the transcriber's computer.

3.12 Data Analysis

An inductive approach was followed in the process of analysing the data (Merriam, 2009; Denscombe, 2007). The researcher read and re-read the verbatim transcripts in order to familiarize herself with the content (Denscombe, 2007), and then coding was done. The first step was an open coding of every line of the text documents, which involved the identification of potential useful concepts. During this process, the data were fragmented into various conceptual components. Then the data were reread and ideas and thoughts that came up, were recorded (Merriam, 2009). The next step was focused on coding. This involved defragmenting the text as coding continued and the same set of concepts were pulled together, looking for relationships between concepts in order to form categories. These processes involved constant comparison as each text was coded, each theme was considered as it appeared and whether it related to previous coded texts (Denscombe, 2007). The researcher was constantly aware of biases that could potentially come from personal judgment and values during the analysis of the data.

Emphasis was placed on the emergence of themes from the interaction with the data as opposed to preconceived codes (Denscombe, 2007). Themes were also discussed with supervisors during the process of development. Four major thematic categories were generated around perceptions on the assumptions

and beliefs of the foundational sciences' teachers about the integration of foundational sciences at the CHS, OAU, Ile-Ife (Tavakol & Sandars, 2014).

3.13 Quality Criteria

The steps taken to ensure the trustworthiness of the data were as follows:

3.13.1 Credibility of Data

Credibility of data refers to how close to reality the findings are. It could be enhanced by prolonged engagement with participants and asking participants for feedback on the findings (Merriam, 2009; Denscombe, 2007). The data used for this study were obtained from the transcript of the focus group discussions and the field notes made during the interviews. Three different discussion sessions were held among the foundational science teachers. The interviews continued until no new information was obtained from participants. There was prolonged engagement with participants and some of the participants were asked to check the transcriptions for correctness of the data. The supervisors also scrutinized the findings of the study. It is assumed that participants truthfully responded to the interview questions during the focus group discussions by describing their understanding, beliefs and perspectives on the integration of foundational science courses. All the procedures that were followed in data collection and analysis contributed to the credibility of the study. An extensive description of the phenomenon being studied and supervisor's scrutiny also aimed to increase the credibility of the findings.

3.13.2 Transferability

Transferability refers to the degree to which the study's findings could be generalised to other situations (Merriam, 2009). Possible transferability was strengthened in this study by the extensive description of the findings and context of the study. The whole population of teachers in the foundational sciences were used for this study. The findings in this study were compared with findings from different settings found in the literature. This study is a small-scale study and the conclusions from the study may be limited to similar contexts. The findings may potentially contribute to the body of knowledge in the health profession regarding the perspectives of teachers on integration within the curriculum.

3.13.3 Dependability

Dependability is the extent to which the same findings will be obtained if the same participants are interviewed again or the study repeated in a similar context (Tavakol *et al.*, 2014). The FGD continued until no new information was obtained during each session. The data were analysed until no new themes emerged. An iterative approach to data collection and analysis was applied.

3.13.4 Confirmability

Confirmability refers to the extent to which the research findings can be free from the influences of the researcher (Denscombe, 2007). The researcher was aware of biases that could come from personal judgment and values during the analysis of the data. Therefore, a reflective journal was kept throughout the period of the study. Analysis of the data was based on the emergence of themes from the interaction with the data as opposed to preconceived ideas. The researcher was mindful of data that did not fit and alternative explanations were suggested. The transcript data were compared with the field notes. The findings in this study were also discussed with peers and the supervisors. All the steps taken in the process of this research were documented.

3.14 Ethical Considerations

Ethical clearance was obtained from the Stellenbosch University Health Research and Ethics Committee (HREC Reference #: S18/03/066 dated 25/6/2018) and Institute of Public Health, Health Research and Ethics Committee OAU, CHS (Ref IPH/OAU/12/1036 dated 16/7/2018) before the commencement of the study. Written informed consent was obtained from each participant. Participants were informed of their right to withdraw at any point during study. All data collected during the study were handled according to local and international standards for data security and confidentiality. No personal identifier was used at any stage of the study. The data was stored on a personal computer that was password protected. There was no risk or direct benefits to study participants. The transcriber signed a declaration of confidentiality.

The findings of this research will be made available to the Faculty and the College locally and at a later stage it will be published in a reputable educational journal for public dissemination.

3.15 Summary

Chapter three described the research question, the aims and objectives, the research design and methodology. Data management, analysis, quality criteria and ethical considerations were also described. In chapter four an outlay of the results will be given.

CHAPTER 4: FINDINGS

Chapter four presents the findings of the focus group discussions (FGD) about the perspectives of foundational science teachers on integration within the curriculum. The themes and categories reflected their knowledge and perceptions about integration.

4.1 Findings

An inductive approach was used for code recognition during the data analysis process (Merriam, 2009 p.15). Four themes emerged from the categories identified during the data analysis process. These were knowledge of integration, perception on the need for integration, enablers and barriers of integration in the foundational sciences and suggestions on how integration could be implemented at the College.

4.2 Themes and Categories

In the next section themes and categories that emerged from the data will be presented one by one.

4.2.1 Theme 1: Knowledge of Integration

There were two categories under the theme knowledge of integration. These were the understanding of integration within the curriculum and methods of integration. See Table 1 below.

Table 4.1 Theme and categories: Knowledge of integration.

Theme 1:	Category 1: Understanding of integration within the curriculum
Knowledge of integration	Category 2: Methods of integration

4.2.1.1 Category 1: *Understanding of integration within the curriculum*

Participants expressed some knowledge and understanding of integration within the curriculum. They believed it was about bringing together different aspects of the foundational sciences' courses under a single course with a central theme, so that the courses could be taught simultaneously in order to foster better understanding by the students.

.....I think curriculum integration has to do with bringing together different aspects of the curriculum like anatomy with physiology how they can be taught as a single course and reaching a central theme. For example, if we have anatomy of the brain cell, biochemistry, physiology, we want the student to be able appreciate how the brain functions in term of the anatomy, physiology and biochemistry and see the brain as a single unit so integrating the curriculum in that way.

.....FGD_P2_Biochemistry Lecturer

Integration was further described as a way of structuring the basic sciences' teaching in such a way that the same topics are taught across disciplines at the same time, but from different points of view.

I also feel that integration of curriculum in basic science have to do with structuring the teaching of different aspect of what the student need to learn by different departments in such a way that everybody is speaking about the same thing from the different point of view of their field. For example for this week or for a period of two weeks we are supposed to be talking about cardiovascular systems we in the anatomy, we talk about it in the anatomical point of view, physiology the same thing from their own point of view , biochemistry department from their own point of view, that goes for all systems.

..... FGD_P6_Anatomy lecturers

Participants described integration as synchronising content in a way to foster understanding by the students. The teachers expressed the idea that integration is wholesome teaching presented in such a way as to make connections among the disciplines. The following excerpts from the teachers' FGD confirmed this:

the situation in which the three courses are synchronized such that the student is able to get a better grasp, is able to integrate or bring together the content of each of those courses to foster understanding and boost knowledge.

.....FGD_P5_Biochemistry Lecturer

.....it's kind of wholesome teaching that is when you bring everything together as a unit and they are able to present it as each interrelated or related to all the other arms within that same curriculum

.....FGD_P3_Anatomy lecturer

4.2.1.2 Category 2: Methods of integration

Participants expressed their knowledge of the methods of integration within the curriculum. Participants stated that integration was not limited to foundational sciences alone, but were also concerned with clinical sciences. Some of them shared their experiences on curricular integration methods that they had been part of or had seen used in other universities.

... Integration will not be limited to physiology, anatomy and biochemistry maybe in the clinical too there will be integration

.....FGD_P5_Biochemistry Lecturer

I am going to share the experience of =OOU= what we used to do is that the three departments will sit together to itemize all the topics in anatomy, physiology and biochemistry and then marry them in a particular way, if we are looking at the cerebrum in anatomy we will also be looking at cerebral functions in physiology and then biochemistry the same thing and what it did then was that it help us to be able to do neurology within six weeks. It also helps everyone to finish at the same time so we won't be getting ready for MB and a department will be lagging behind.

.....FGD_P3_Anatomy lecturer

...I have not particularly been involved in an integrated curriculum in a university, but I have had the opportunity of been at a place where such was the system in the training of medical students, that is the university of X. Their lectures especially when medical training starts in year 2 is in such a way that we have perfect integrated lecture system. The 1st exam that the students take after the first 4 weeks or 8 weeks just one single exam, they call it Cell Body Defense /Integrated basic sciences, one single exam that will comprise of anatomy physiology biochemistry all in one paper at one sitting and there after we have different exam by different departments

.....FGD_P1_Anatomy lecturer.

4.2.2 Theme 2: Perceptions of the need for and benefits of integration within the curriculum Participants unanimously supported the idea of integration of the foundational courses and reiterated the significance of integrating the three foundational science's courses in the faculty. Participants believed that integration would foster better understanding of the courses, encourage interdisciplinary teaching, removes curriculum overload and checks students' absenteeism. The theme and categories are shown in Table 4.2 below.

Table 4.2 Theme 2 and categories: Perceptions on need and benefits of integration.

Theme 2:	Category 1: Better understanding of course by students
Perception on need and	Category 2: Interdisciplinary teaching
benefits of integration	Category 3: Decrease curriculum overload
	Category 4: Better class attendance

4.2.2.1 Category 1: Better understanding of the courses by the students

Participants believed that integration would enhance better understanding of the courses by encouraging students' participation in the learning process. They also believe that integration would help students connect knowledge and relate basic knowledge to clinical scenarios. The excerpt below attest to this.

..... it will help the students to participate in the learning process such that they are not totally dependent on the teacher they want to be part of it all, they want to look for ways by which they can learn by themselveswhen we put everything together it stimulate their interest, it help them see why they need to learn and why they must also be part of learning process.And I also think that it's going to help to integrate knowledge, it will help them to trace clinical problems to basic science roots, everybody has said students think biochemistry is an abstract (laughs in the background) .

FGD_P5_Biochemistry Lecturer

They also believed that integration would boost students' interest in the foundational courses. Furthermore, participants stated during the course of the interview that integrated curriculum would make the courses more realistic and teaching more interesting for both students and teachers. Excerpts from interactions with the participants are shown below:

.....it will make the teaching more interesting both to students and to the teachers .It becomes more realistic what we are trying to teach. So it is necessary. Like today I was talking to them about muscle function I was teaching carbohydrates I came to glucose and the whole of glucose in the body and all that and I mentioned footballers there is a lot of physiology there .It becomes more realistic biochemistry like I said transform from unrealistic or abstract as students use to say to be more realistic and more applicable to everyday life that they understand.

.....FGD_P3_Biochemistry Lecturer

Participants further noted that integration could also enhance and reinforce learning with better application of knowledge by the students. They also remarked that integration could improve retention of knowledge. This is substantiated by statements as:

.....it even enhances learning for the students because they are hearing the same thing in anatomy, they are hearing the correlation of it in physiology and biochemistry as in it is a kind of reinforcement of learning. So if they hear the same thing in three different places and they din relate the thing they are hearing from all those places together, it helps them to learn that thing better and faster and retention is also high.

.....FGD_P4_Anatomy lecturer

.....Anatomy is about structure, physiology is about function and since in physiology we know organ don't work in isolation so if a particular system is being taught in anatomy I think it is better the same is taught in physiology so that the students can understand better or have a better grasp or full understanding of the topic that is being taught so I think it is a good idea

.....FGD_P2_Physiology Lecture

4.2.2.2 Category 2: Interdisciplinary teaching

Participants believed that integration could promote holistic interdisciplinary teaching where courses could be synchronized by teaching the same topic or system in the three departments, thus, saving time and achieving the desired outcome. The teaching interactions may be arranged in a way that rescheduling becomes difficult, so everyone is disciplined to work within the time frame of the lectures. The following statements gave credence to this.

....the lectures are so well synchronized in such a way that you have different departments talking about the same thing in their different perspective and what it does quite agree with P3, it saves time a lot, if curriculum is prepared in that format, it is not possible to reschedule because you know you are under obligation to finish lecture to your students on a particular area of a body system within a specified time....

.....FGD_P4_Anatomy lecturer

.....So all students will be looking at the subject holistically and it will make them to comprehend the subject matter better....

.....FGD_P6_Physiology Lecture

..... *Integration will cause lecturers to be regular in class and stop lecture shift towards examination period.*

.....**FGD_P4_Physiology Lecture**

4.2.2.3. Category 3: Decrease curriculum overload

One of the participants remarked further that integration of foundational sciences' courses could decrease curriculum overload by removing some unnecessary topics that were not really important to the students in medical training. Quotation to buttress this point is shown below:

.....*I think there is need for curriculum integration. Number one it removes a lot of unnecessary things that we load our students with.*

.....**FGD_P3_Biochemistry Lecturer**

4.2.2.4. Category 4: Better class attendance

Furthermore, participants noted that curriculum integration could possibly assist to keep students interested and them attending more classes. They are of the opinion that students would be encouraged to attend lectures when current lectures are based on the knowledge acquired from previous lectures, thus students' absenteeism would be decreased. This is substantiated by such statements as:

..... *some students have not been coming to class and they will still pass so but if this integration is introduced, I am very sure apart from the fact that students will show more interest in what we are teaching them it will also be fascinating to them that we have learn biochemical aspect of this, or probably they have learnt the physiological they will want to come to biochemistry and will want to listen to biochemist how the same issue will be discussed so this is my contribution.*

.....**FGD_P6_Biochemistry Lecturer**

4.2.3 Theme 3: Enablers and barriers to integration

Even though integration is not being practised formally in the curriculum the foundational sciences' teachers recognized an enabler within the system that could encourage integration within the curriculum. They also enumerated factors that could be seen as barriers to integration at the College. Table 4.3 shows the theme and categories.

Table 4.3 Theme 3: Enablers and barriers to integration

Theme 3:	Category 1: Enabler to integration: Time-tabling
Enablers and barriers to integration	Category 2: Barriers to integration
	Subcategory 1: Inadequate facilities and lecturing space
	Subcategory 2: Large groups of students
	Subcategory 3 : Inadequate staffing
	Subcategory 4 : Lack of cooperation amongst teachers

4.2.3.1 Category 1: Enabler to integration: Time-tabling

The main enabler pointed out by the participants was time-tabling. Some participants felt that the way the time-table was currently structured for the foundational sciences allowed for some form of integration of topics even though the subjects were taught separately by individual departments. They also suggested that further interactions amongst the departments would increase the level of integration achieved. Some of the statements by participants are shown below:

....as a matter of fact I think in the curriculum in this institution OAU, the curriculum has been designed in such a way that you know the anatomy of the body, anatomy is going on then you superimpose it upon the function and the biochemistry but you may need to fine tune it in such a way that the curriculum is designed that one have the knowledge of the anatomy of that system then systematic teaching in such a way that when the system is been handled in one department the other department will synchronize with that system. And if it is in using organ, when the organ is being taken, anatomy leading then biochemistry and physiology will follow up with that same organ so it can be through organ system structure, anatomy taking the lead.

.....FGD_P5_Physiology Lecturer

.....from my experience, with the way the curriculum is arranged , most of our courses are being run concurrently, the anatomy begin ,with the structure of the heart, so the way we prepare our time table, physiology also run the same physiology of the heart and likewise the biochemistry. I think if the timetable is prepared of which we run the same time table together by the time you are finishing with certain system in the body the other department also are ending theirs ... you will discover that taking the examination of this region goes all around the same time

.....FGD_P2_Anatomy lecturers

4.2.3.2 Category 2: Barriers to integration at the CHS, OAU

Possible barriers expressed by the participants that needed to be addressed for integration of the foundational science curriculum to be successful are: inadequate facilities and lecturing space, large groups of students, inadequate staffing and lack of cooperation amongst teachers in different departments.

4.2.3.2.1 Subcategory 1: Inadequate facilities and lecturing space

Facilities and lecturing space problems were major challenges that respondents believed would serve as obstacles to the curricular integration process. Most of the participants opined that there were no facilities in place that could support the curricular integration process. It was discussed during the course of interviews that the college did not have adequate lecture theatres that could accommodate the groups of students who were admitted into the college in sessions. These could have been affecting lecturing processes over the years. Quotations below are some of the excerpts from the interviews:

..What we lack here is spacing, most of our lectures, you give lectures in laboratories and where facilities might not be comfortable and convenient to handle

.....FGD_P5_Anatomy lecturers

.....in integration in everything, the lecture theatre is essential, minimum of three lecture theatres are needed as we are talking now, it's only one that is in this institution and people are hanging in laboratories and you want to integrate things, we need minimum of at least three lecture theatres so that it will be easy to teach these subjects. It is an area of deficiency in the basic sciences....

.....FGD_P2_Physiology Lecturer

4.2.3.2.2 Sub-category 2: Large groups of students

More so, it was mentioned during the discussion that due to inadequate lecture space coupled with large numbers of students, classes were usually overcrowded. Large groups of students make teacher-student interactions less effective. This could further over-burden available facilities and the staff which in-turn could affect the performance of the students. Some excerpts of the discussions are shown below:

....You know the integrated curriculum is supposed to emphasize small group learning, small group case learning where all the students are involved in the learning process now the present situation that we have cannot work where we just lump about 300 students in one classroom and

we teach them there is really no way they can be actively involved in the learning process. So if we are going to adopt the integrated curriculum we'll really need to sort ourselves out as far as class is concerned, we have to group the students into small clusters

.....FGD_P1_Biochemistry Lecturer

..... Integration good as it is, I don't think we are anywhere near running a good integration system, I don't know what the UNESCO standard is that is teacher to student ratio, but we have exceeded it in this university. A situation where someone is teaching a class of 250 students, no public address system.....

....FGD_P4_Physiology Lecturer

4.2.3.2.3 Sub-category 3: Inadequate staffing

Some of the participants mentioned that inadequate staffing would be another major barrier to integration. Participants remarked that presently the number of staff available for the workload in each department was inadequate considering the population of students under their watch. More so, some participants believed that the uneven distribution of teachers amongst sub-specialities in the foundational sciences might impact negatively on integration within the curriculum. Some excerpts of the discussions are shown below:

.....the three departments are not equally staffed for example if you have a renal physiologist, you should have a renal anatomist you should have a renal biochemist. I remember my experience when I needed to start neuro-physiology, they have not started anything neuro anatomy and neuro being a very complex and the widest of physiology. I have some residual knowledge of anatomy, I had to go to functional anatomy before talking of physiology which is my real business.

.....FGD_P1_Physiology Lecturer

Inadequacy in staffing is another thing, we need enough staff so that the work can be done. If as of today we have more lectures in one department than another and you want the two of them to go at the same pace, just one person cannot cope.

.....FGD_P4_Physiology Lecturer

4.2.3.2.4 Sub-category 4: Lack of cooperation amongst teachers in different departments

Furthermore, during the course of the discussion it was noted that different departments do not see themselves as co-partners in training medical students, which could affect the teaching, learning and

implementation of curricular integration processes within the College. As one of the participants put it “not only the courses are compartmentalized, the teachers also are”. Students also did not see the need for foundational sciences, because of the way the College is currently structured. The following statements by participants below confirmed this point:

..... yes one major challenge I know it happens in every medical school but it looks heightened around here, it's that it is not only our courses that are compartmentalized there is a big berlin-wall between our departments and faculties. And because of that it look as if every faculty is at dagger's draw against the next faculty, clinical sciences will want to have all the six years if it is possible at the detriment of other faculties and things like that. I think that is because we have not seen ourselves as co-partners in building medical students.

.....FGD_P4_Physiology Lecturer

..... now you can see that there is a degree of animosity within the College, it may be a subtle one but at one point in time it will explode. Because as I told my colleague that right from the inception the students have been classified as clinical students not as medical students because the matric number is CLI, CLI is clinical. Meaning that before they get to their side, basic medical sciences are just assisting in training these students. The first thing is that we have to go back to the foundation to resolve the naughty issues that we have so that we all see that these students belong to the College so that we can now work in harmony and see to the best way we can train these students

.....FGD_P3_Anatomy lecturers

4.2.4 Theme 4: Suggestions in order to implement curriculum integration

The participants offered suggestions by which integration could be implemented. These included: institutional strategic planning, appropriate curricular reviews, appointment of more teachers and incentives for teaching.

Table 4.4: Theme 4 and categories

Theme 4:	Category 1: Institutional strategic planning
Suggestions in order to implement curriculum integration.	Category 2: Appropriate curricular reviews
	Category 3: Appointment of more teachers
	Category 4: Incentives for teaching.

4.2.4.1 Category 1: Institutional strategic planning

Participants suggested that long term planning was necessary before integration could be commenced by the College. They also requested that adequate administrative structures should be put in place by the College. The participants felt that the process should be driven by the leadership of the College and not just by a department or a Faculty member. They further suggested that foundational science departments could come together to brainstorm on how the course contents and timetables could be harmonised to draw a horizontal integrated curriculum for the foundational sciences that would improve teaching and aid students' learning at the College. However, it was noted that this would require serious commitment and devotion by the departments to achieve the set goals. This notion is validated by utterances like:

..... so I think there is a place for preparation, for planning and it has to do with the three departments involved coming together drawing timetables I mean the course content now if we are talking about it being organ-based, system- based .It has to do with each department sitting down and designing the course content and how the three can be integrated can be synchronized so there is need for planning and the teachers coming together coming to design the course content.

.....FGD_P2_Biochemistry Lecturer

.....planning, a long term planning will put many of these behind us. We need to understudy how some other university that are doing it, how they really surmounted their own challenges. Because definitely they too also have challenges and if they still have challenges we need to think out of the box how we could put the challenges behind us. But sincerely it requires a lot of planning before it could be in operation.

.....FGD_P6_Anatomy lecturer

.....And then there should be a way the three departments will hold a meeting at the beginning of the session how do we want to go? Yes the curriculum is there but the departments must meet and then set the ball rolling. For example anatomy on Monday, taking the anatomy of a particular system, physiology say on Tuesday and biochemistry on Wednesday. It flows so that there will be no time loss.

.....FGD_P1_Physiology Lecturer

4.2.4.2 Category 2: *Appropriate curricular reviews*

Participants unanimously agreed that integration within the curriculum was the way forward to be at same level as other institutions and to meet the international standards of teaching and learning. More so, participants believed periodic reviews of the curriculum would go a long way to achieving good teaching and learning practices. Participants opined that authorities at the College, in collaboration with experts in curricular reviews, should review the curriculum to meet the requirements of the university and medical regulatory bodies in the country. They also stressed that curricular reviews are an intensive processes and not just a once-off two-hour meeting. Participants also argued that periodic curricular reviews would allow new concepts to be introduced to the curriculum. Some of the comments of the participants are shown below:

..... each department can submit a prototype whereby a committee will be set up at the College level with very, very senior people, you know and people who are well vast in the area at the top to now sit down and look at submission from the three departments and do the synchronization, so that will work better.

.....FGD_P1_Biochemistry Lecturer

we have talked about curriculum review and it looks like an endless thing I think it's important for each department to retreat and look at their curriculum and objectives and immediately following that let representative from each department be pulled together in a faculty for a whole college retreat, because you'll need a lot of time to be able to work through this and it's not something you do with a two hours meeting of a committee, so it will be important to lock ourselves up somewhere for 3 days and we'll know that all we want to do is to review our curriculum and do an objective assessment of the curriculum we've been running.

.....FGD_P2_Anatomy lecturer

4.2.4.3 Category 3: *Appointment of more teachers*

Considering the large group of students admitted into the medical school every session and the workload attached to the responsibility of teaching, it was noted during discussion that there was a need to employ more trained staff to aid teaching and improve performance. Since curricular integration also encourages small group learning and students' active involvement in class, appointing more personnel would go a long way in actualization this objective. Some excerpts of the discussions are shown below:

Then manpower is also needed as well, more personnel, more lecturers in the department and with that I think that is feasible and it is achievable. So also, I think the departments must be equally staffed, one. Two, the workload of lecturers have to be moderated because some of us still take course in other departments postgraduate program, PhD, MSc, supervision, we need to do that along with this. So the workload should be harmonized because you cannot get any younger, the longer you stay in the system the older you grow and the less the stress you should be subjected to.

..... FGD_P2_Physiology Lecturer

.....for us to be able to do proper integration system bearing in mind the number of programs that we run, staff strength need to be improved upon.

.....FGD_P6_Anatomy lecturers

4.2.4.4 Category 4: Incentives for teaching in the faculty.

One of the respondents believed that an enabling factor for integration within the curriculum and a means to get the best out of the teachers was to improve their welfare and incentives. The participant also opined that teaching and teaching-equivalent should be correctly scored for promotion of teachers so as to promote teaching. The quotation is highlighted below:

And again, there should be incentives, yes your regular salary is there but there is a way of making people happy so that when you say start this work 3rd week of August, that 3rd week will be 3rd week. I think the grading system for promotion again should be looked into, the kind of incentive to promote teaching...

.....FGD_P4_Physiology Lecturer

4.3 Summary

In Chapter four the findings of the FGD were presented. The participants demonstrated their understanding of what curricular integration meant as well as methods of curricular integration with which they were familiar. Participants believed integration was necessary to foster better understanding of the courses by the students and that it would also encourage interdisciplinary teaching. They also believed integration would remove curriculum overload. Timetabling was seen as an enabler to integration, while several logistic issues were perceived as barriers. Suggestions on the way forward

included aspects such as planning and better communication in the institutional. In chapter five these findings will be discussed in relation to the reviewed literature. After that a conclusion will be made.

CHAPTER 5: DISCUSSION

The findings of the focus group discussion (FGD) presented in chapter four are discussed in this chapter. The discussion is presented based on the themes that emerged on the interview findings. The chapter concludes with recommendations, limitation to the study and finally a conclusion.

5.1 Introduction

This study reveals the perspectives of the foundational teachers on integration within the curriculum at the CHS, OAU, Ile-Ife, Nigeria. The FGD findings show that the perspectives of teachers may influence the integration of the foundational sciences at the CHS. Four main themes that emerged during the interview are summarised in Table 5.1 below.

Table 5.1 Summary of themes.

Theme 1: Knowledge of integration

Theme 2: Perceptions of the need for and benefits of integration

Theme 3: Enablers and barriers of integration

Theme 4: Suggestions in order to implement curriculum integration.

5.2 Knowledge of integration within the curriculum

The knowledge of integration described the understanding of integration within the curriculum by the participants and the methods of integration with which the participants were aware. Participants demonstrated some understanding of what integration within the curriculum meant. They described integration as bringing together the content of the foundational courses to foster understanding and structuring the teaching and content in such a way that the same topic is taught by various departments from different perspectives. This is similar to the definition by Schwartz , Loten & Miller (1999). The understanding of integration within the curriculum by the participants varies as there are different definitions of integration in literature. Schwartz *et al.* (1999) described integration as integrating once separate courses or clinical experiences into a single unit, including combining basic sciences' courses. (Schwartz *et al.*, 1999: 677). However, the definition of integration within the curriculum goes beyond this. Shoemaker(1989) defined integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study” (Shoemaker, 1989: 2). Integration includes progressive development of concepts in which ideas are connected and related to real-life experiences (Brauer & Ferguson, 2015). Participants further described integration as “wholesome teaching in which interrelated

subjects are brought together and taught as a unit”. This definition is in tandem with the definitions of Harden (1984) and Atwa & Gouda, (2014). Harden (1984) defined integration as the organization of teaching material to interrelate or unify subjects that are often taught in separate academic courses (Harden *et al*, 1984:288) while Atwa & Gouda (2014) described integration as “intentionally bringing together knowledge, skills, values and attitude within and across courses to develop a more holistic understanding of the subject”(Atwa & Gouda, 2014). Integration ultimately refers to combining of courses that can be taught simultaneously and in context.

Participants were conversant with integration of foundational sciences (horizontal integration), but understood less of integration of basic and clinical sciences (vertical integration). None of the participants, however, mentioned or described spiral integration. A few participants described their experiences with integration within the curriculum in other institutions. This observation is not surprising as the participants did not have any formal training in medical education and were not aware of, or been exposed to integration methods in the course of their teaching career. These findings are consistent with McLean, Cilliers & Van Wyk, (2008) who observed that most teachers in medical schools did not have basic training in medical education. Faculty development in curricular integration and medical education approaches were, therefore, necessary for the teachers to understand curricular integration. The method of integration within the curriculum depends on the institution, the course or subject involved and the expected learning outcomes (Harden *et al.*, 1984). Three difference methods of integration are recognized, namely, horizontal, vertical and spiral (Hays, 2013; Brauer and Ferguson, 2015). .The methods of integration were discussed in section 2.4.1.

Some levels of curricular integration were mentioned during the study. These included synchronizing courses, making lectures concurrent with unified time table and having a single examination system. The participants were aware of isolation (lack of integration), awareness, harmonisation and temporal coordination (concurrent teaching) which are the first five steps on the lower rank of the Harden’s integration ladder (Harden, 2000) (see Figure 3 earlier in the document).

5.3 Perception of need for and benefits of integration within the curriculum

In this study, participants generally believed there is great need for curricular integration and they displayed positive attitudes towards integration. This finding is similar to the findings of van der Hoeven, van der Hoeven, Zhu, Busaidy & Quock (2018) who also found a positive attitude from Dental science teachers towards integration of basic medical sciences. However, some other authors from Iran

reported lack of positive attitudes by teachers of integration in basic sciences (Sum, Alinegad, Rastgar, Tashakkori, Khani & Pourghasem, 2013).

Benefits of integration alluded to in this study included that integration would foster better understanding of courses by students if the courses more interesting. This assertion is similar to the findings of Quintero *et al.* (2016) who reported that integration improves retention of knowledge and increases interest of learners in foundational sciences. Muller *et al.* (2008) collaborated on this in the report on lessons learnt in integrating a medical curriculum. They also indicated that students remarked that they are more motivated during integrated teaching. In that study students also found the teaching sessions very enjoyable, interesting and meaningful (Muller *et al.*, 2008). Furthermore, Worley *et al.* (2004) recognised that curricular integration improves students' motivation. In this study participants affirmed that integration of foundational sciences would convince students how different courses interrelate and connect to clinical practice. This submission is consistent with the submission of some authors that integration promotes retention and connection of ideas from basic to clinical practice (Dahle *et al.*, 2002; Brauer & Ferguson, 2008).

Participants believed that integration promotes interdisciplinary teaching where courses are synchronized around common themes and taught concurrently by the three departments. This finding is similar to the findings of Muller *et al.* (2008) that integration promotes interdisciplinary teaching and, thus, results in effective teaching. Interdisciplinary teaching is a step on the integration ladder and is on a higher rung (Harden, 2000). An important outcome of integration is to achieve interdisciplinary teaching when teaching and learning are organised around common themes and across disciplines (Worley, Esterman & Prideaux, 2004; Basu, Das & Chowdhury, 2015). Interdisciplinary teaching also encourages team-building amongst faculty members and could foster collaboration and interaction by teachers from different departments (Brauer & Ferguson, 2008; Malik & Malik 2011).

Further benefits expounded on by the participants were that curricular integration could reduce curricular overload and motivate students to attend classes. Integration could help reduce information overload to students by the selection relevant curriculum content across disciplines, while removing non-essential content (McLeod & Steinert, 2015). Curricular overload is an important challenge of the medical curriculum (McLeod & Steinert, 2015). Many authors supported the finding that the challenge of curricular overload in medical education could be ameliorated by integration within the curriculum (Hasan & Sequeira, 2012; Jones, *et al.*, 2001; Harden, 2000). Furthermore, the finding from this study suggested that integration could motivate students to attend classes when current lectures were based on

the knowledge acquired from previous lectures. This suggestion is consistent with the constructivism learning theory, since students learn by building knowledge on previous concepts. Construction of meaning through critical reflection by the students and integrating learning activities into knowledge and belief are components of the constructivist learning theory (Donald, 2002). Learners also tend to invest their time in what is meaningful to them and relevant to medical practice (Brauer & Ferguson, 2008).

5.4. Enablers and barriers of integration

In this study participants were able to identify timetabling as an enabling factor for integration. Presently, the CHS runs a 6-year medical programme: a one-year pre-medical programme, two-year pre-clinical and three years for clinical teaching and clerkship. Within the 2- year pre-clinical period the foundational sciences can be reorganised into an integrated curriculum model. The time schedule and time-tabling as currently exist encourage integration. Time can also be gained by integrating the courses effectively so that less important topics are removed from the curriculum. This suggestion is in agreement with the findings of Schwartz *et al.* (1999) from Otago University who reported that integration of foundational sciences allows reduction in students' contact time and reorganization of modules. Step four in the Harden's integration ladder described temporal coordination when the time-table was designed to align the same topic from different departments (Harden, 2000). This period could also be used to foster better integration of courses and collaboration among teachers (Muller *et al.*, 2008). In contrast, van der Hoeven, *et al.* (2018) suggested in their study that protected faculty time is required for better integration of the courses.

The challenge of inadequate space and facilities is not specific to integration within the curriculum, but a general challenge with which most health institution are faced. Burdick (2007) succinctly enumerated infrastructural deficit as a major challenge to health profession education in Africa. Apart from lecture space, other facilities, such as, projectors and internet facilities are lacking in the lecture rooms. Government and policy makers need to provide these facilities that will enhance students' learning environment.

Large groups of students coupled with inadequate facilities make student-teacher interactions very difficult. Large groups of students admitted to the institution were affected by the country's higher education admission policy that incorporated academic and non-academic criteria. Students from educational disadvantaged and underserved areas are also given special consideration for admission. Since it may be difficult for the institution to reduce the population of students, it is imperative that increased subsidies for health profession education, should be advocated (Burdick, 2007).

Another major barrier of integration recognized by the participants was inadequate staffing. The present, available staff are overworked. In most institutions the number of basic science teachers is extremely low compared to their clinical counterparts. For example, van der Hoeven *et al.* (2018) reported only 26 teachers in the foundational sciences, while over 200 clinical teachers were available in the dental institution. This situation was similar to the findings in this study. Some Zimbabwean authors also reported inadequate staffing in foundational sciences, especially in Anatomy and Physiology (Mufunda, Chatora, Ndambakuwa, Smakange, Sigola & Vengesa, 2007). When teachers were available even distribution of teachers amongst sub-speciality in the foundational sciences would be required to make integration of foundational sciences possible.

Participants believed that all teachers in both foundational and clinical sciences should see themselves as co-partners in the training of the medical students. This finding is similar to the finding of Dahle *et al.* (2002) that recognised the negative effect of inter-faculty and intra-faculty rivalry among departments and suggested that the contention should be minimised in the planning of integration. Muller *et al.* also documented difficulty in getting faculty buy-in especially among colleagues who do not normally communicate with each other.

Other authors also reported similar barriers in their context. Commitment by educational leaders to overcome these barriers, is crucial (Burdick, 2007).

5.5 Suggestions in order to implement curriculum integration

The possible ways by which integration could be implemented by the College of Health Sciences were enumerated by the teachers. These were institutional strategic planning, appropriate curriculum reviews, appointment of more teachers and incentives for teaching in the faculty.

For any programme to be successful long term planning is required, therefore the planning of an integrated curriculum should be done with reasonable time frames (Muller *et al.*, 2007). Dahle *et al.* (2002) emphasises the importance of curriculum planning in designing integrated curriculum in a PBL setting. Planning involves the teachers, students and institutional leaders who are drivers of the programme. Adopting the Kerns' six-step approach in curriculum development could assist during the planning stage of the integrated curriculum (Kern *et al.*, 1998).

Conducting regular and appropriate curricular reviews, is another suggestion mentioned by the participants. This suggestion is in line with Hopkins *et al.* (2015) recommendation that the perspectives of teachers and learning needs should be taken into consideration when planning structural changes

within the curriculum. Experts in the field of curriculum design are important to provide guidance and facilitate progress in the curriculum review process (McLeans *et al.*, 2008; Grant, 2014).

Appointment of more teachers and incentives for teaching in the faculty are other suggestions by the participants. Appointment of more teachers would reduce the workload of teachers and allow more time to participate in teaching and teaching-related activities. This notion is supported by Burdick (2007) who advocated increased establishment position for teachers especially in basic sciences. Incentives for teachers could motivate teachers to participate in the staff development programme that would be required to implement the curriculum (McLeans *et al.*, 2008). Teachers need to be encouraged to fully participate and implement the curriculum.

Starting an integrated curriculum would definitely require teachers to be trained in this 'new' concept and more commitment is needed from the teachers to teach and facilitate the process. Individual teacher expertise in handling integrated teaching is very important for the success of the programme. Most of the teachers presently do not have the requisite knowledge and skills to teach in an integrated curriculum.

5.6 Limitations of the study

Due to the nature of this small scale study, time for extended interviews was not possible. The focus group discussions were only conducted with the teachers that were available and consented to the study. It would have been worthwhile to also explore the perspectives of other teachers involved in teaching the foundational courses. Students are also important stakeholders in a curricular review process, therefore, exploring the perspectives of students in clinical clerkship who have already gone through the foundation courses would have increased the richness of data. There was, however, no time for students' interviews during this small scale study. An in-depth interview with some selected teachers would also have enhanced the richness of the data.

5.7 Contribution of the study

The findings from the research could be useful to my institution and the curriculum committee during the curriculum review process. The findings can potentially contribute to the body of knowledge in health professions education regarding perspectives of foundational sciences teachers on integration within the curriculum in a similar context. Further research in the institution to explore the perspectives of students and other stakeholders about the factors that may contribute to an effective curriculum integration, could be very useful.

5.8 Recommendations

There is a dire need for staff development in the Faculty. Teachers need to be trained and become life-long learners. With numerous innovations in medical education, the College cannot continue to lag behind. Institutional strategic planning with adequate funding is needed to reposition the College as a 21st century medical school. In the meantime, the leadership of the College need to engage all teachers in the decision-making process to increase collaboration and communication amongst teachers. Heavily loaded subjects in the foundational sciences could be converted to unit courses to reduce course overload and enhance curricular integration.

5.9 Conclusion

In conclusion, this study revealed that, foundational science teachers support the integration of curriculum in the college in order to enhance better lecturing practices and aid students' participation and understanding of the courses, being taught. Therefore, it seems justified that there is a need for curricular integration of foundation science courses to improve the quality of the training of graduates at the college.

Overall, respondents opined the significant importance of curricular integration and suggested that this was the way to move forward in order to get the best out of both teachers and students.

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Addendum A (Focus group interview prompts/guide)

Based on the objectives, the following questions will be asked

I would like to begin with a very general question.

1. When you hear or use the word integration within the curriculum what does it mean to you?
2. .What are the different methods of integration you are aware of know?
3. Do you think there is need for integration of the foundational sciences?
4. What are the perceived barriers and enablers we are likely to encounter with integration?
5. What are the possible ways in which integration can be implemented?
6. What are your opinions about integrating the foundational sciences?

Addendum B: Reflective Journal

JULY 26 2018

As I prepared for the focus group discussion my apprehension was first to acknowledge the fact that I play an active part in the quest for curriculum review in College. My role, perceptions and understanding may affect the participants responses. The lesson learnt was to allow the participants do more of the talking while I listen without showing any facial or non-verbal cues.

The participants became more relaxed after re-assuring again that is for research purpose.

30 July 2018

During the course of the interview I realised that there is an unspoken fear among the teachers of losing the grip on their discipline. The thought that came to my heart is the question 'Why are you bordering about integration? Let us continue the way we are. We have enough workload already.

Thought during transcription process.

There was disconnect between the leadership of the College and the teachers. There is little or no effort by the leadership to improve the teaching and learning process in the College.

Thoughts during final processes of generating results:

My initial hypothesis to answer the research question was far removed from the data received. Some of the participant demonstrated understanding of what integration means while the concept of integration is completely new to some. Other has never being part of or seen it used and wonder how that could be feasible with their current workload. There is a great need of faculty development in the Faculty. Bearing in the usual lack of fund slogan, there is something little I start with. I also thought the participants were more forthcoming with barriers to integration than enablers.

Addendum C: Ethical approval letter:

SU HREC Ethical approval

Approved with Stipulations

New Application

25/06/2018

Project ID: 6622

HREC Reference #: S18/03/066

Title: STEPPING ON THE LADDER OF INTEGRATION: THE PERSPECTIVES OF
FOUNDATIONAL SCIENCE TEACHERS ON DISCIPLINE- BASED CURRICULUM

Dear Dr GANIAT Omoniyi-Esan

The Response to Modifications received on 10/06/2018 13:53 was reviewed by members of the Health Research Ethics Committee via Minimal Risk Review procedures on 25/06/2018 and was approved with stipulations.

Please note the following information about your approved research protocol:

Protocol Approval Period: 25-Jun-2018 to 24-Jun-2019.

The stipulations of your ethics approval are as follows:

Kindly review and correct your reference list.

Please remember to use your project ID 6622 and ethics reference number on any documents or correspondence with the HREC/UREC concerning your research protocol.

Translation of the consent document(s) to the language(s) applicable to your study participants should now be submitted to the HREC.

Please note that this decision will be ratified at the next HREC full committee meeting. HREC reserves the right to suspend approval and to request changes or clarifications from applicants. The coordinator will notify the applicant (and if applicable, the supervisor) of the changes or suspension within 1 day of

receiving the notice of suspension from HREC. HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:

Please note you can submit your progress report through the online ethics application process, available at: <https://apply.ethics.sun.ac.za> and the application should be submitted to the Committee before the year has expired. Please see Forms and Instructions on our HREC website for guidance on how to submit a progress report.

The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility, permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Please consult the Western Cape Government website for access to the online Health Research Approval Process, see: <https://www.westerncape.gov.za/general-publication/health-researchapproval-process>. Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and instructions, please visit: Forms and Instructions on our HREC website (www.sun.ac.za/healthresearchethics)

If you have any questions or need further assistance, please contact the HREC office at 021 938 9677.

Addendum D: OAU/IPH APPROVAL



HEALTH RESEARCH ETHIC COMMITTEE (HREC)
INSTITUTE OF PUBLIC HEALTH
OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA.



Our Ref: HREC NO: IPHOAU/12/1036

Date: July 16th, 2018

Your Ref: _____

Notice of Full Approval after Full Committee Review

**STEPPING ON THE LADDER OF INTEGRATION: THE PERSPECTIVES OF
FOUNDATIONAL SCIENCE TEACHERS ON DISCIPLINE-BASED
CURRICULUM.**

Health Research Ethics Committee assigned number: IPHOAU/12/1036

Applicant's Name: OMONIYI-ESAN Ganiat Olutoyin.

Applicant's Address: Dept. of Morbid Anatomy & Forensic Medicine, OAU, Ile-Ife.

Date of receipt of valid application: May 2nd, 2018

Date of meeting when final determination of research was made: 15th July, 2018

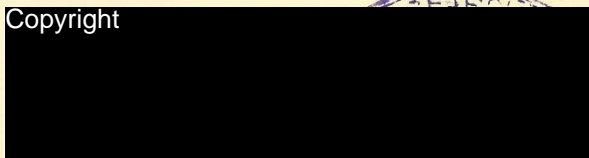
This is to inform you that the research described in the submitted protocol (HREC No: IPHOAU/12/1036), the consent forms and other participant information materials have been reviewed and *given full approval by the Health Research Ethics Committee.*

This approval dates from July 15th, 2018 to July 14th, 2019. If there is delay in starting the research, please inform the HREC so that the dates of approval can be adjusted accordingly.

Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study.* In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit to your research site without previous notification.

Copyright



Web-site: www.iphoau.org // E-mail: iph@oauife.edu.ng, iphhoauife@gmail.com

Addendum E: Participant Information leaflet and Consent form

TITLE OF THE RESEARCH PROJECT:

STEPPING ON THE LADDER OF INTEGRATION: THE PERSPECTIVES OF FOUNDATIONAL SCIENCE TEACHERS ON DISCIPLINE- BASED CURRICULUM

REFERENCE NUMBER: HREC Reference #: S18/03/066

Institutional Reference: Ref IPH/OAU/12/1036

PRINCIPAL INVESTIGATOR: OMONIYI-ESAN GANIAT OLUTOYIN

ADDRESS:

CENTRE FOR HEALTH PROFESSION EDUCATION, FACULTY OF MEDICINE AND HEALTH SCIENCES, SU. / DEPT. OF MORBID ANATOMY AND FORENSIC MEDICINE OBAFEMI AWOLOWO UNIVERSITY ILE-IFE ,NIGERIA.

CONTACT NUMBER: Copyright

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

The study will be conducted at the College of Health Science Obafemi Awolowo University (CHS, OAU) Ile-Ife, Nigeria. The study population will include all the teachers in the departments of anatomy, physiology and biochemistry at the CHS, OAU, Ile-Ife. Presently, there are 26 academic staff members in the basic science departments, 11 in anatomy, 8 in physiology, and 7 in biochemistry.

This research is being conducted to explore the perspectives of foundational science teachers on integration of foundational science courses, that is, anatomy, physiology and biochemistry.

The CHS, OAU desire curriculum renewal and integration within the curriculum. Integrating course without active involvement of the teachers will not bring the desired outcome. So, it is important that the perspectives of teachers involved in teaching these courses are known, hence this study.

Three focus group discussions will be conducted. One focus group discussion will be conducted in each of the departments. The whole population of staff in each of the departments will be invited for the respective focus group discussion. The discussions will be conducted in the staff common room where all staff members interact freely with each other and are comfortable. The responses of the participants will be audio-recorded and analyzed.

Why have you been invited to participate?

All academic staff in the departments of anatomy, physiology and biochemistry at the CHS, OAU, Ile-Ife are invited for this study. This is to ensure that every staff has opportunity to express their perspectives about integration within the curriculum.

What will your responsibilities be?

If you agree to participate in the study you will be asked to be part of a focus group discussion in your department that will last for one hour.

Will you benefit from taking part in this research?

There may not be any personal benefit. The findings from the research could be useful to the CHS, OAU and the curriculum committee during the intended curriculum review process.

Are there risks involved in your taking part in this research?

There are no personal risks for any staff that participate in the study.

If you do not agree to take part, what alternatives do you have?

Participation in the study is entirely voluntary and you are free to opt out of the focus group discussion when you wish to.

Who will have access to your medical records?

Medical records will not be accessed for the study.

What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

Not applicable

Will you be paid to take part in this study and are there any costs involved?

No. You will not be paid to take part in the study but your transport and meal costs will be covered for each study visit. There will be no costs involved for you, if you do take part.

Is there anything else that you should know or do?

You can contact Dr Omoniyi-Esan G.Olutoyin at tel Copyright

- if you have any further queries or encounter any problems.
- You can contact the Stellenbosch University Health Research Ethics Committee at 021-938 9207 email Copyright if you have any concerns or complaints that have not been adequately addressed by your study doctor.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled Stepping on the ladder of integration: The perspectives of foundational science teachers on discipline- based curriculum

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 2018.

.....

Signature of participant

.....

Signature of witness

Declaration by investigator

I (*name*) declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*)

Signed at (*place*) on (*date*) 2018.

.....

Signature of investigator

.....

Signature of witness

Declaration by interpreter

I (*name*) declare that:

- I assisted the investigator (*name*) to explain the information in this document to (*name of participant*) using the language medium of Afrikaans/Xhosa.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) on (*date*)

.....

Signature of interpreter

.....

Signature of witness