

**A MODEL FOR INTEGRATING INTERPROFESSIONAL
EDUCATION IN THE TRAINING OF HEALTH
PROFESSIONALS AT JOMO KENYATTA UNIVERSITY
OF AGRICULTURE AND TECHNOLOGY**

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**A model for Integrating Interprofessional Education in the Training of
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Technology**

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as university supervisors

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DEDICATION

This work is dedicated to my late dad. An educationist per excellence. For believing in me and thinking I was a very bright girl. Dr Kithuci is the name I adopt in your honour dad.

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
CAIPE	Centre for Advancement of Interprofessional Education
CA- IPERA	California Interprofessional Education Research Agency
CIHC	Canadian Interprofessional Health Collaborative
COBES	Community Based Education and Service
COHES	College of Health Sciences
ELT	Experiential Learning Theory
ERC	Ethical Research Committee
FGD	Focused Group Discussion
HEPI	Professional Education Partnership Initiative
HIC	High Income Countries
InterEd	Interprofessional Education and Collaborative Practice
IPE	Interprofessional Education
IPEC	Interprofessional Education Collaborative
IPHCT	Interprofessional Health Care Teams
KII	Key Informant Interview
LMIC	Lower- and Middle-income Countries
PBL	Problem Based Learning
RIPLS	Readiness for Interprofessional Learning Scale
SIM-IPE	Simulation Interprofessional Education

SoMED	School of Medicine
SON	School of Nursing
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Bio demographics will refer to the faculty's age, gender, profession, years of experience as health worker and as health educator, School, academic position and expertise level.

Collaborative practice is when multiple health workers from different professions work together around client's health care delivery

Community based education and service (COBES) learning activities that use the community as a learning environment where students, faculty and community stake holders are involved in learning.

Educational administrators Deans and Principal in the College of Health Sciences. In this study this will be limited to Deans in the Schools of Pharmacy, Biomedical Sciences, Nursing, Medicine and Public health and the College Principal.

Faculty Academic members of staff of all cadres in the five schools at the college of health sciences, JKUAT

Interprofessional collaboration active and ongoing partnership between two or more professions who work together to solve problems or provide solutions.

Interprofessional education IPE is an experience that occurs when students from two or more professions learn about, from and with each other. This leads to effective collaboration and improve health outcomes.

Interdisciplinary learning This happens when students from one health profession are taught by faculty from another profession. Also referred to as shared learning.

Interprofessional Teamwork The levels of cooperation, coordination and collaboration characterizing the relationships between professions in delivering patient-centered care.

Multiprofessional Learning learning between more than two or more professions in parallel with interaction.

Research Package- In this study, this refers to research methods, epidemiology and statistics courses that are in the curricula of all the health professionals at the College of Health Sciences, JKUAT

Uniprofessional Learning Learning occurring among students of the same profession

Perceived Perceptions This is used to mean perceived Barriers and Perceived hinderances to IPE in this study. It will also include the strategies that would help overcome the challenges.

ABSTRACT

The quality of healthcare in a health care system is dependent on many factors among them the type of health professionals trained and released to the job market. Training health professionals in a way that ensures teamwork, collaborative practice towards improving quality of care is important. Interprofessional Education (IPE) is one such approach to training. The main aim of the study was to develop a model of integrating IPE into the training of health professionals at the College of Health Sciences, JKUAT main campus. Explanatory sequential mixed study design was adopted to collect data among 71 respondents from the five schools at the College of Health Sciences for Phase I while phase II involved 3FGDs among faculty, 4 FGDs among students and 6 KIIs who included college principal and deans of schools. In phase 3, a model for integrating IPE into curricula was developed and validated by a panel of 7 experts drawn from diverse health backgrounds. A Questionnaire, attitude scales, FGD and KII guides aided in data collection. Quantitative data was analyzed using SPSS Version 25.0 software for descriptive statistics at 95% confidence level. Knowledge and attitude were measured using modified Blooms cut off. The qualitative data was transcribed then analyzed using NVIVO version 12 software, grouped to form themes and presented as narratives and verbatim excerpts. There were more males than females, almost half of the respondents held the Lecturer position, and the mean age of the respondents was 42 years. There was good knowledge on IPE among respondents with a score of $9.62 \pm 0.12 > 80\%$. When asked to define IPE using an open-ended question, 42 (59%) defined it as shared learning. More than half of the respondents 42(59.2%) were novices on IPE. There was no statistically significant relationship between faculty's characteristics and their knowledge on IPE. The overall attitude score was positive ($118.11 < 75\%$), Subscale 1 and 2 yielded positive attitudes with subscale 3 on attitudes of faculty towards IPE in academic settings subscale yielding negative attitudes ($36.86 < 75\%$). Bio-demographic characteristics were not significant in influencing faculty's attitude. Faculty who said they would support IPE initiatives were 2.3 times more likely to have positive attitudes compared to those who said wouldn't support. There was no relationship between knowledge and attitude ($P=0.125$). This study concludes faculty had good knowledge on IPE by score, they had overall positive attitudes towards IPE though attitudes in academic settings were negative, the benefits of IPE included teamwork, improved interpersonal relationships, better communications, and better use of resources. Curricula related challenges, (rigidity, regulatory body demands, timelines and schedules, the unit system), Professional related challenges (Attitudes, stereotypes, inferiority, and superiority complexes), limited resources (human and physical infrastructure) were some hinderances that needed to be overcome to enable IPE adoption. IPE initiatives should be initiated early and followed through in training, should be evaluated to measure effectiveness, delivered using a blended approach and embedded in curricula for sustainability. Shared learning for areas with similar content and depth should be implemented as an entry point to IPE across schools. An introductory IPE course early in training was suggested to equip learners with IPE core competences that would then aid facilitating applied courses like research package,

communication skills, nursing skills and community health using IPE approach. COBES attachment in their senior years where they can do joint research projects is suggested too. The content areas, modalities and strategies for IPE adoption have been incorporated in a model that is prescriptive summarizing what the research conclude would aid curricula integration. This study recommends sensitization training, intentional IPE agenda at the College level meetings, appointing IPE champions and curricula synchrony to enable IPE integration into curricula.

CHAPTER ONE

INTRODUCTION

1.1 Background information

Health care workforce is one of the six building blocks of health care systems. This block needs strengthening if achieving universal equitable access to quality healthcare is to be achieved. Producing health care professionals alone isn't enough, but producing those professionals with the right competencies to respond to the ever evolving needs of the populace is key (WHO, 2013). How these professionals are trained therefore cannot be ignored as it will determine the kind of health workforce released for practice.

Traditionally professionals were trained through apprenticeship from peers and training was hospital based. They trained in their own schools by members of the same profession. Individuals formed their own professional identity and knew very little about what other professions did (Reeves et al., 2010). This form of training was ideal in the era of primary care practice as they could form effective primary care teams. Over time in the 1950s, in the United State of America (USA), Interdisciplinary education started being practiced. Interdisciplinary education happens when students from one health profession are taught by faculty from another profession. In the USA, most universities have core courses for interdisciplinary education (Carr, 2015). The first Institute of Medicine (IOM) conference in 1972 report discussed the importance of establishing substantive relationships between educational programs for the health professions (Barr, 2015). This report supported the concept of interdisciplinary education for health science students. Interdisciplinary education has since been widely adopted in training of health professionals to cut on cost, staff rationalization and avoiding duplication of work in situations where there is common curriculum content (Barr, 2015).

Over the past century, the demographic, epidemiology, socioeconomic and technological environment has changed drastically. This has posed increased demands on health care

professionals (WHO, 2013). The curriculum implementation period has remained constant over the decades despite exponential growth in medical information. While it may not be possible to change curricula with every change in the health system, delivering the curricula in a manner that embraces these complexities would be helpful. This has therefore called for innovative ways of curriculum implementation. Interprofessional education (IPE) is one such innovation. IPE is an experience that occurs when students from two or more professions learn about, from and with each other to enable effective collaboration subsequently improving health outcomes (CAIPE, 2012; IPEC, 2011; WHO, 2010). IPE has been seen to have a positive effect in that when learners engage in IPE they learn about each other's scopes of responsibility, they can identify strengths in other team members that may complement or enrich their own practice and they're more likely to ask for help or speak up to help someone within teams. Further, they develop more effective problem-solving, their communication skills improve, their patient care is safer and more personalized as a result of sharing vital information and they enjoy their work more (Disch, 2017). Interprofessional Education too involves socializing health care providers in working together in shared problem solving skills and decision making, developing mutual understanding and respect for the contributions of various disciplines and instilling the requisite competencies for collaborative practice. (Barr, 2015). IPE foster collaborative practice among health care workers and subsequently teamwork at the workplace. Collaborative practice happens when multiple health workers from different professional backgrounds work together with patients, families and communities to deliver the highest quality of care (WHO, 2010).

There has been continued increase in global concerns regarding the delivery of health care and the role of Interprofessional teams in reducing safety errors and improving health care quality. The UK and Canada have taken leadership roles and were the first to initiate and implement IPE (Rodgers & Hoffman, 2010). In 1978, the WHO identified IPE as a key component of primary health care. This global organization's initiative built upon the considerable progress that had been achieved in the area of IPE (WHO,

2010). Institute of Medicine (IOM) 2010 too recommended the integration of IPE in curriculum. In 1982, Center for advancement of Interprofessional Education (CAIPE) was launched in the UK and later in 1986 Journal of Interprofessional care was launched. In the 1990s Canadian Interprofessional Health Collaborative (CIHC) was realized (Canadian Interprofessional Health Collaborative, 2009). Additionally, The World Health Organization forum on Interprofessional education and collaborative practice was launched in May 2007 to help member states strengthen their health workforce challenge. The WHO Health Professions Networks Team in collaboration with Interprofessional Education and Collaborative Practice (InterEd), formed a WHO study Group on Interprofessional Education and Collaborative practice drawn from 40 countries. It is from this study group that it emerged evidence of how various countries conducted IPE. Most of these were from developed nations. Later in 2010, WHO in its report, published the framework for Action on Interprofessional education and collaborative practice. In the USA, (Rodgers & Hoffman, 2010). The National Centre for Interprofessional Education was founded in October 2012. In 2013, WHO developed guidelines to help in transforming and scaling up health professional's education and training, with IPE as one of the thematic areas (WHO, 2013)

A systematic review on IPE conducted by Sunguya et al., (2014) revealed that it is occurring in several countries mostly high income countries (HIC) like USA, Australia, Canada, Sweden, UK, Norway, Poland, Belgium, Malaysia. It is also happening in some low and middle income countries (LMIC) like Ghana, Egypt, South Africa, Ethiopia, Algeria, Uganda and Namibia though there is limited literature on the same (A. Amalba et al., 2016); Chang et al., 2011; Sunguya et al., 2014).

In Kenya, institutions of higher learning have combined students from different professions in class to teach common units with similar content in their curriculum. This is referred to as interdisciplinary/Multiprofessional/shared learning and not IPE as it has been sometimes misunderstood. Despite availability of little literature, evidence has shown implementation has taken place at Moi University students from medicine, nursing, dentistry, physical therapy and medical psychology at the college of health

sciences engage in a form of community based IPE dubbed Community Based Education and Service(COBES) (Mining, 2017). Another evidence of IPE in Kenya has been seen in implementation of the Health Professional Education Partnership Initiative (HEPI) grant in collaboration with University of Nairobi (UON), JKUAT, Maseno university and Kenyatta University (KU) that engage students from the collaborating universities in research. Another grant under the same collaborating universities is the Strengthening Interprofessional Education for Human Immuno-deficiency Virus management (SRIPE-HIV) to train final year students about to graduate on HIV management.

1.2 Statement of the problem

Tremendous growth in health specialists addressing treatments and prevention of disease has been recorded. Coupled with these are shifts in societal demographics and technology transformation in health and educational systems. These changes are causing many educators and health professionals around the world to call for new models for educating health professionals that better reflects the diseases of the populace they will serve (Rodgers & Hoffman, S, 2010). One of such models is integrating Interprofessional education (IPE) in health professionals training curricula. IPE is an important pedagogical approach for preparing health professionals to provide care to patients in a collaborative team environment.

Health service users require professionals with different skills to be able to provide a wide range of health care services provided in a seamless manner. This calls for collaboration among health care providers to foster teamwork (Baldwin, 2010). Achieving this teamwork hasn't been easy as team members see themselves as representatives of their profession rather than as members of a collaborative team. This in turn brings rivalry between professional groups especially regarding who becomes the lead clinician or who gets the credit. Rivalry is also occasioned by limited resources. There has also been conflict on social identity where professionals within a team may ask who they are and have in common with other team players. When they don't achieve

a positive social identity then there occurs a barrier in collaboration (National Advisory Council on Nurse Education and Practice (NACNEP), 2015).

A Cochrane review identified six studies evaluating effectiveness of IPE compared to traditional education approaches on patient outcomes. Four of the six studies showed positive patient outcomes, better teamwork, less error rates and increased satisfaction among professionals (Reeves et al., 2010). Collaborative practice improved patient outcomes, lowered mortality rates and reduced length of hospital stay while lack of teamwork and collaboration among professionals leads to stress and conflicts at the work place, job dissatisfaction, inefficiencies in the delivery of care and subsequently affect the quality of care offered (Rose, 2011). Incorporating IPE in the training of health professionals is one way that can foster teamwork among health professionals and subsequently enhance collaborative practice later during their practice.

Despite IPE being advocated for by WHO, IOM and other partners as a better way of training health workers it hasn't been widely adopted. While some health profession schools are making these changes to teach in teams, it is not happening fast enough on a broad scale. Uniprofessional training is still happening in many countries and health sciences colleges. Various global reviews done have acknowledged that nations are at different levels of IPE implementation (Barr, 2015; Rodgers & Hoffman, 2010). There is more practice in HIC nations with little evidence of its existence in developing countries and more so in Kenya. By incorporating IPE in training the spill-over effect would be teamwork and collaborative practice at the workplace. JKUAT lacks a structured IPE implementation framework. This study therefore seeks to assess the situation of IPE at JKUAT and develop a model that can be proposed for adoption in integration of IPE into the existing curricula at the college of health sciences.

1.3 Justification of the study

World Health Organization and partners acknowledge there is sufficient evidence to show effective IPE enables collaborative practice, helps in optimizing health services,

strengthening health systems, and improving health outcomes. The organization endorsed IPE considering its effectiveness and calls for nations to adopt IPE and integrate it in the existing curricula to yield its desired effects (WHO, 2010). It is envisaged that by integrating IPE in the curriculum, it will ensure sustainability and cost effectiveness which can ensure its adoption even in resource constrained countries like Kenya.

There exist areas of overlap in the training of health professionals that can foster task sharing and shifting. Considering the wide health human resource gaps in our set ups, IPE has been seen as an innovation that would train health professional for purposes of bridging these gaps.

IPE Education provides students with opportunities to learn and practice skills that improve their ability to communicate and collaborate. Through the experience of learning with and from those in other professions, they also develop leadership skills and respect for each other which prepares them to work in teams and in settings where collaboration is a key to success. Further, IPE helps in the achievement of SDGs 3 on good health and wellbeing and SDG 4 on good education.

Faculty are key partners in IPE as they implement it and offer support to students. This study sought to identify knowledge and attitudes on IPE among faculty at Jomo Kenyatta University of Agriculture and Technology (JKUAT) College of Health Sciences (COHES) and develop a model that can be adopted in the integration of IPE in the training curricula. The information generated informed the status of IPE in JKUAT and more so widen the body on knowledge on IPE in Kenya as there's is little documented literature. JKUAT was chosen as its one of the institutions of higher learning training a wide mix of health professionals. It is also a relatively new health professional college therefore it would benefit more from the model if adopted into curricula and subsequent training.

1.4 Research questions

1. What is the faculty's knowledge on IPE at the COHES, JKUAT?
2. What are the faculty's attitudes towards IPE at the COHES, JKUAT?
3. What are the faculty's and students' perceptions towards IPE at the COHES, JKUAT?
4. What would be the preferred content areas for IPE at COHES, JKUAT?
5. What are the preferred modalities for integrating IPE in training of health professionals at COHES JKUAT?

1.5 Objectives

1.5.1 Broad objective

To develop a model for integrating Interprofessional Education in the training of health professionals at the college of health sciences, JKUAT

1.5.2 Specific objectives

1. To determine faculty's knowledge of Interprofessional education at COHES, JKUAT
2. To measure attitudes of faculty and associated factors on Interprofessional Education at COHES, JKUAT
3. To explore the faculty's and students' perceptions towards Interprofessional education at the COHES, JKUAT?
4. To explore preferred content areas for Interprofessional education among faculty at COHES, JKUAT.
5. To explore preferred modalities for integrating IPE in the training of health professionals among faculty at 66COHES, JKUAT

1.6 Study hypothesis

H0: There is no relationship between faculty's knowledge and their attitudes towards IPE at COHES, JKUAT.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides the literature review, conceptual and theoretical framework of the study. The researcher used Medscape, PubMed, Medline, and Google Scholar as the search engines. Interprofessional learning and Interprofessional education was used interchangeably in this study. Faculty, academicians, teachers, and lecturers were used synonymously in reviewing knowledge and attitudes of faculty.

2.2 History of health professionals education

In middle-ages, doctors and nurses learnt through apprenticeship from peers as there was no formal curriculum. Students did oral examination set by their peers to judge knowledge and skills acquisition(Scheckel, 2009). Health professional training was hospital based. In 1910, Abraham Flexner, criticized the splintering of education for health care professionals (WHO, 2013) Consequently, the Flexner commission 1910 recommended training of health professionals in hospitals with more emphasis on science and little on social and community approach(WHO, 2013). Professionals learnt singly and were taught by their own, often called uniprofessional learning.

During the World War II, interdisciplinary teams were utilized in surgery, burns, rehabilitation, and long-term care (Baldwin, 2007). In the 1970s, the first systematic review of studies regarding the impact of team delivery of care was done (Rodgers & Hoffman, 2010). This systematic review led to the recognition of IPE as a field of study. Since then, there has been exponential growth in IPE.

2.3 Understanding interprofessional education

The World Health Organization first identified Interprofessional education as an important component of primary health care in 1978. It later issued its technical report on this subject in 1988 (WHO, 1988) as cited in (Regmi & Regmi, 2016). Around the same time the World Federation of Medical Education acknowledged Interprofessional Education in 1988.

Interprofessional Education is a learning situation in which two or more professional groups learn from, with and about each other with an aim of improving collaboration or integration of their specialist knowledge to help synthesize solutions to improve the quality of care (CAIPE, 2012). An IPE experience can happen among faculty and students when two or more professions engage. Where Interprofessional education exist among students; collaborative practice will be easier in their practice. Collaborative practice (CP) is defined as planned purposeful and concerted action within and between professions, within and between organizations, with service care givers and communities to improve care services and safety (CAIPE, 2012). Related to IPE and CP is continuing Interprofessional education (CIPE) defined as education undertaken after initial qualification when members of two or more health care professions learn with, from and about each other to improve collaboration and quality of care.

IPE is seen by some as a cost-effective way of training competent health care students and practitioners mostly in the LMIC, where the number of health professionals is relatively low. More importantly, IPE is a way of fostering collaborative practice and seamless integrated patient care later in practice (Yan & Gilbert, 2008).

Interprofessional education can help breakdown stereotypical views, improve relationships with other disciplines, increase trust, deepen understanding of other professions' roles and responsibilities, and assist in developing the communication and interpersonal skills necessary for productive interprofessional teamwork (Regmi & Regmi, 2016). Interprofessional Education ensures that professionals in the health care

team understand each other's roles, competences, basic language, and mindsets and that they develop attitudes and behaviors that facilitate collaboration. Further IPE increases confidence in health professionals' identity and appreciation of the roles of the other professions, improving communication and team working skills (WHO, 2013b). When individuals of different professions learn together, the experience break down the professional wall between them, it helps change their attitudes and reduce stereotypes between professions within the medical field (Sunguya et al., 2014)

2.4 Evolving Trends in Interprofessional Education

Interprofessional Education continues to be supported by national organizations as an essential component of the education of healthcare professionals. According to the National Center for Interprofessional Education and Practice, the history of exploration of the need for health care providers to collaborate to impact practice began over 50 years ago(CAIPE, 2012).

Global concerns regarding the delivery of health care and the role of Interprofessional teams in reducing medical errors have raised over the years. The UK and Canada assumed leadership roles in IPE (Rodgers & Hoffman, 2010).

The first Institute of Medicine (IOM) conference in 1972 produced a report that discussed the importance of establishing substantive relationships between educational programs for the health professions (Baldwin, 2007). This report supported the concept of interdisciplinary education for health science students and argued an educational experience can be interdisciplinary at the level of the student, faculty, or both.

In 1978, the WHO identified IPE as a key component of primary health care built upon the considerable progress that had been achieved around IPE. In 1987, the Center for the Advancement of Interprofessional Education (CAIPE) came to being in the UK while the Journal of Interprofessional Care had been launched a year back in 1986. This

peer-reviewed journal continues to reinforce collaboration in education, practice, and research for health and social care(Baldwin, 2007).

In 2002, IOM Summit made the case for reforming Health Profession Education to improve safety and quality of health care (IOM, 2015). This was endorsed in the report, the IOM Health Professions Education: A Bridge to Quality (2003) that recommended IPE as a strategy to improve communication, collaboration, and problem solving among health care teams. The report also recognized the importance of patient safety and outcomes addressing healthcare providers' collaboration and communication. The IOM (2003) vision encompassed the view that health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team through evidence-based practice, quality improvement approaches, and informatics. The need for health professionals to develop competencies and integrate Interprofessional practice into educational programs gained momentum with the support of the IOM (IOM , 2015).

The Canadian Interprofessional Health Collaborative (CIHC) was established in 2006 to promote IPE, foster collaboration in healthcare practice, and patient-centered care. Their goals include sharing knowledge with policy makers, planners in the health and education systems, health professionals, and educators to ensure that all Canadian citizens benefit from healthcare practice and patient-centered care. CIHC organization also assists health providers, teams, and organizations with the resources and tools needed to apply an Interprofessional, patient-centered, and collaborative approach to healthcare(Canadian Interprofessional Health Collaborative, 2009)

In 2006, The WHO Study Group on Interprofessional Education and Collaborative Practice was developed comprising of top education, practice and policy experts from across every region of the world(Yan & Gilbert, 2008). In 2009, a collaborative group Interprofessional Education Collaborative (IPEC) was formed. The Interprofessional Education Collaborative focus was to promote and encourage Interprofessional learning experiences to prepare future health professionals for enhanced team-based care of patients and improved health outcomes (Schmitt et al., 2011).

To highlight the global status of IPE, the WHO, Framework for Action on Interprofessional Education and Collaborative Practice (InterEd) report was published in 2010. Further, IOM recommended integration of Interprofessional practice in educational curricula in the report: *The Future of Nursing, Leading Change, Advancing Health* (IOM, 2010). This report called for the Interprofessional team training to begin early in the training of health professionals. It was agreed that the components of IPE should include knowledge of professional roles and responsibilities, effective communication, conflict resolution, and shared decision-making among professionals. Further, for students to engage in future collaboration, they should be exposed to working with other health professional students using simulation as well as web-based training (IOM, 2010).

In 2010, CIHC developed six competency domains for IPE namely: Role clarification, Team clarification, Interprofessional communication, Patient/client/family/community centered care, Interprofessional conflict resolution and collaborative leadership. Related to these, in 2011 the Interprofessional Education Collaborative (IPEC) released principle Core Competencies for Interprofessional Collaborative Practice. There are four domains (Values/Ethics for Interprofessional Practice, Interprofessional Communication, Roles/Responsibilities, and Teams and Teamwork) with 38 core competencies to provide integrated, high-quality care to patients within the current, evolving health care system. These principles and core competencies help to strengthen IPE curricula development at all health professional schools (CAIPE, 2012).

In 2013, WHO developed guidelines to help in transforming and scaling up health professionals' education and training. Interprofessional education was recognized as one of the thematic areas. Further to this, WHO formed Eastern and African Countries Interprofessional Education and Practice Networking (ECIPEN) comprising members from the East and Africa as a forum for promoting IPE in developing countries (WHO, 2013b).

In Africa, the Africa Interprofessional Education Network (AfrIPEN) was launched in 2015 and the Second Interprofessional Education and Collaborative Practice for Africa conference took place at the AMREF International University, Nairobi, Kenya from July 30 to August 2, 2019.

There continues to be exponential growth in IPE. This is evidenced by adoption of IPE by bodies like WHO and IOM, increase in IPE publications, increasing countries IPE organizations, Universities IPE centers, some professionals adopting IPE in licensure and even increase in the number of institutions adapting IPE. Despite this uniprofessional training still exists and many countries haven't embraced IPE yet (Sunguya et al., 2014).

2.5 IPE competencies for Interprofessional Education

When students from different professions engage in IPE, there are certain competencies that cut across all the engaging professions that can be incorporated in IPE curricula. These competencies do not replace the core curricula of these professions but rather can be used as a guide when making the IPE materials for learners. Different models of IPE have been brought forward and even debated on which is the best for training health professions. The choice of the model to use is based on the institutions culture, the resources, time and even the expertise of faculty on IPE. However, whichever model is chosen, one common unifying factor is that they all try to incorporate the four key competency domains of IPE.

2.5.1 Domain one: Values and Ethics for Interprofessional development

Values and Ethics are an element of professionalism which has significant overlap with constructs of humanism and morality (Schmitt et al., 2011). They help develop mutual trust among professionals.

The specific values include.

- i. Place the interests of patients and populations at the center of Interprofessional health care delivery.
- ii. Respect the dignity and privacy of patients and maintaining confidentiality in the delivery of team-based care.
- iii. Embrace the cultural diversity and individual differences that characterize patients, populations, and the health care team.
- iv. Respect the unique cultures, values, roles/responsibilities and expertise of other health professions.
- v. Work in cooperation with receivers of care, providers of care, and others who contribute to or support the delivery of prevention and health services.
- vi. Develop a trusting relationship with clients, families, and other team members.
- vii. Demonstrate high standards of ethical conduct and quality of care in one's contributions to teamwork.
- viii. Manage ethical dilemmas specific to Interprofessional client/ populations centered care situations.
- ix. Act with honesty and integrity in relationships with clients, families, and other team members.
- x. Maintain competence in one's own profession within scope of practice.

2.5.2 Domain 2: Roles and Responsibilities

Learning to be professional requires an understanding of how different professional roles and responsibilities complement each other in patient centered and community-oriented care. The diversity in roles is a resource as it gives a rich skill mix for team working and a problem too as it can be a source of conflict. There are nine specific roles and responsibility competencies under this domain (Schmitt et al., 2011). They include:

- i. Communicate one's roles and responsibilities clearly to clients, families, and other professionals.
- ii. Recognize one's limitations in skills, knowledge, and abilities.

- iii. Engage diverse health professionals who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs.
- iv. Explain the roles and responsibilities of other professionals and how the team works together to provide care
- v. Use the full scope of knowledge, skills and abilities of available health professionals and healthcare workers to provide care that is safe, timely, efficient, effective and equitable.
- vi. Communicate with team members to clarify each member's responsibility in executing treatment plan or public health intervention.
- vii. Forge interdependent relationships with other professions to improve care and promote learning.
- viii. Engage in continuous professional and Interprofessional development to enhancing team performance.
- ix. Use unique and complementary abilities of all in the team members to optimize patient care.

2.5.3 Domain Three: Interprofessional Communication

Communication is considered a core aspect of Interprofessional collaborative practice. When communication is incorporated in the training of future health professionals through IPE, there will be better communications among professionals in practice(Schmitt et al., 2011). It has eight specific communication competencies.

- i. Choose effective communication tools and techniques to facilitate discussions and interactions that enhance team function.
- ii. Organize and communicate information with clients, families, and healthcare team members in a form that is understandable, avoiding discipline-specific terminology when possible.

- iii. Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care options.
- iv. Listen actively, encourage ideas and opinions of other team members.
- v. Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from members.
- vi. Use respectful language appropriate for a given difficult situation, Interprofessional or conflict crucial conversation.
- vii. Recognize how one's own uniqueness like experience level, expertise, culture, power, and hierarchy within the healthcare team contributes to effective communication, conflict resolution and positive Interprofessional working relationships
- viii. Clearly communicate the importance of teamwork in patient- centered and community-focused care.

2.5.4 Domain Four: Teams and Teamwork

Learning to work in team's entails becoming a part of a small and complex system that is organized to share care to persons. The diversity of the professionals in a team can be a source of conflict especially on power, authority and professional expertise(Schmitt et al., 2011). When teamwork is included in IPE Curricula, then professionals are likely to have less conflicts. This domain has eleven specific teamwork competencies namely: -

- i. Describe the process of team development, roles and practices of effective teams.
- ii. Develop consensus on the ethical principles to guide all aspects of patient and teamwork.
- iii. Engage other health team professionals in shared patient-centered problem-solving
- iv. Integrate the knowledge and experience of other professions to inform care decisions, respecting patient and community values and priorities/ preferences for care.

- v. Apply leadership practices that support collaborative practice and team effectiveness.
- vi. Engage self and others to constructively manage disagreements about values, roles, goals, and actions that arise among healthcare professionals and with clients and families.
- vii. Share accountability with other health professions, patients and communities for outcomes relevant to prevention and health care.
- viii. Reflect on individual and team performance for individual and team performance improvement.
- ix. Use process improvement strategies to increase the effectiveness of Interprofessional teamwork and team-based care.
- x. Use available evidence in informing effective teamwork and team-based practices.
- xi. Perform effectively on teams and in different team roles in diverse settings.

2.6 Knowledge on IPE among Educational Administrators and Faculty

With the growth of IPE and practice in health professionals training, faculty members are expected to assume roles of developing and/or delivering IPE curricula innovations (Hoffman & Redman-bentley, 2017). Notably, IPE is helpful in fostering positive patient care, boost teamwork and improve health outcomes. However, faculty are not always prepared to prepare students for IPE. The faculty many a times have limited experience and expertise to facilitate IPE. It's therefore paramount to support and train faculty expected to develop, implement and facilitate IPE activities (Wilhelmsson, 2016). Some of the mechanisms that can be useful in faculty development are Peer reflection, Knowledge, Skills and Attitudes (KSA) transfer, group processes (to include managing differences and facilitating positive relations, group leadership, establishing trust and positive expectations), valuing diversity and roles and role modelling. How well these mechanisms are successful in fostering faculty to embrace IPE is dependent on institutional and individual commitment, attitudes and expectations of the programme (Wilhelmsson, 2016).

A study conducted in the USA among faculty of various health programmes from three campuses in two rural universities revealed that over 85% of faculty lacked awareness on IPE and didn't have any previous training on the same. The faculty lacked confidence in IPE knowledge, inability to train and also inability to solve conflicts resulting from IPE (Hinderer et al., 2016). Further, in a community-based study conducted on IPE among student nurses, dentists and medical students, the faculty involved felt they were under prepared to facilitate IPE. This meant they would benefit from further preparation (faculty development) (Scott , 2010).

2.7 Attitudes on IPE among Administrators and Faculty

A study conducted at Nebraska University; USA showed positive attitudes among faculty on IPE (Dallaghan et al., 2016). In another study nursing profession, age and gender were significant in influencing faculty's attitude towards IPE. Being a nursing faculty, younger and female showed higher positive attitudes. Years one had been a faculty showed no significance in this study(Gary & Bentley, 2017). In yet another study, nursing faculty had significantly higher mean scores than medicine faculty on attitudes towards IPE and teamwork. Being female and prior IPE experience were significant in this study while age, years of experience as a health professional had no significance to attitudinal responses(Curran et al., 2007). In Saudi, a study conducted among two universities showed favorable attitudes towards IPE. Just like the previous two studies reviewed on faculty attitudes this too showed that female faculty and those older viewed IPE more positively(Al-Qahtani & Guraya, 2016). Medical faculty expressed skepticism engaging in IPE while nursing and pharmacy showed positive attitudes in a study conducted among the three professions(Lash et al., 2014).

Though faculty reported low awareness on IPE in a USA rural universities'-based study, the same study reported high positive attitude scores on IPE. Faculty were willing to engage and learn about IPE as the perceived it as beneficial to teamwork, collaborative practice and could help break professional walls among professions. The study revealed

positive attitudes towards IPE and Interprofessional health care teams (IPHCT) among faculty (Hinderer et al., 2016).

In a USA based study, administrative faculty showed higher positive attitudes than the teaching faculty, this could mean if the programme is to be initiated there would be more support. High attitude among administrative faculty is attributable to exposure to best practices elsewhere and accreditation requirements (Hinderer et al., 2016). Another study among educational administrators revealed positive attitudes towards IPE. Gender (female) and years of experience in academia were found significant in influencing one's attitude towards IPE. In Canada, a study among educational administrators reported positive attitudes towards interdisciplinary team working (Curran et al., 2005). This same study found no significant differences in attitudes among academic disciplines (Delnart, 2012). A study among School Deans in the Western Pacific Region showed positive attitudes towards IPE among them (Lee et al., 2012).

Attitudes towards IPE is the single best predictor to faculty engagement in IPE (Lash et al., 2014). It is therefore paramount to increase sensitization to IPE especially its benefits to ensure full support by all the participating professionals. This can be achieved by institutionalizing faculty development towards IPE and having IPE programmes that ensure all involved participate as they will help boost confidence (Lash et al 2014).

2.8 Perceptions on IPE among Faculty

Evidence has revealed various benefits and challenges to IPE adoption. Faculty in a study conducted by de Vries et al reported high experiential gain after engaging in IPE, they became more comfortable and confident dealing with IPE, developed better communication and trust among colleagues (de Vries-Erich et al., 2017). There were however missed teachable opportunities when faculty engaged in IPE as beginners owing to lack of familiarity with the process but as they progressed they became better supervisors (de Vries-Erich et al., 2017).

In another study, the benefits of IPE to faculty included; it fosters teamwork and collaboration among professions, leads to shared knowledge and ultimately improve quality of training, helps faculty develop personal relationships and later shape their professional relationships, improves communication among professions and promotes mutual understanding (Bridges et al., 2011 , Carney et al., 2019). Faculty further reported job satisfaction, better resources utilization in terms of materials and human resource and better understanding of each other hence less rivalry and conflicts (Bridges et al., 2011). When students are taught in an interprofessional approach they develop interprofessional thinking, develop better personal relationships, improve their communication as peers and enhance professional confidence (Homeyer et al., 2018). The effects of IPE to the overall health care is that it reduces medical errors as a result of better communication, reduced inefficiencies in health care delivery and ultimately improved care outcomes and quality (Carney et al., 2019).

Several challenges facing IPE implementation have been reported in several studies. These include rigid curriculum and curriculum harmonization, constrained resources and finances, lack of motivation by faculty, different schedules and calendars, perceived value of IPE, lack of support from administration, prior negative experiences, differing knowledge levels across professions and turf battles (Dallaghan et al., 2016; Homeyer et al., 2018; Moyce et al., 2017; Steinert, 2005). In Western Pacific region, a study among school deans listed rigid curriculum, insufficient funding, scheduling, knowledge and attitudes gaps of faculty, time and inadequate administration support as some barriers to IPE implementation(Lee et al., 2012). Similar results were reported from a study conducted at the university of Washington (Abu-Rish et al., 2012). Faculty training came out strongly as the main way of reducing these challenges (Steinert, 2005). Administrative and policy makers support too is a key determinant of IPE success (Lee et al., 2012). This means for an IPE programme to succeed institutions must be willing to invest on resources, break rigidity to embrace change and even the training of faculty and other stakeholders. Faculty development programs to prepare them for IPE facilitation was key (Almalki et al., 2021).

2.9 Students Perceptions towards Interprofessional Education.

Several studies have demonstrated positive perceptions towards IPE among students (Syahrizal et al., 2020, Visser et al., 2017). Students who had negative perceptions reported that they were reluctant to study with other professions for fear of leaving their comfort zones and lose already developed bonds (Yune et al., 2020a). However, despite the positive perceptions in most studies, when asked what IPE was, 88.5% of students from a Korea study did not know. In the same Korean study, female students had better perceptions towards IPE compared to the male gender and there were no significant differences in perceptions towards IPE across professions (Yune et al., 2020a). Another study also showed favorable perceptions in female students than male (Berger-Estilita et al., 2020). In other studies, Nursing students had higher perceptions scores compared to students in other professions with medicine having lower attitudes which can be attributed to the traditional training approaches within professions (Syahrizal et al., 2020, Yune et al., 2020a).

There have been arguments on when IPE should be introduced in the training. Several studies found out that senior students had better attitudes towards IPE. This goes further to support the notion that IPE should therefore be introduced early in training to allow students to develop specific attitudes and competences on IPE (Alruwaili et al., 2020, Fawaz & Anshasi, 2019). In another study, students had divided opinion with some supporting its introduction early in training before students develop prejudices about one another while others were in support of its introduction in senior years as they felt it will foster networking and interpersonal support. (Berger-Estilita et al., 2020)

When IPE was assessed using the domains, communication domain scored better in perceptions in one study while all the other domains in another study showed no differences in students perceptions (Michalec et al., 2017, Visser et al., 2017). Some opportunities that could be tapped for IPE included debriefing, clinical learning due to shared clinical sites, community outreaches and attachments as well as common pedagogy units specifically designed for IPE (Walker et al., 2019). Some felt IPE needed

to be formal as a guiding policy improved perceptions while others included towards informal IPE. The downside of informal IPE was reported to be students may not take the course seriously and may therefore contribute to negative perceptions (Walker et al., 2019). Finding a balance between formal and informal IPE can improve acceptance by students (Michalec et al., 2017).

Many benefits accrue to students when they learn together. Some identified ones included teamwork, improved interprofessional and interpersonal relations, breaking professional silos and collaborative practice that eventually lead to improved care (Alruwaili et al., 2020, Visser et al., 2017).

From students' lenses, barriers to IPE included finding IPE hectic and of no value, varying program durations and curricula, tight schedules and not being a course requirement (Berger-Estilita et al., 2020, Walker et al., 2019). In a systematic review, individual level hinderances included mindset of training, gender related issues to IPE and stereotyping and therefore affective domain in adopting IPE can't be ignored. At the process level, curricula differences, lack of systems to support IPE and limited exposure are key barriers (Visser et al., 2017). Resources (time and money), fear to loose professional identity and lack of supportive infrastructure were cited as barriers in other studies (Almalki et al., 2021, Berger-Estilita et al., 2020)

2.10 Content areas for Interprofessional Education

Evidence has shown there is no standard content for IPE. Delivering content in a manner that inculcates the IPE competences is what is advocated for.

Case based learning with topics of interest that bring out interprofessional education have been widely used in many settings (Bridges et al., 2011). Packaging content that brings out IPE competences that could be delivered either in class, through simulations or in clinical based learning is a common practice in many universities in the USA. These content vary from one university to the other with some common themes being

critical thinking, communication skills, decision making, gerontology, medical ethics among others (Tullmann et al., 2013).

In a study In Sultan Qaboos University, Muscat, Oman bioethics, introduction or foundations of healthcare professional practice, leadership and management, research, quality improvement, communication subjects, critical thinking courses, case management, and deliberation were some content areas that health care students learnt together (Shakhman et al., 2020).

Evidence of using COBES approach to implement IPE has been successful in some universities in Ghana, Tanzania, Uganda, South Africa and Kenya. The students are taught community health units in interprofessional pedagogy approach followed with community attachment. There has been variations on the level of entry and durations (Amalba et al., 2020).

2.11 Modalities for Utilization of Interprofessional Education in Training

The best way students can learn from, about and with one another is still debatable as there are many forms and dimensions of learning approaches, which vary greatly within and between countries (Regmi & Regmi, 2016).

IPE to a great extent depends on the readiness of health care faculty to collaborate. When IPE is introduced at the beginning of pre-registration training for health care professionals, it attempts to prevent the formation of negative attitudes which may hamper IPE. When introduced early it will capitalize on readiness for Interprofessional learning and development of professional identities which are well formed from the start (Coster et al., 2008). It will have more impact than when introduced later in the programme when students have already formed individual professional identities and cultures (Ruebling et al., 2014). Williams et al., (2012) further argued while some authors support early career IPE, there are those who think IPE should be incorporated later in the curriculum after health care students have gained experience, insight, a sense

of their own profession identity and a much clearer idea of their future responsibilities in practice.

Several models of IPE do exist. What is common among all of them are the elements which are: - responsibility, accountability, autonomy, coordination, communication, cooperation, assertiveness and mutual trust and respect. A successful Interprofessional curriculum will ensure that students can experience, share, and practice these traits with each other (Bridges et al., 2011). What's common too among the modalities is they embrace the four core competencies of IPE namely: - Values and ethics, communication, roles and responsibilities and teamwork.

Models adopted for IPE implementation all over the world may be categorized into three namely:-Didactic models, simulation models and community based model (Bridges et al., 2011).

In didactic models the students go through some face-to-face hours of IPE content, the students then form IPE teams and later there is a clinical component to put what they learnt into practice. The content taught varies from institution to institution. Due to rigidity in curriculum or even the large scale nature of some schools, distance learning for IPE has been adopted (F. Gordon et al., 2010). Modules for IPE are developed and modalities of when to take it agreed among the participating schools. In a New-York study, participating schools revealed that distance learning significantly help deliver IPE and improved teamwork and roles understanding (Cannistraci et al., 2018).

In simulation IPE, University of California School of Medicine and School of Nursing developed simulation IPE (SIM-IPE) that has been described as a great success (Tullmann et al., 2013). University of Washington developed a simulation skills package to be integrated in the curricula of nursing, pharmacy, and medicine programmes. Simulated intensive care with a case of severe arrhythmias and emergency setting case of an acute asthma exacerbation were developed. The students from the three professions practice together in these cases (Bridges et al., 2011). In a study in Germany to test the

feasibility of SIM-IPE, it was reviewed that simulation training was feasible and equipped learners with collaborative and teamwork experiences (Tullmann et al., 2013). Simulation helps the participating profession to practice together and understand each other's roles as learning together alone can't make them team players.

Community based IPE involves participating professions engaging in community settings to deliver care collaboratively as each engages on their role. An example of Community IPE is the Students Providers Aspiring to Rural and Underserved Experience (SPARX) of University of Washington. In SPARX staff and students collaboratively develop topics and projects. It involves forums and seminars on topics of interest, training to develop skills and service projects to give experiential learning and foster collaborative teamwork (Bridges et al., 2011). In Africa, The University for Development Studies, School of Medicine and Health Sciences (UDS-SMHS) of Ghana, Makerere University in Uganda college of health sciences(MUCHS) and Moi University, College of Health Sciences, Kenya have COBES programme (Amalba et al., 2016; Chang et al., 2011; Mining, 2017). Though the three COBES vary in implementation, what's common is they employ problem-based approach to learning and students are grouped in IPE teams early in the programmes from all the participating schools. Supervision is done by faculty members from all the schools too and COBES in the three universities is an examinable course.

Some institutions have combined several modalities in IPE implementation. In Australia at Griffith University, a three- phase pedagogy approach to IPE implementation was adopted. Phase one is Didactic, Phase two, Simulation IPE at the skills laboratory and phase three is a real patient experience. One main challenge to this approach was its difficult to implement on the large scale (Teodorczuk et al., 2016).

2.12 Theoretical Framework

Interprofessional Education has been critiqued as being more descriptive and atheoretical (Barr, 2013). There isn't therefore, one single theory that best describes and

support it. In this regard the researcher borrowed tenets from Grounded Delphi Method (GDM). It combines elements from grounded theory and Delphi technique(Howard, 2018). Grounded theory was employed in the qualitative enquiry using FGDs and KIIs. Modified Delphi was used in the review and validation of the model. The process of GDM involves four step namely data collection, concept discovery, concept prioritization and finally theory development (Moe, 2011).

Step one was data collection. This was done quantitatively in phase 1 of the study to measure knowledge and attitudes towards faculty at JKUAT and qualitatively through FGDs and KIIs to explore perceptions towards IPE, modalities, and content areas for IPE.

Step two was concept discovery. Analysis of data from phase 1 and phase 2. This generated the knowledge level and attitudes towards IPE. For the qualitative data, axial and selective coding was applied to generate themes that described the perceptions of faculty and students, the content areas, and preferred modalities for IPE.

Step three - concept prioritization. In this step the researcher developed a model basing it on data from step 1 and 2. The model was subjected to experts for review and validation using modified Delphi technique (Keeney et al., 2021).

Step 4 involved developing the final model for submission that incorporated the suggestions for improvement from the experts. Figure 1 illustrates GDM(Moe, 2011).

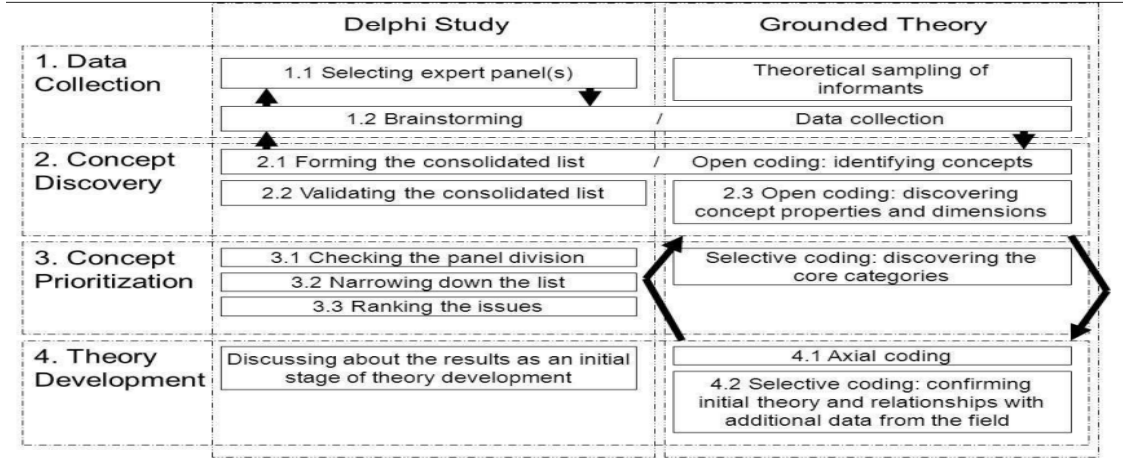


Figure 2.1: Grounded Delphi Method Theory

2.11 Conceptual framework

Knowledge and attitudes among faculty was established upon data collection in phase 1 of the study. This yielded the status of IPE at JKUAT. Qualitative data collection was done using FGDs and KIIs.

This shaped an in-depth concept enquiry that generated faculty and students’ perceptions towards IPE and the content areas and modalities for IPE. The characteristics of faculty in this study that included age, gender, academic position, years of experience in profession, years of experience in teaching and expertise level and their influence on knowledge and attitudes towards IPE are included. Further the education policies and administrative support do affect IPE and hence included. This research envisions to unpack this further. Faculty development in terms of knowledge and attitudes facilitated by administration and embedded in policy will ensure faculty are well equipped to deliver IPE. All these shaped the concept characterization that aided in model development. In the last step, the researcher envisioned to develop a model that show the content areas, modalities and the strategies that will be used to integrate IPE into curricula. This is illustrated in Figure 2

Independent variables Intervening factors Dependent Variable

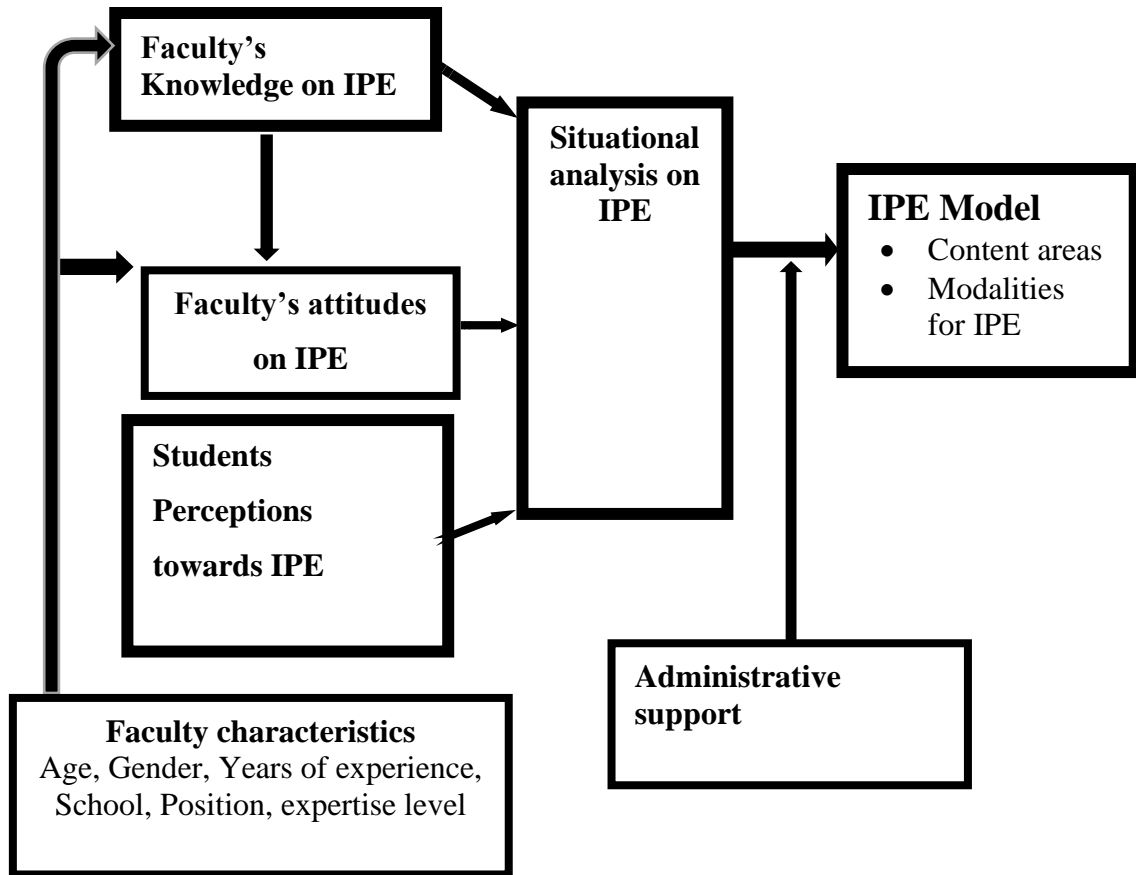


Figure 2.2: Conceptual Framework

CHAPTER THREE

MATERIALS AND METHODS

3.1 Introduction

This chapter highlights the research design and methods that were utilized in this study. It explains the design, study area, the study population, tools, procedures, data management and the ethical considerations for the study.

3.2 Study area

The study was conducted at the College of Health Sciences in JKUAT Main Campus. It is in Kiambu County in Juja town of Kenya. JKUAT is one of the public chartered universities offering a wide range of programmes and of interest to this study are Health Sciences Programmes. It is located approximately 30 kilometers from Nairobi central business district (CBD) and 1 kilometer from the Thika superhighway at the Juja turn off.

College of Health Sciences has five schools namely: - School of Nursing, School of Medicine, School of Biomedical Sciences, School of Pharmacy and School of Public Health. These schools share learning facilities including classrooms, library, and laboratories. The students from these schools interact during their clinical learning and community health attachments as the facilities are shared. The faculty from the schools interact too and, in some instances, teach across the schools. It was chosen as it trains a wide mix of health professionals and has no form of structured IPE.

3.3 Study design

The study adopted Explanatory Sequential Mixed Method Design. This design is desired as it allows collecting of rich, comprehensive, and in-depth data by employing both qualitative and quantitative data collection methods. The design allowed point of

interface at the data collection and at data interpretation stages. It was in three phases building up to each other. Phase one involved using a knowledge questionnaire and an adopted attitude scale comprising of 3 subscales to collect data on knowledge and attitudes of Faculty on IPE. This was analyzed and informed phase two. This phase yielded quantitative data. Phase two involved collecting qualitative data through Focused Group Discussions (FGDs) among faculty members and students sampled from the five schools and key informant interviews among the College Principal, School Deans in the college and one IPE grants lead person at the college. Data was analyzed and triangulated with that from phase one. The findings informed phase 3 of the study which involve developing an IPE model for JKUAT, COHES.

3.4 Study population

This study used faculty at COHES for the quantitative arm and both faculty and students for the qualitative arm of the study. These include faculty from the school of nursing, school of biomedical sciences, school of medicine, school of pharmacy, and the school of public health. The deans, the college principal and JKUAT IPE related grants lead person. There are a total of one hundred and fifty-eight (158) faculty members and seven key informants. Beneficiaries of IPE related grants and class representatives in the 2 senior most years from all the programmes in the college were added. They are approximately 22 class reps and 40 HEPI and STRIPE-HIV Grant's beneficiaries.

3.4.1 Inclusion criteria

- Willingness to participate in the study
- The college principal, deans at the COHES.
- Full Time Faculty members in the five schools at COHES
- Inteprofessionalism related grants lead person in JKUAT
- Class representatives from two senior most years in all programmes at the college
- Student beneficiaries of HEPI and STRIPE-HIV grants.

3.4.2 Exclusion criteria

The researcher's academic supervisors since they are faculty members at COHES.

3.4.3 Sample size determination

Cochrane Equation as cited in Israel, 2003 was used to calculate the minimum sample size for faculty.

$$\text{Formula: } n_0 = \frac{z^2 pq}{e^2}$$

n_0 =desired sample size

Z=standard normal deviant at the required confidence level in this case it is 95% confidence interval hence the standard normal deviate is set as 1.96

p= the proportion in the target populations estimated to have the knowledge and attitudes on IPE. Fifteen (15) % of respondents in a study in the USA had Knowledge on IPE(Hinderer et al., 2016).

q= is the proportion of the population estimated not to have Knowledge on IPE whereby (q=1-p). in this case 85%.

d=the desired degree of precision/accuracy at 5% (0.05)

$$n = \frac{1.96^2 * 0.85 * 0.15}{0.05^2}$$

$$= 3.8416/0.0025 = 195.9216$$

Since the target population was less than 10,000, the sample size was adjusted using the

following formula

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where n_0 = the desired sample size when population is more than 10,000

n = the desired sample size when population is less than 10,000

N = the estimate of the population size

Hence $n_0=196/1+(196-1/159) =196/1+(195/159) = 196/2.2265=88.0334=88$

Hence the Sample size for faculty is 88 respondents

3.4.4 Sampling technique.

The respondents for phase one of the study were selected using stratified sampling method where the schools formed the strata. Simple random sampling was used to pick participants proportionately from each stratum (See Table 3.1).

In phase two, for the FGD, purposive sampling method was applied. Three FGD were conducted comprising of eight, seven and nine (24) faculty members respectively drawn from the five schools. All the six key informants were interviewed. Following a study amendment, the researcher conducted 4 FGDs comprising of eight, nine, seven and eight students (32) at the college. Students who have undertaken the HEPI and STRIPE-HIV sponsored research fellowship and class representatives in senior years from all the programmes at the college were included.

Table 3.1: Faculty Sample Size Tabulation

No.	Programme	Faculty Population	Faculty Sample size
1.	School of Nursing	16	9
2.	School of Pharmacy	15	8
3.	School of Medicine	61	34
4.	School of Biomedical Sciences	50	28
5.	School of Public Health	17	9
	Total	159	88

3.5 Data Collection

3.5.1 Data collection tools and equipment

The study employed a questionnaire, attitude scales, focused group discussions (FGDs) guide and key informant interviews (KIIs) guide as data collection tools. A voice recorder was used to record interview proceedings during FGD and KII interviews. The tools were coded and had an unidentifiable number for anonymity

3.5.1.1 Knowledge Questionnaire

The questionnaire had general bio-demographic data and knowledge questions with specific YES and NO questions on IPE knowledge. The questionnaire had been developed from reviewed literature and pretest before administration for data collection. It was delivered online using google tools platform. See appendix 4.

3.5.1.2 Attitude Scale

Attitude was determined using three subscales. The first scale was a 10 item scale to assess attitudes towards IPE adopted from Curran et al., (2007). Second was a 10-item scale to measure IPE attitudes among healthcare teams (ATHCT) scale. The third tool is

a 10 item Likert scale to assess attitudes of IPE in academic setting. These scales are available at National Centre for Interprofessional Practice and Education Resource Centre (NEXUS) website-USA. The tools were developed to foster Interprofessional education and collaborative practice research. The tools are not copy righted and have never had any license. They are in the public domain and uploaded in the website resource center and no permission is required prior to their use. However, a notification of intention to use was sent to the authors via email and a reply received. The researcher modified the tools to fit the local context and some items were removed following pretesting. The attitude scales are on a five- point Likert scale (Strongly agree = 5, agree = 4, neutral = 3, disagree = 2 and strongly disagree = 1) with a highest score of 150 and Lowest score of 30. See appendix 5.

3.5.1.3 Focused Group Discussion Guide

This was to guide the researcher in the FGD. One guide was prepared for faculty and another for students. They were developed from literature review and modified after analyzing of phase one data. The probe questions were reviewed after every FGD to include further probes for questions not saturated. See appendix 6 and 8.

3.5.1.4 Key Informant Interview Guide

The KII guide was developed to guide the researcher in conducting KII. It was developed from literature review and was modified after analyzing phase one data. See appendix 7.

3.5.1.5 Study Instrument (Voice Recorder)

A Sony audio Recorder was used to record FGDs and KIIs. The recorded proceedings aided transcription of the qualitative data of the study.

3.5.2 Quality Assurance

3.5.2.1 Training of research assistants

Two research assistants who are health professionals were sensitized on the expectations, study objectives and the tools to be used to assist in FGDs and KIIs.

3.5.2.2 Reliability and Validity

Knowledge questionnaire was pre-tested at KU using 17 respondents and yielded Cronbach co-efficient of 0.722. The internal consistency of the items in the three attitude sub-scales was tested and yielded a Cronbach alpha of 0.729, 0.811 and 0.707 respectively. A Cronbach co-efficient of 0.7 is acceptable (Hinderer et al., 2016). Test of reliability guided questionnaire revision where items with low scores were removed.

The researcher trained the research assistants before commencement of data collection on the objectives, purpose of the study and the instruments to be used for data collection.

3.5.3 Study Procedures

In view of COVID 19 pandemic, questionnaires were converted into google forms and emailed to the study participants using institutional emails. The tool was accompanied by an informed consent document. A participant going ahead to fill to the google tool was assumed to have consented. The study was conducted in three phases building up to each other. The first phase was quantitative involving administering of online questionnaires on knowledge and an attitude scale to the faculty members from the five schools. Though the attitude scales are adopted, additions and changes were done to enrich it and to fit the local context. This yielded the situation analysis of the state of IPE at JKUAT. The data was analyzed, and the results informed phase two of the study.

Phase two was qualitative in nature. The researcher conducted three FGDs among faculty members from the five schools. The 1st involved the faculty from the school of

nursing and had 8 participants. The second involved faculty representatives from the three programmes within the school of medicine and had 7 participants. The last FGD among 9 participants was done as a mixed group after the researcher noticed repetition and the need to involve all schools before reaching saturation. The 3rd FGD too was used to reach consensus. The 1st FGD was conducted face to face while the 2nd and 3rd FGD were done using ZOOM platform. Among students, the researcher conducted 4 FGDs of 8, 9, 7 and 8 students (32) at the college. All were conducted online using ZOOM platform. The 1st involved beneficiaries of IPE grants at the college while the 2nd and 3rd involved class representatives of the two senior most years of various programmes across the college. The 4th was a mixed FGD and was used to build consensus. The FGDs were explored knowledge, attitude, content areas and preferred modalities for IPE implementation. A date and time for the FGD was communicated to the participants through a telephone call with a link and a reminder sent via SMS the morning to the FGD for the online and a venue, time and date was communicated for FGD 1. The numbers 7-9 in the FGDs were small enough to allow all the members to actively participate yet big enough to allow for varied and divergent views from participants (Nyumba et al., 2018). On the day of FGD, consent document was read out to the participants and verbal consent gotten for the physical and inferred by accepting to continue for the virtual. The moderator who was the researcher explained in detail the background of the study and the reason for their selection as part of the focus group. To maintain objectivity, the moderator instructed the group to share their opinions freely about the topic at hand and respect each other's opinion. The researcher moderated the discussions guided by a FGD guide (Appendix 6 and 8) while a research assistant was taking notes and noting any non-verbal communication cues from the group during the discussion for the researcher. A voice recorder for physical and meeting recording for the online was used to record the discussion to be listened later and transcribed should the research assistants have missed any points during notes taking. One FGD approximately took an hour. Transcription was done from the recordings by a research assistant with the researcher doing a double check and any identifiable stripped off to maintain anonymity and confidentiality of the respondents. After FGDs, the researcher

proceeded to conduct KII among the seven selected participants in the study. These are the educational administrators in COHES i.e., 1 College principal, 5 Deans of each of the schools in the college and 1 IPE grants lead person. The researcher approached them individually and ask for their informed consent to take part in the study and their convenient time for an face to face interview. A recording device was used to back up the notes the researcher was taking from the interview. The KII approximately took thirty minutes. Arising from interviewing key informants and FGDs from faculty, the researcher saw need to include students in the study. Thereafter, four focused groups were conducted among HEPI and KIT-HIV grants beneficiaries and class representatives all the senior year students of all the programmes at COHES. This phase yielded the content areas, modalities, and strategies for adoption of IPE at JKUAT.

The third phase of the study involved using information gathered from Phase one and two in the development of an IPE model. The developed model was given to seven experts for review and validation against a predetermined evaluation checklist using modified Delphi Technique. The experts were drawn from across varied health sciences disciplines. One had to have at least 10 years of university teaching experience and must have had experience in IPE to be considered an expert. Changes suggested were incorporated into the model before producing a final copy.

3.6 Data Management

3.6.1 Data Cleaning and entry

The data was checked for completeness and edited for accuracy to eliminate unusable data, inaccuracies, and errors to ensure consistency. Electronic data generated was stored in a laptop set aside for the research and was password protected. Hard copy data was filled in box files and stored in a lockable cupboard.

Data excel sheet was exported from google forms for analysis.

3.6.2 Data Analysis and Presentation

3.6.2.1 Quantitative data

Analysis was done using SPSS software Version 25.0. Descriptive statistics was used to analyse quantitative data at 95% confidence level.

Knowledge and attitude were measured using modified Blooms cut off (Seid & Hussen, 2018). Score was converted into a percentage for interpretation. Scores of $\geq 80\%$ (10-12 score) denoted good knowledge, $< 80\%$ (<10 score) as poor knowledge. Scores $\geq 75\%$ (112/150 points) was considered positive attitude with $<75\%$ (<112 points) as negative attitudes. Shift from centrality bias was considered in determining the cut off where the midpoint neutral score was considered negative and negatively framed questions were reversely scored.

Chi-square was used to determine any relationship between gender, age groups, years of experience as health professionals and years of experience as health professional educators for the research variables of knowledge and attitudes of IPE among faculty.

Logistic regression was used for Binary data analysis (Knowledge and not knowledgeable, negative attitude or positive attitude) of IPE among faculty relating it to bio-demographic data.

The study findings were presented in form of narrations, tables, graphs and pie charts as appropriate

3.6.2.2 Qualitative data analysis and presentation

The qualitative data generated from the FGDs, and KIIs was transcribed first then analyzed using NVIVO version 12 software. Researcher and one research assistant read through the transcripts against the audio records to confirm that the transcripts were correct. Data collection was done concurrently with analysis. Thematic analysis was

done by reading transcripts multiple times identifying codes and categorizing them into meaningful themes and subthemes.

Three levels of coding were applied. 1st round employed open coding that generated child nodes. The 2nd round involved axial coding that involved pairing related codes to form subcategories, which would inform themes using both deductive and inductive reasoning. Lastly selective coding was done where sub-categories were grouped to form the main themes (parent nodes) (Bingham & Witkowsky, 2022).

To ensure reliability of the analysis, an independent coder was used to code one FGD and one KII and consensus on codes arrived with the researcher. The researcher's academic supervisors verified the codes and the themes generated thereof from the software. Qualitative data was presented using text narrations and supporting verbatim excerpts to amplify the voices of the participants.

Quantitative and qualitative data triangulation was done to enrich discussions and study conclusions.

3.6.3 Model development

This was developed in phase 3 of the study

The researcher based the model development on Grounded Delphi Method (GDM). It combines elements from grounded theory and Delphi technique (Howard, 2018). The process of GDM involves four steps namely data collection, concept discovery, concept prioritization and finally theory development (Moe, 2011). Steps 1 and 2 comprised round one of model development process which yielded the proposed model while step 3 and 4 was the round 2 of the model development process which involved model validation by experts and development of final model.

Step one- data collection. Questionnaires and attitude scales were used for quantitative data collection (Phase 1) and FGDs among faculty and students and KIIs used for qualitative data collection (Phase 2).

Step two- concept discovery. Analysis of data from phase 1 and phase 2 of the study to establish the status of IPE knowledge and attitudes among faculty at JKUAT and the content areas and preferred modalities for IPE was done. Students' opinions were also sought which enriched the data from faculty. FGD 3 among faculty and FGD 4 among students were used to build consensus. KII were building into each other for consensus.

Step three - concept prioritization. Basing arguments from the two phases and literature reviewed, the researcher put together a model showing relationship of the various variables, stakeholders involved, their roles and the strategies towards IPE integration. The researcher then employed modified Delphi technique where she subjected the proposed model to a panel of experts to review the model using a predetermined dichotomized checklist with one open question (Appendix 9) suggesting areas of improvement to the model. Upon review, the researcher checked for consensus and repeated the revision until there was consensus. This research considered reaching consensus if $> 70\%$ of the experts agreed to the statements of the validation checklist and $< 15\%$ disagreed (Keeney et al., 2021).

Step 4 involved developing the final model for submission. Upon consensus the final model was developed and incorporated into the research document.

3.6.4 Dissemination of results

Dissemination of results shall be done to the university in form of thesis, and the scientific community through presentation in conferences as well as publication in peer reviewed journals.

3.7 Ethical considerations

The research was approved by JKUAT's Ethical Review Committee (ERC) – REF: JKU/2/4/896B and NACOSTI REF: 126166. Permission was sought from KU and from JKUAT Administration to carry out the pretest and study respectively. Confidentiality of the respondents and research data was always maintained in all the phases of the study. The identity of the participants was protected in that though the researcher used their work emails to send the online tool upon filling the responses couldn't be linked to the respondent as no names or any identifying information was solicited in the tools used. An informed consent was obtained from all the respondents. The participants were taken through the consent process by the researcher or the research assistants. This process involved explaining to the respondent what consent is, reason for taking consent and the purpose of the consent form. The respondents were taken through all the components of the consent form to ensure that they understand the purpose of the study, the process, benefits, and the voluntariness to participate in the study. Those who consented to participate in the study, were required to sign informed consent form. Data collection was done at the pick of Covid, the researcher sought amendment of the Ethical approval and conducted the FGDs using online platform and converted the questionnaire and administered it online using google tools.

3.8 Assumptions of the study

This study assumes that though no formal IPE exist in the training of Health professional at JKUAT, the faculty are aware what IPE is.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter highlights the research results, it includes both the quantitative and qualitative data. A total of 71 online questionnaires were filled representing 81.8 % response rate for the quantitative arm. Seven FGDs (three among faculty and four among students) and six KIIs were conducted in the qualitative phase of data collection. One KII was the researchers' academic supervisors hence was not interviewed. A total of 24 faculty participated in the FGDs across schools with 32 students drawn from HEPI programme beneficiaries and class reps of the senior most cohorts of students in the college.

4.2 Faculty's Demographic Information

Slightly more than half, 57.7% (41) of the respondents were male. Almost half 46.5% (33) of them held the lecturer position. There were more respondents from the school of medicine, 45.1% (32) with the school of pharmacy having the least 8.8% (6). The respondents' mean age was 42 years with slightly more than half, 52%, (37) aged between 35-44 years. On years of experience, 16 years and 6.6 years were the mean years as health professionals and in teaching respectively as shown in Table 4.1.

From the qualitative arm of the study, Male participants were more, the school of medicine had more participants with the middle level cadres having more participants just like in quantitative study. This is summarized in Table 4.2.

Table 4.1: Faculty's Demographic Information from quantitative phase

Variables	n=71	% (n)	Mean SD)
Gender	Female	42.3 (30)	
	Male	57.7 (41)	
Age in years	25-34	11(15.5)	41.6(6.5)
	35-44	37(52)	
	45-54	22(31)	
	55-64	1(1.5)	
Academic Position	Graduate Assistant	2.8 (2)	
	Tutorial Fellow/ A. Lecturer	29.6 (21)	
	Lecturer	46.5 (33)	
	Senior Lecturer	18.3 (13)	
	Associate Professor	2.8 (2)	
School	Public Health	14.1(10)	
	Medicine	45.1(32)	
	Nursing	18.3 (13)	
	Biomedical Sciences	14.1(10)	
	Pharmacy	8.5 (6)	
Years of experience in health profession			16 (6.8)
Years of experience in teaching			6.6 (3.9)

Table 4.2: Biodemographic characteristics for the Qualitative phase

	Variable		n (%)
Faculty FGDs	Age	35-44	18 (75)
		45-54	4 (16.7)
		55-64	2 (8.3)
	Gender	Male	15 (62.5)
		Female	9 (37.5)
	School	Public Health	2 (8.3)
		Medicine	9 (37.5)
		Nursing	9 (37.5)
		Biomedical Sciences	2 (8.3)
		Pharmacy	2 (8.3)
	Academic position	Graduate Assistant	1 (4.16)
		Tutorial Fellow/ A. Lecturer	10 (41.6)
		Lecturer	11 (45.8)
		Senior Lecturer	2 (8.3)
		Professor	1 (4.16)
N=25			
Students FGDs	Age	20-24	22 (68.75)
		25-29	10 (31.25)
	Gender	Male	20 (62.5)
		Female	12 (37.5)
	School	Public Health	6 (18.75)
		Medicine	10 (31.25)
		Nursing	5 (15.6)
		Biomedical Sciences	6 (18.75)
		Pharmacy	5 (15.6)
	Level in Training	3 rd Year	4 (12.5)
		4 th Year	10 (31.25)
		5 th Year	10 (31.25)
6 th Year		8 (12.5)	
N=34			
KIIs	Age	40-55	4 (66.7)
		56-75	2 (33.3)
	Gender	Male	6 (100)
	School	Public Health	1(16.7)
		Medicine	3(50)
		Biomedical Sciences	1(16.7)
		Pharmacy	1 (16.7)
		Academic position	Senior Lecturer
	Associate Professor	1 (16.7)	
	Professor	2 (33.3)	
N=6			

4.3 Knowledge on Interprofessional Education and Related Information

4.3.1 Interprofessional Education Definition

Using an open-ended question, the respondents were asked what they understood by the term Interprofessional education. Responses from this question were grouped into the categories described in Table 4. More than half, 59%, (42) of the respondents explained IPE as learning together common subjects or where learning from different disciplines is taught with each other. Nine participants (13%) gave the correct definition of IPE.

Table 4.3: IPE Definition

Definition	No.	%
Learning with each other	42	59
Learning about each other	2	3
Learning from each other	2	3
Learning with and about each other	6	8
Learning with and from each other	5	7
Learning with, from and about each other	9	13

When the same was asked in the qualitative phase of the study, some participants viewed IPE as learning together/shared learning as was in the quantitative arm with others bringing in aspects of learning about and from each other to define IPE as sampled from the FGDs below.

“I think inter-professional learning is whereby people from different fields in a certain institution are learning together” (FGD 1 F).

“A situation where students from different health professions are taught or have shared the same learning experience that could either be in lecture theatres, clinical experience or conferences and seminars but we also add the aspect of where various professions come together there is exchange of knowledge or even attitudes about each other with better understanding of what the other profession does. That’s what I would add” (FGD 3 F).

4.3.2 Faculty's knowledge Scores on IPE

To measure the level of knowledge among faculty, respondents were asked to respond with a Yes or No against 12 questions on IPE. The mean score on Knowledge was 9.62 ± 0.12 (9.5 to 9.74) which was $> 80\%$ cutoff. (Seid & Hussen, 2018). Respondents in this study therefore had good knowledge on IPE by score. More than half, 55%, (40) of the participants had good knowledge

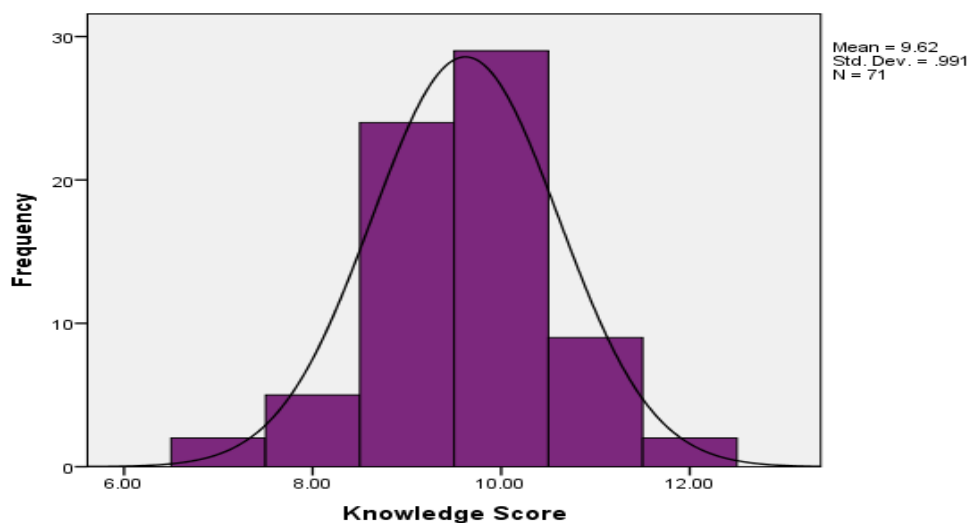


Figure 4.1: Knowledge Score Histogram

4.3.3 IPE Expertise and application at JKUAT

Using four levels of expertise, respondents were asked to rate their IPE knowledge. More than half of the respondents 59.2% (42) were novices while 29.6% (21) were not familiar at all with the concept of IPE. Only one respondent was an expert in IPE. When asked if they had applied IPE at JKUAT, only a quarter, (25.4%, 18) of the respondents had. Further when asked if they would support IPE integration, majority 93% (66) answered to the affirmative, with almost a similar number 94.4 % (67) preferring a blended mode for IPE implementation. (See Table 4.4).

Table 4.4: IPE expertise, Application, support, and preferred modality

Question	Response	No	%	p-Value
Current expertise in IPE	Not familiar	21	29.6	0.001
	Novice (some familiarity)	42	59.2	
	Experienced	7	9.9	
	Expert	1	1.4	
Application of IPE at COHES JKUAT	N/A	5	7	
	No	48	67.6	
	Yes	18	25.4	
Support towards IPE activities by faculty	No	5	7	
	Yes	66	93	
Preferred modalities	Classroom teaching	4	5.6	
	A blend of two or More	67	94.4	

The FGD among faculty and students and KII participants unanimously agreed they would support IPE initiatives if they were to be initiated at JKUAT. Some of the participants' remarks highlighted below: -

“These are things which need to be explored because there is really no point of looking like we are going to have different patients once the students finish training they will just go and find that they are working with the same people and I think that it is a bit embarrassing when they reach the wards and then they are probably meeting their colleagues who they schooled with here but then they are just too new to each other”. (FGD 2 F)

“It is an idea whose time has come. The research elective we did supported by HEPI was very enlightening. Personally, I appreciated especially the nursing students when we needed to learn skills, we thought were easy, but we realized we didn't”. (FGD 3, S)

“I would fully support it. I think its overdue at JKUAT.” (KII 5)

There was congruence between the quantitative and qualitative arms of the study where both reported willingness of the respondents to support IPE initiatives.

4.3.4 Reasons for supporting/not supporting IPE among faculty

From the quantitative arm, the researcher sought to know if faculty would support IPE and their reasons for and against. Majority (93%, 66) indicated that they would support IPE, citing collaborative practice, fostering teamwork, helping in resource management, and improving the quality of training as their reasons for supporting as summarized from the open-ended responses. Those against supporting IPE (7%, 5) cited differing syllabuses, not being familiar with IPE, time consuming and causing identity crisis and confusion to students as summarized in table 4.5.

Table 4.5: Reasons for supporting/not supporting IPE

Reasons for supporting	No	%
Promotes Collaborative practice	24	33.8
Improved Quality of training	18	25.3
Good Resources Management	12	16.9
Fosters Teamwork	12	16.9
Reasons for not supporting		
Its already happening e.g., Entrepreneurship	1	1.4
Its time consuming	1	1.4
Differing syllabuses across schools	1	1.4
Am not familiar with IPE	1	1.4
Creates confusion and identity crisis among Students	1	1.4

4.4 Faculty’s attitude on Interprofessional Education at COHES, JKUAT

A 30 item Likert scale with a total score of 150 was used to measure attitudes of faculty on IPE using three subscales namely: - Attitudes towards IPE scale (10 items), IPE attitudes among healthcare teams (ATHCT) scale (10 items) and attitudes of IPE in academic setting scale (10 items). The mean attitude score was 118.11 (>75%). (SD 9.7, SE 1.55). The overall attitude score was therefore positive. Attitudes towards IPE scale

yielded a mean score of 44.76 >75%, while IPE, ATHTC scale score was 42.84 >75% and attitudes of IPE in academic setting scale score was 36.86(<75%). Slightly more than half (52.1%, 37) of the respondents had positive attitudes. While subscale 1 and 2 yielded positive attitudes, attitudes of IPE in academic setting scale yielded negative score. See tables 4.6, 4.7 and 4.8).

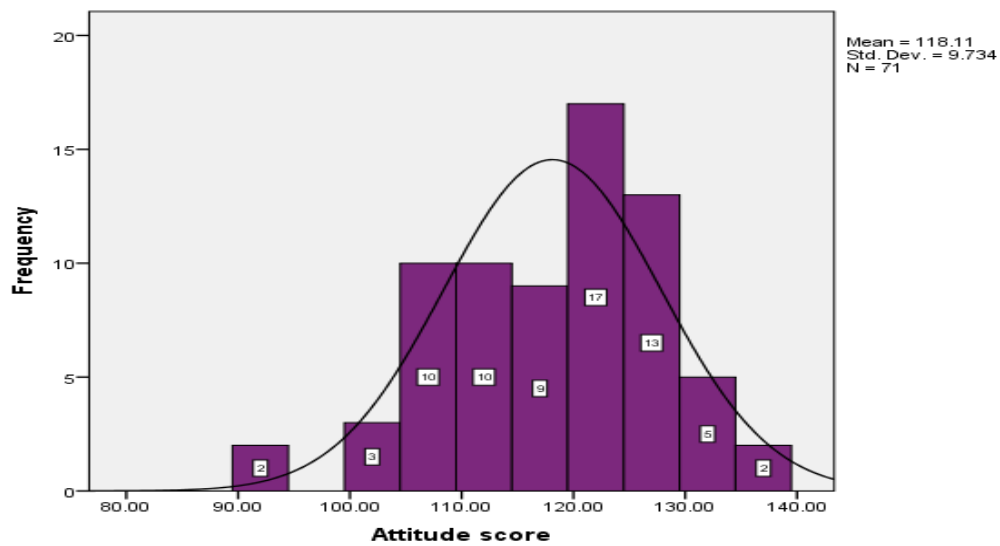


Figure 4.2: Attitude score Histogram

Table 4.6: Attitude towards Interprofessional education

No	Scale 1: Attitudes towards Interprofessional Education	N	Min	Max	Mean	Std Error	Std. Dev
1	Interprofessional learning will help students think positively about other health professionals	71	3	5	4.65	0.07	0.56
2	Students in my professional group would benefit from working on small-group projects with other health profession students	71	3	5	4.56	0.07	0.58
3	Communications skills should be learned with integrated classes of health care students	71	3	5	4.62	0.06	0.54
4	Interprofessional learning will help to clarify the nature of patient problems for students	71	2	5	4.37	0.09	0.74
5	It is not necessary for undergraduate health care students to learn together	71	1	5	4.21	0.12	0.97
6	Learning with students in other health professional schools helps learners to become more effective members of a health care team	71	1	5	4.49	0.09	0.79
7	Interprofessional learning among health care students will increase their ability to understand clinical problems	71	2	5	4.39	0.086	0.73
8	Interprofessional learning will help students to understand their own professional limitations	71	2	5	4.30	0.09	0.76
9	Interprofessional learning among health professional students will help them to communicate better with patients and other professionals	71	3	5	4.47	0.07	0.56
10	Team-working skills are essential for all health care students to learn	71	3	5	4.7	0.06	0.49
Totals			23	50	44.76		

Table 4.7: Attitudes towards interprofessional health care teams

No.	Scale 2: Attitudes towards interprofessional health care teams	N	Min	Max	Mean	Std. Er	Std. Dev
1.	Clients receiving Interprofessional care are more likely than others to be treated as whole persons	71	3	5	4.58	0.07	0.62
2.	Developing an Interprofessional client care plan is time-consuming	71	1	5	3.04	0.12	1.03
3.	Interprofessional approach makes the delivery of care more efficient	71	2	5	4.48	0.08	0.65
4.	Developing a client care plan with other team members avoids errors in delivering care improving decision making	71	2	5	4.48	0.08	0.65
5.	Working in an Interprofessional manner unnecessarily complicates things most times	71	2	5	4.14	0.10	0.82
6.	The Interprofessional approach improves the quality of care to clients	71	3	5	4.5	0.07	0.60
7.	Health professionals working as teams are more responsive than others to the emotional and financial needs of clients	71	2	5	4.06	0.11	0.94
8.	Having to report observations to a team helps team members better understand the work of other health professionals	71	2	5	4.5	0.08	0.65
9.	Hospital patients who receive Interprofessional team care are better prepared for discharge than other patients	71	2	5	4.48	0.09	0.73
10.	Team meetings foster communication among members from different professions or disciplines	71	3	5	4.58	0.07	0.58
Total			22	50	42.84		

Table 4.8: Attitudes towards interprofessional learning in the academic setting

Subscale 3	Attitudes towards interprofessional learning in the academic setting	N	Min	Max	Mean	Std Err	Std. Dev
1	Interprofessional learning better utilizes resources	71	3	5	4.51	0.07	0.56
2	Students like courses taught by faculty from other academic departments	71	1	5	3.11	0.11	0.99
3	Students like courses that include students from other academic departments	71	1	5	3.18	0.10	0.83
4	Faculty at COHES should be urged to participate in Interprofessional courses	71	2	5	4.24	0.08	0.71
5	Faculty like teaching students in other academic departments	71	1	4	2.87	0.09	0.74
6	Faculty like teaching with faculty from other academic departments	71	1	5	3.06	0.09	0.77
7	Interprofessional efforts weaken course content	71	1	5	4.169	0.08	0.70
8	Interprofessional efforts require support from college/university administration	71	2	5	4.58	0.07 1	0.60
9	Faculty should be rewarded for participation in Interprofessional courses	71	2	5	3.54	0.09	0.82
10	Accreditation requirements limit Interprofessional efforts	71	1	5	3.59	0.13	1.06
Total Attitude score			15	49	36.86	1.55	9.7

4.5 Hypothesis Testing

HO1: The null hypothesis, there is no relationship between faculty's knowledge and their attitudes on IPE at COHES, JKUAT was tested using Pearson correlation. There was no statistically significant evidence to reject the null hypothesis ($r=0.184$; $P=0.125$). Basing on these findings therefore, the Null hypothesis was upheld.

Table 4.9: Relationship between Knowledge and attitude

Correlations		Attitude score	Knowledge Score
Attitude score	Pearson Correlation	1	0.184
	Sig. (2-tailed)		0.125
	N	71	71
Knowledge Score	Pearson Correlation	0.184	1
	Sig. (2-tailed)	0.125	
	N	71	71

4.6 Relationship between Demographic Characteristics and Attitude

Using binary logistic regression, the respondent's gender, age, years of experience in the profession, years of experience in teaching, school of affiliation, academic position did not significantly influence their attitude towards IPE. (See table 11).

Though not significance, ($p=0.061$), faculty's classified as novices in IPE on expertise level were 5.3 times more likely to have positive IPE attitude than those who were not familiar with IPE (OR 5.3; 95% CI 0.923-30.644).

There was a statistically significant association between applying IPE and faculty's attitude ($P= 0.036$). Faculty who applied IPE at the college of health sciences were 3.8 times more likely to have positive attitudes towards IPE than those who didn't (OR 3.8; 95% CI 1.093-13.24).

There was a statistically significant association between supporting students from different profession and attitude ($P= 0.021$). Respondents who supported different professions learning together were 2.3 times more likely to have a positive attitude as compared to those who didn't support (OR 2.276; 95% CI 1.733 to 2.989). See table 4.10.

Table 4.10: Relationship between demographic characteristics and faculty's attitude

Variables		Attitude		B	Sig.	COR	95% C.I. for EXP(B)	
		+VE	-VE				Lower	Upper
Gender	Female	17	13	-0.317	0.512	0.728	0.283	1.877
	Male	20	21	Ref				
Age group	25 - 34	6	5	-21.385	1	0	0	.
	35 - 44	23	14	-21.699	1	0	0	.
	45 - 54	8	14	-20.643	1	0	0	.
	55 - 64	0	1	Ref				
Academic position	Graduate assistant	2	0	-21.203	0.998			
	TF/ Ass. Lecturer	11	10	-0.095	0.999	0	0	.
	Lecturer	16	17	0.061	0.949	0.909	0.05	16.54
	Senior Lecturer	7	6	-0.154	0.967	1.063	0.061	18.454
	Associate Professor	1	1	Ref.				
School of affiliation	Public health	5	5	0	1	1	0.132	7.57
	Medicine	19	13	-0.379	0.671	0.684	0.119	3.933
	Nursing	7	6	-0.154	0.876	0.857	0.124	5.944
	BioMed Sciences	3	7	0.847	0.428	2.333	0.287	18.965
	Pharmacy	3	3	Ref				
Years as health profession	10-19	24	14	0.693	0.661	2	0.90	44.35
	20-29	9	13	-0.539	0.711	0.583	0.34	10.07
	30-39	1	1	0.369	0.804	1.44	0.8	26.23
	0-9	3	6	Ref				
Years in Teaching	11-20	3	3	21.14	1	1.5x10 ⁹	60	-
	21-30	1	0	21.203	1	1.6x10 ⁹	00	-
	1-10	33	31	Ref				
Current expertise in IPE	Novice	27	15	1.674	0.061	5.333	0.928	30.644
	Experienced	5	3	-0.077	0.923	0.926	0.194	4.425
	Not Familiar	5	16	Ref				
Application of IPE	No	23	25	22.456	0.999	5.65x10 ⁹	0	.
	Yes	14	4	1.336	0.036	3.804	1.093	13.241
	N/A	0	5	Ref				
Supporting IPE	No	0	5	5.83	0.021	2.3	1.73	2.99
	Yes	37	29	Ref				

4.7 Perceptions of Faculty and Students on IPE

The researcher pursued what faculty and students considered to be the benefits of incorporating IPE into training, what they considered as barriers to IPE uptake and what could be done to circumvent these barriers. This was done through FGDs and KIIs.

4.7.1 Perceived benefits to IPE among Faculty and Students

The quantitative arm pursued reasons for supporting IPE using an open-ended question. When analyzed, they emerged as benefits of IPE while reasons for not supporting as hinderances. To get a clearer understanding, the researcher further explored perceived benefits and perceived hinderances to IPE using FGD and KII among faculty, students, and educational leaders at the college. The researcher checked through all the nodes as generated using NVIVO software and grouped them as parent and child nodes. Parent nodes were categorized as main themes in this presentation and child nodes as subthemes. Five main themes with several subthemes on perceived benefits emerged as summarized in table 4.11.

Table 4.11: Perceived Benefits of IPE among faculty and students (Qualitative)

Theme	Subthemes	Illustrative quote
Fosters Teamwork	Development of strong teams and team spirit Improved decision making Avoids Segregation of HCWs in practice Collaborative Practice	<i>“We are able to inculcate to our students that spirit of IPE we will have a student population who now graduate and want to work as a team” KII 3</i>
Improved Quality of training and care	Improves quality of training Encourages cross pollination among professions Encourages task shifting Shared Knowledge and skills transfer Promotes evidence-based practice Improves on quality of care	<i>“MOH has been emphasizing on task shifting to bridge the wide gap on human resource. Though it hasn’t kicked off and professions are not keen on it I think IPE would encourage this” (FGD 1, F).</i>
Improves interpersonal relations	Break professional cocoons/Silos and hierarchies Fosters friendships/Social interactions/Networking Brings faculty and students together Encourages harmonious coexistence at work Boosts respect among faculty and students	<i>“We are human really and when our relations are good in school as students the same relations will be good at work, we won’t have this notion of this a doctor, and I am this that. And who knows we will marry amongst ourselves. Ooh yes. Why not?” (FGD 3, S)”</i>
There is better resource utilization	Avoids duplication of roles and duties Reduce conflict for shared resources Cost effectiveness Rational use of human resource	<i>“Am looking at a scenario where faculty can teach a course like research across the college together. That will be cost effective, and everybody will benefit from the expertise of that lecturer”(FGD3, F)</i>
Boosts Communication	Foster’s role clarification and communication	<i>“There are improved communication skills so there will be better collaborative teams in the work we do with better communication skills if we have engaged in this learning together” (FGD F, 3</i>
Others	Curbs conflicts Helps various professional grow leadership traits	<i>“It will help us see each other as partners and not as rivals” KII 3</i>

Theme 1: Fosters Teamwork.

Respondents felt IPE helps in developing strong teams, brings HCWs together and encouraging collaborative practice. The students felt teams fosters better decision making. Some respondents said: -

‘When IPE is taught to enhance teamwork, I see no delay in implementation of care among patients just because no member in the hospital will wait for another one to come do a procedure that, as a member of the team, they could perform’. FGD 1 (F)

Theme 2: Improved Quality of Care and Training.

Faculty and students felt learning together will not only improve the quality of students’ training but the same will be reflected in practice that will bring out improved quality of care. Faculty further felt it encourages cross pollination and task shifting. From the students FGDs besides the common subthemes from improved quality of care and training theme, shared decision making, and knowledge and skills transfer among student’s subtheme also emerged

A few sampled responses include: -

“Cross pollination is a very important thing. If you inbreed too much, you can only experience what a nurse has experienced in life. And life is not about a nurse, the health realm is much more than being a nurse, is much more than being a public health expert, is much more than being a doctor” (KII 4)

“MOH has been emphasizing on task shifting to bridge the wide gap on human resource. Though it hasn’t kicked off and professions are not keen on it I think IPE would encourage this” FGD(F) 1.

“There is something a nursing student knows better than a medicine student or pharmacy like abdominal palpation, doing Vaginal examination and delivery etc. so

when we are learning together then we are likely to transfer knowledge and skills amongst ourselves” FGD 1(S)

Theme 3: Improves Interpersonal Relations

Interactions that students foster during training across professions grow into lifelong friendships and networks. It also helps in breaking professional rings that tend to form around themselves and boosts respect for each other. Faculty reported it fosters good work relations that translate to social support systems.

“There would be improved working relations if we were able to work together as faculty, we would probably go far but people are busy pretending in their silos, I don’t think that will take us anywhere, but if we are able to mix then we will know what strengths people have” (FGD 2(F)

“We need to work together. If you graduate as a nurse and another as a doctor, well, you have graduated. If these two are posted to the same hospital and they don’t know each other then we would have failed as teachers” (KII 2).

“The professional cocoons that we tend to fence our professions in, somehow are broken down when you are having inter-professional training and I believe it was very beneficial to a number of us, some of the colleagues that we relate with freely is because of that training that we had together” (FGD 3(F).

“We are human really and when our relations are good in school as students the same relations will be good at work, we won’t have this notion of this is a doctor, and I am this that. And who knows we will marry amongst ourselves. Ooh yes. Why not?” (FGD 3 (S)

“I think when we work together, we respect each other especially in the hospital set up” (FGD 4 S).

Theme 4: Better Utilization of Resources

When we learn together, we avoid duplication of tasks and there is better utilization of human resources, and leading to cost effectiveness in training. There is maximization and rationalization on the use of faculty. Some respondents reported: -

“Am looking at a scenario where faculty can teach a course like research across the college together. That will be cost effective, and everybody will benefit from the expertise of that lecturer” FGD (F) 3

Theme 5: Boosts Communication

Communication is one of the domains of IPE. It also emerged from this research.

“There are improved communication skills so there will be better collaborative teams in the work we do with better communication skills if we have engaged in this learning together” FGD (F) 3

When compared to what respondents cited in the quantitative arm, teamwork, resource utilization and quality of training were common across the two arms with deeper enquiry from the qualitative arm. There was concurrence between the qualitative data from the faculty and the students.

4.7.2 Perceived Hindrances to IPE among Faculty and Students

Further, from the discussions from faculty and students and interviews from educational leaders, several perceived hindrances to IPE were identified. Five main themes emerged with several subthemes as summarized in table 4.12

Table 4.12: Perceived hindrances to IPE adoption among faculty and students

Theme	Sub theme	Codes	Illustrative Quote
Curricula Challenges	Curricula structure	Semester vs Trimester vs End of year	“The other challenge that I think is also a major one is the ownership of curriculum by various departments and unit system.....” FGD 3(F)
		Unit System	
		Curricula rigidity	
	Program timelines	Tight schedules/Timelines	“...the biggest challenge would be to synchronize the learning and levels of students can be paired with their counterparts and what is common to them is taught in an integrated manner” (FGD 2 (F))”.
		Differing programme durations	
	Curricula implementation	Loaded Curricula content	“You know the training has been taken away from our hands to a large extent, into the hands of the professional regulatory bodies. Rigidity of the curriculum has been handed down to us by the regulatory bodies” (KII 2).
Differing depths			
Professions Regulation	Different regulatory bodies Varied scope of practice		
Professional socialization challenges	Negative perceptions towards other professions	Professional cocoons /silos	“A lot of times the teams in health, work like in silos.....” (KII 4).
		Stereo typing	
	Professional identity	Negative attitudes about each other amongst students Superiority /inferiority complex Sense of competition among professions	“Students have attitudes towards other students..... These are mostly borrowed from our practicing peers and the superiority complexities that exist” FGD 3 (S).
Constrained resources	Lack of adequate infrastructure	Classrooms and labs aren’t enough	“We have limited infrastructure- we are already struggling with the available. Reorganizing our infrastructure and seeing what is being duplicated and agreeing to work across schools would help” (KII 5).
		No IPE structures in place	
		No budget for shared resources	
Human resource shortages	Inadequate Faculty No faculty trained on IPE		
Others	Large Classes	Large classes	“Lack of clear framework in which to incorporate IPE activities where we don’t know where we should start the kind of modules or units, we should do together can be a challenge” FGD 4 (S).
	No framework at the school for IPE	Framework lack	

Theme 1: Curricula Challenges

Often regulatory bodies push down syllabi that dictate curricula among various professions which is often heavy, and this brings rigidity. The departments in the college

have differing structures and timelines with some running a semester system and others a trimester basis. Though some content cut across all schools the scope and depth differ. Further, the unit system is seen as a hinderance as it brings about curriculum ownership by schools. The college of health sciences trains various professions who have different independent regulatory bodies and often they dictate syllabi and making curricula adjustments sometimes difficult. It has also been felt that IPE sometimes is hindered by our regulatory bodies who prescribe scope of practice

. A few respondents had this to say:-

“I think for us, the biggest challenge would be to synchronize the learning so that various levels of students, the appropriate level of students can be paired with their counterparts and what is common to them is taught in an integrated manner” (FGD 2 (F)).

” The other challenge that I think is also a major one is the ownership of curriculum by various departments and unit system therefore if we have got a physiology in public health and we have a physiology in pharmacy, the physiology in our place is ours. Because the structure in JKUAT is that every department has got a program and we take our workload from the department” (FGD 3 (F)).

“Different programs have different term dates. Like you will find a program they are having semesters another program is having trimesters, like I was teaching epidemiology to two groups, so one I was told the exam comes at the end of trimester, the other one was coming at the end of the semester. So, on dates, there is need to have some uniformity for the college if we were to have this inter-professional program going on” (FGD 3 (F)).

“Following the way timetables are drafted, you find it is not possible to have classes at the same time, our timetables are packed from 7 to 5 pm, Monday to Friday so possibility of having a session together is not possible” FGD 3(S).

“The scope of practice of different professions presents a barrier” FGD 1 (F).

“You know the training has been taken away from our hands to a large extent, into the hands of the professional regulatory bodies. Rigidity of the curriculum has been handed down to us by the regulatory bodies” (KII 2).

Theme 2: Professional Socialization Challenges

Professions have over the years trained unprofessionally and as such they formed rings around themselves that are sometimes psychological or physical. These have led to stereo typing among professions bringing about negative perceptions and sense of competitiveness with some feeling superior to the others. Professions have been socialized differently and this make them develop their own identities that could influence how they relate with others. A few responses from the faculty and students are sampled below: -

“A lot of times the teams in health, work like in silos, people working in their own domains. One I think is the way we are trained, it’s the structure, is how we have been socialized in the school, and how we have perceived our professional training (KII 4).

“I think the problem would be probably the attitude that people have towards other professions especially just attitude towards work and other approaches” (FGD 3 (F)

“Students have attitudes towards other students that limit their interaction and at times felt like some students from some schools are favored. These are mostly borrowed from what we find amongst our practicing peers and the superiority complexities that exist” FGD 3 (S).

Theme 3: Constrained Resources

Our resources both human and physical infrastructure are limited. Our programmes are very congested hence time to bring in IPE could be seen as a challenge.

According to the participants: - *“We have limited infrastructure- we are already struggling with the available. Reorganizing our infrastructure and seeing what is being duplicated and agreeing to work across schools would help” (KII 5).*

“We don’t have enough faculty to guide IPE. If we go IPE tutorial groups way, we need more faculty” FGD 3 (F).

Theme 4: Professional Regulation Differences

“The scope of practice of different professions presents a barrier” (FGD 1 (F)).

Theme 5: Others

Students felt we lacked a clear framework on IPE. Faculty felt we have no IPE guidelines, our classes are large too so when we combine students across the college the numbers could be unmanageable.

“Lack of clear framework in which to incorporate IPE activities where we don’t know where we should start the kind of modules or units, we should do together can be a challenge” FGD 4 (S).

“Am seeing a scenario where you have a very larger class of let’s say research. However, if we went the tutorial groups way then that could be manageable.” FGD 3(F)

4.7.3 Suggested Solutions to Reported Hindrances to IPE

We pursued how the hinderances could be overcame and further use them as strategies for IPE integration. The Solutions to the suggested challenges included: -

- IPE sensitization among faculty and students
- Identifying of IPE champions from every school
- Behavior change training to revert the negative attitudes

- Having an online IPE programme that will circumvent the challenge of time and conflicting schedules
- Forming IPE tutorial groups across the college and curricula scrutiny and synchronization.
- Having a common room for faculty at the college
- Having intentional forums at the college that incorporate IPE like journal clubs, joint sporting events and students’ associations would bring schools together.
- As a long-term solution having an IPE framework, a common college budget for IPE and having a center to coordinate IPE activities was seen as a solution.

These are summarized in table 4.13.

Table 4.13: Suggested solutions to challenges

Hindrance	Suggested Solutions to hindrances	Illustrative Quotes
Curricula Challenges	Online IPE programme Synchronize IPE initiatives Curriculum alignment College IPE technical committee Sensitization training on IPE Develop an IPE framework	<i>“I think sensitization training and a way of monitoring especially attitudes also, because a lot of us have not had adequate even experience in our own trainings on how to integrate training across carders so even our attitudes may also require some adjustment” FGD 2(F).</i>
Professional related challenges	Behaviour change education Intentional informal forums Journal clubs IPE common room IPE champions among faculty Interschool Sporting events	<i>“I think interschool sports that could be organized by an umbrella association body of all students at the college would be exciting. After the match on the side-lines, we can bring the agenda of IPE and by embracing it informally I believe when introduced in curricula it will be accepted” FGD 2(S).</i>
Constrained resources	Have a common IPE budget at the college Rationalize staff IPE Centre to coordinate IPE activities	<i>“Where IPE is established and is working, they have established IPE centre that coordinate all IPE activities” KII 2.</i>

Some respondents had this to say: -

“You know, one of the things that I thought JKUAT could work for, and it would bring our students in the college of health sciences together, and I’m seeing it being practiced in the first world, medical training centers some actually call them IPE centers” KII 3.

“I think the 1st thing that we should do is an awakening that help us recognize the value and importance of IPE and move away from lip service where leaders and educators go beyond talking to implementing structures that support it” FGD 4 (S).

“I think for us, the biggest challenge and solution would be how to synchronize the learning so that the appropriate level of students can be paired with their counterparts in other schools. The teaching timetables and clinical schedules if we go IPE both way” FGD 2(F).

“Universities had common rooms and common rooms were places where training staff would meet. If you don’t have a class, you can go there for tea, you can go there for coffee, you can go there for a drink, and then they can also have their meetings occasionally. One at the college would bring us together” KII 4.

The perceived hindrances highlighted from the quantitative arm of the study were similar to those from the qualitative arm from the faculty and students with addition of a few subthemes, deeper enquiry and understanding. In addition, students brought out lack of IPE framework as a hinderance.

4.8 Content areas for IPE

4.8.1 Content Areas (Quantitative)

In phase one of the study respondents were asked which content areas could be included into Interprofessional education using a multiple response question. Basic sciences were indicated by 25(23%), research and communication skills 13(12%) each, nursing skills

by 12 (11%), Community health 11(10%), medical ethics 10(10%) among others as summarized in Table 4.14.

Table 4.14: Content areas for IPE(Quantitative)

No	Content area	No	%
1.	Basic sciences and pharmacology	25	23
2.	Research Skills	13	12
3.	Communication Skills, professionalism and roles and responsibilities	13	12
4.	Nursing Skills	12	11
5.	Community Health/Public Health	11	10
6.	Medical Ethics	10	10
7.	First aid/emergency medicine	4	4
8.	Behavioural Sciences	3	3
9.	Health system Management	3	3
10.	Entrepreneurship	3	3
11.	HIV	2	2
12.	Clinical placements	8	8
Total		105	100

4.8.2 Content Areas from Qualitative arm

In the qualitative arm of the study, the researcher explored further on the content areas for IPE as raised from the quantitative arm with the arm of agreeing what areas that would boost IPE if taken up. Several themes emerged as summarized in Table 4.15.

Table 4.15: Content areas for IPE (Qualitative)

No	Content area (Theme)	Descriptive text
1.	Basic sciences (With same depth and scope)	<i>“All the health professionals have some aspect of basic sciences. Say Anatomy and physiology, biochemistry, and microbiology. While the depth may differ, there are those professions that really have more than 70% of the content similar, these can learn together as a start point even as we introduce other things in what we are calling interprofessional education. On the flip slip of this though curricula alignment needs to happen first because you will find what is similar is done different times across schools” FGD 2(F)</i>
2.	An Introductory IPE course	<i>“IPE is a concept that isn’t well understood by all. Having a common course that introduces IPE competences from let’s say CAIPE will help learners understand and even engage better in commonly taught units or even when they go to the clinical areas” FGD 3(F)</i> <i>“In occupational therapy we have a course called interprofessional education and I see we only do it alone. It’s a course I feel would benefit all students at the college” FGD 4(S)</i>
3.	Research to include biostatistics and epidemiology	<i>“We can add issues like research methodology, things like epidemiology and issues to do with medical biostatistics because the outline and the content is the same. So, we can have it done inter-professionally FGD 1 (F)</i> <i>Interprofessional research projects like what we do with HEPI can be adopted KII 6</i>
4.	Communication skills	<i>‘There are units we did like communication skills, nursing skills that in retrospect I feel they would have been more intriguing if we did them through IPE as almost all students at the college, I believe do them” FGD 1(S).</i>
5.	Nursing skills	<i>“We did a course called nursing skills, but we were only medicine students. When we met in the wards nursing students are so good in those skills, I will admit I didn’t take the course seriously, but I think it would have been beneficial if we were combined</i>

			<i>because those skills are so key in practice” FGD 3(S).</i>
6.	First aid to include BLS and ATLS		<i>“We were introduced to BLS in the school of pharmacy, but the course didn’t have practical. If we did it let’s say with nursing students who do the practical components we would have learnt more” (FGD 3 (S)).</i>
7.	Community Courses	Health	<i>“I will tell you my desire was to initiate a COBES programme when I joined this university. Students embrace teams early in training in COBES. This however didn’t happen. I hope it will one day” KII 2</i>
8.	Health management economics, HMIS)	Systems (Health	<i>“Health Economics is key. Of course, this is a wide area, but we can see what to adopt” FGD 2(F).</i>
9.	OTHERS – Clinical Medical Ethics	HIV, 1 st placement,	<i>“HIV, things like medical ethics among others could apply for IPE” FGD 3(F).</i>

Theme 1: Basic Sciences

Faculty from both FGD and KII felt that learning basic sciences together among professions with same depth and scope was seen as a good starting point. Students further added when the practical component from the basic sciences are done in an interprofessional manner, the students also learn better and grows social skills besides knowledge and skills. A few respondents had this to say: -

“I think most of us students do basic sciences. However, some do lab and skills sessions, and others don’t. If we learnt that practical together, I think we will understand each other better and have knowledge and skills exchange” (FGD 4 (S)).

Theme 2: An introductory course to IPE

The concept of IPE is not well understood. It has been often misunderstood for shared learning. Introducing a course that equips the learners to IPE core competences of Values and Ethics, Communication, Roles and responsibilities and teamwork will help them be able to engage better even as they learn other content areas common to them. It will improve their engagements in the clinical areas as they share clinical space. The

core competences will be incorporated in the sensitization training of faculty before commencement of IPE at the College. Some respondents had this to say: -

“IPE is a concept that isn’t well understood by all. Having a common course that introduces IPE competences from let’s say CAIPE will help learners understand and even engage better in commonly taught units or even when they go to the clinical areas” FGD 3(F)

“In occupational therapy we have a course called interprofessional education and I see we only do it alone. It’s a course I feel would benefit all students at the college” FGD 4(S)

Theme 3: Research courses

Research was brought forth from the discussions as an area to pursue IPE. It is a course requirement to all programmes at the college to do research. There are also related courses like statistics and epidemiology. These students do research projects but unprofessionally. It is already happening though as an add on to curricula through the HEPI grant. The theory courses could be taught together, and students grouped in interprofessional groups for joint research projects. Some respondents said: -

“Also, other courses that you may find cutting across are like the one’s which involve research methods, medical research methods, there is also statistics so these are courses epidemiology which can also be considered and actually that can bring this interprofessional interaction during their training” FGD 3(F).

“ My experience now is we have a grant that we are implementing with University of Nairobi, Kenyatta University, Jomo Kenyatta University and Maseno and what we are doing is basically in research in undergraduates, so what we do is we engage inter-professional groups of nursing, pharmacy and medicine where we identify research areas that they can work together and come up with solutions” KII 6.

“The idea of research projects would expose students to IPE where they undertake together. Am a beneficial of a short course on research under HEPI and I learnt so much on conduct of research and we even did interprofessional research and got to know students in other schools” FGD 2 (S).

Theme 4: Communication Skills

Health care workers need communication skills in the delivery of care. When it is taught together, it will help not only clarifying roles and responsibilities for various professions it will also bring about teamwork and respect among HCWs. A few respondents had the following to say: -

“Take a course like communication skills for example. It is offered as a university common course but is it adequate for health? I would propose one tailored to the college that will even incorporate learning and understanding the concept of IPE” (K11 2).

Theme 5: Nursing Skills

It was evident from the discussions that all professions at the college require some aspect of nursing skills though referred by different terms in their respective Curricula. Some respondents had this to say: -

“There is a whole unit called basic life support. So actually, now as we are reviewing the new curriculum, we have beefed up now by adding nursing skills” KII 1.

“Nursing skills, of course under nursing we call it fundamentals of nursing with many other aspects, I think there is a way we can look at what other programs are teaching under nursing procedures and be able to marry them together and teach them together, that is the students from nursing, from pharmacy, from medicine, clinical medicine, we teach those nursing procedures together” FGD 3(F).

Theme 6: First aid, BLS and ATLS

Respondents felt we all needed first aid skills. While some school already have it in their curricula, others don't. Introducing it across the schools in the college and having it taught through IPE approach would be a gain. *A few sampled responses from the respondents are: -*

“We have the basic life support courses, like BLS, advanced ACLS, first aid, because these are things that cut across and usually the examining, be it the theory and the practical, is the same. This one cuts across all the professions” FGD 1(F).

“Some IPE is already happening through research, we can beef this one first to include all students then we can now go to other aspects like communication, basic life support but I think it is something that should be gradual” FGD 2(F).

Theme 7: Community Health

All professions in health have a community health component. Coming to a middle ground on what can be taught across the college is key. Respondents mentioned COBES has worked elsewhere in this country, and it is something the college can consider adopting. A few respondents had this to say:

“And another place where I have been thinking about where this actually makes a lot of sense is, the course on community health because all the various professional cadres have some role to play in the community so there is what the nurses have to do with the community or how they interact with the community, the medical officers, the clinical officers, even the laboratory staff with the community” FGD 2 (S).

“When the school of medicine trains their students on community health issues, which means community diagnosis is part of that. They allow that the school of public health go through that. And that's why we organize their programs for anything community

health, any epidemiology, we do their statistics, I believe other schools come on board too and school of public health can also see what to learn together in the other schools” KII 4.

Theme 7: Health systems Package

By the nature of our training, graduate HCWs get into the health care work force as middle level managers. Health system management package, health politics, health economics and health policy were mentioned as areas of common interest. This is what some respondents had to say: -

“...So, in one week we set the medical students aside and we take them through health information management system, HIS issues, within one week and last week we had a visit by the Kenya Medical Practitioners and Dentists council to the same lab and one of the things they have picked including the chair of that council is the fact that they want other medical schools in Kenya to adopt this. I believe other schools in the college would benefit from this too” KII 4.

Theme 8: Others

Other content areas mentioned by students and faculty from the focused group discussions is HIV and medical Ethics. One respondent had this to say: -

“HIV, things like medical ethics among others could apply for IPE” FGD 3(F).

4.8.3 Faculty Preparedness (KAP) to Facilitate IPE

The researcher was concerned in knowing if students felt their lecturers were prepared to facilitate IPE as they understood it while faculty were asked if they were prepared to facilitate IPE in the FGDs and key informants asked if they thought faculty members from their school were prepared to facilitate IPE. While the general view is they were prepared, there was agreement that sensitization would be needed to bring everybody on

board and clear out any gaps that would be identified. The attitudes of faculty towards each other were a hindrance and needed to be addressed. Workshops and seminars having an IPE structure and guidelines were suggested as a way of bridging the gaps.

There were no policies at the College that were against IPE and both FGDs and KIIs agreed that administration would support IPE should it be introduced in training.

Faculty from the FGDs had the following to say: -

“The administration will always make decisions based on the policies that are existing. If there are not conflicting, then it will not be a problem to support. But generally, if the policies are agreeable, then I don’t think they’ll be a problem in implementing it” (FGD 1 (F)).

“In terms of coordination, there are guidelines to be followed, so that will be easy. In terms of content delivery, in my area of expertise I’ll do it the following” (FGD 3(F)).

“I think the problem would be probably the attitude that people have towards especially just generally attitude towards work, some lecturers tend to have some negative attitude even towards other professions. Complains have come in departments that have attempted shared learning in say Physiology in the school of medicine and school of pharmacy of discrimination. My students for pharmacy didn’t like it, they felt as if they were being treated as second class students. They would ask Why is the link being shared through class reps of medicine then they share to us? Why doesn’t the lecturer share directly?” (FGD 3(F)).

“In terms of attitude I can tell you we are not ready. Because we are still trying to fragment ourselves. And I don’t know why, maybe it’s because the more you split your programs, the more you attract more students” (FGD 2(F)).

Key informants indicated University management would support IPE. They however just like faculty indicated there would be need for sensitization training. A few had this to say: -

“I think overall, the university management has in my view has gone out of its way to support us as a college, anything we have requested they actually handled them very generously and have no complains about that” (KII 2).

“I am sure they will support, but the most important thing is that the idea is sold to them for them to buy in” (KII 3).

“I think they can support. Only those resources are scarce, but I think if they are well sensitized, and if it’s supported from the college faculty members, the principal, and the deans, I think it should be able to go through. And I am looking at it in terms of its not too many resources. It is something that is basically organization, organizing people and trying to synchronize the timetables and the other things” (KII 4).

“Preparedness is very low. You know IPE here when you talk of preparedness we must be prepared in terms of attitude, in terms of training, in terms of facility and in terms of even the structure. Because what kind of structure do we have?” (KII 3).

“Yes, it’s a question of attitude, maybe how the lecturer approaches the issue of training these students, but it cannot also be lost on this fact that the students also experience peer influence” (KII3).

Students felt IPE would be beneficial though some weren’t sure faculty were fully prepared. Two respondents said.

“I may be speculating but am not really sure if we have already trained personnel to deliver IPE to us”. FGD 4(S).

“I believe interfaculty teaching is very beneficial. We interact with students from other schools while at it. For example, when we were doing anesthesia and went to ICU, its faculty from nursing who were teaching us, and it made it easier for us to understand”
FGD 2(S).

4.8.4 Data Triangulation on Content areas for IPE

Comparing the content areas suggested from the quantitative and qualitative arm of the study and considering consensus building in FGD 3 among faculty and FGD 4 among students, and by both faculty and students, key content areas emerge. These are basic sciences with same depth and content, research package to include research methods epidemiology and biostatistics, communication skills, nursing skills, community health, health systems management and first aid. A new area emerged from the qualitative arm that the researcher considered a key content area. This was a common introductory IPE course to equip learners with IPE competences.

Delivering these content areas in a manner that will not only enable them to learn together but also about and from each other is encouraged. An incremental approach to introduce IPE where shared learning is implemented first as structures to support IPE and curricula review is done was brought forth. Clinical learning came out strongly from both arms of the study as an avenue where IPE could be practiced as students share common clinical practice sites.

On faculty preparedness to deliver IPE, from the qualitative arm respondents felt preparedness to IPE in terms of attitude was wanting and there would be need for sensitization training before commencement. This finding is in concurrence with the findings from the quantitative arm, where, attitude subscale 3 on attitudes towards IPE in academic settings yielded negative attitude score. Respondents didn't like teaching students from other departments, they didn't like teaching with faculty from other departments, they felt their students didn't like being taught by faculty from other departments and they didn't like learning with students from other departments

4.9 Modalities for Delivering IPE

Four areas were pursued under IPE modalities. These include when to initiate IPE, whether IPE should be examinable or just good to know content, the preferred delivery approach to IPE and if it should be embedded or run parallel to curricula.

4.9.1 When to Initiate IPE in Training

Participants were asked when they thought was the right time to introduce IPE initiatives. Three themes emerged to include early inception, senior years in training and following IPE all through training. Participants in the FGDs and KII had varied opinions with majority saying early as it would help inculcate an IPE culture before students develop professional stereotypes and a few saying later to allow individual professions to form their identities first. A consensus was reached in that early initiation of IPE that was followed throughout the training period would be more beneficial. FGDs from the students yielded similar thoughts with greater emphasis on starting IPE pre- clinical years and as they graduate to foster teamwork. The themes and accompanying descriptive texts are summarized in table 4.16.

Table 4.16: When to Initiate IPE

No.	Them	Descriptive Text
1.	Early Training in	<p><i>“At inception level, they can start together. At least that way, they will know that they have commonalities” FGD 2 (F).</i></p> <p><i>“Introducing it in the formative years will be helpful in inculcating an IPE culture” (KII 5).</i></p>
2.	Senior years in training	<p><i>“Probably in the senior years, third, fourth year, fifth, sixth year for medical students then a form of inter-professional training may be useful” (FGD 1 (F)).</i></p> <p><i>“It should be introduced probably towards the end once the students have grasped the subject matter in their areas of specialization whether it is nursing or medicine, then towards the end they should be able to come together and one of the things that we’ve done in the school of medicine we’ve actually applied this through some grand rounds that have been done” (FGD 3(F)).</i></p>
3.	Early and followed throughout training	<p><i>“I am beginning to see that when we put students in their very formative years of training together, it is what seems to be coming out is that it is easier to give them shared content, so they have shared learning, but they are not learning much about each other. All the students are not experts, they do not understand their fields and so they are all in the process of learning about this shared content and therefore following IPE throughout training would see to it that aspects of learning about and from each other are achieved” (FGD 3 (F)).</i></p> <p><i>I still think interprofessional education should run all through the whole curriculum. At inception we hardly know what our professions entails as we grow together, we will be able to differentiate yet remain together and as we go for clinicals it is strengthened further (FGD 4 (S)).</i></p>

More excerpts from the discussions are sampled as follows: -

“I would say at the introductory level, it would be better, because when you let them learn separately, it will bring that challenge we were talking about of cocoons” FGD 1 (F).

“We can start the inter-professional training at the pre-clinical sciences that is the year one’s and the year two’s whereby with that then the students are able to understand the various aspects in the different courses and they also are able to build up teams in the pre-clinical years” FGD 2 (F).

“I think early enough. You see like for example our students, our first years they mainly study physiology and I think anatomy with the medical students. So that introduction, that early introduction, would be beneficial rather than now bringing them together only to develop a research proposal” (KII 1).

“Early. So that aspect of training that needs to change from initial aspects of training are incorporated and followed through” (KII 6).

“Early is very key. When the students are fresh, and they are ready to talk to each. Very critical that they also come together as they are exiting. But followed all through training. Like we have this unit of entrepreneurship skills that is done by students who are finishing, before they leave, that would be a very good forum for students to start talking to each other. Maybe we could have another COBES for the college of health sciences that the students can do” (KII 3).

“Mind you my experience in developing curricula in medical education is that if we don’t start early to inculcate in these various disciplines, the importance of working together then there is going to be disjointed communication and ability to understand the limitations of each one of the professionals” KII 2.

4.9.2 Enquiry into academic examination of IPE initiatives

Participants were asked whether IPE initiatives should be examinable or should just be good to know information during training. Two themes emerged- Formal evaluation and informal evaluation. From both the FGDs and KIIs it was agreed they needed to be examined or at the very least have some form of evaluation to show that the objectives of the initiatives were achieved. This is summarized in table 4.17.

Table 4.17: Enquiry into Evaluating IPE

NO.	Theme	Descriptive Text
1.	Formal Evaluation	<p><i>“If inter-professional training has been used to impact skills, then a method of assessment of learning has taken place is important so when inter-professional models for training are integrated to deliver skill then that definitely has to be assessed and even in the assessment the various professions should be able to explain their roles in that given scenario or roles of others in that given scenario” FGD 2 (F).</i></p> <p><i>“Students in most cases do not operate with the good to know, so I think to retain the focus and the seriousness of the idea, it should be examinable FGD 3(S).</i></p> <p><i>“I think to me, where the world is moving, it is moving into inter-professional education, and I think that it is something that needs to be examined, like a core unit, so that people need to know that they need to work together, to avoid that situation where the doctor always feels the boss” (KII 6).</i></p> <p><i>“Once something becomes optional of good to know the students won’t take it seriously even people wont attend classes so I think it should be examined” (FGD 3(S).</i></p>
2.	Informal Evaluation	<p><i>“Yes, in a situation where examining becomes very difficult, probably there could be other ways of showing that somebody participated. So, if you find it difficult to examine in either writing or oral, then you can design a tool which just says participated, done, fully participated, completed, task completed, so that at least that engages people, you know that people completed it. That can serve in place of an exam” (FGD 1(F).</i></p> <p><i>“I see IPE more of a trait than a course. It the trait is there it is there, no need for examination and not all students being trained will end up working in the health care system where you require health care workers to work together, so NO we should not examine” FGD 1(S).</i></p>

4.9.3 Preferred Mode

With 67(94.4%) citing they would prefer a blended mode for IPE in phase one, the researcher pursued this further in FGDs and KII. All FGDs and KII among faculty were

in favor of a blended mode. A combination of classroom, clinical and community learning was preferred. Faculty suggested incorporation of research into the modality selected. Use of technology to harness on opportunities with online IPE initiatives organized was also emphasized from the discussion especially in the absence of a structured IPE at the college as we work towards one. This would circumvent the challenge of learning venues and tight schedules.

Some respondents had this to say: -

“I support a blend, One, apart from putting theory to practice, there are other benefits, they can enhance even bonding together and teamwork, the spirit of collaboration”. FGD 1(F).

“Introducing a COBES model would be my suggestion. After all it has worked elsewhere in our setup. We will learn in class together, go to communities together, do joint projects and even clinical learning in those rural facilities is incorporated” FGD 3(F).

“Research, first they undergo a dynamic training on research, then they develop a proposal together, then we mentor them, they go to the field, collect data and present in inter-professional groups. And even in the same, they are supposed to attend ward rounds together, so they do it together, and after that have a discussion around patients together. So that one is inter-professional to me” KII 6.

“Even setting a week for common training, a five-day training, 8 hours for 5 days is 40 hours so you have done through a unit in one week. And we can take advantage of online platforms available. With commitment can we lack a week really? When you have that common interest, time is not a problem” (KII 4).

“Even as we pursue other modalities, an online approach to teach has worked also has worked in other areas. Like we have been saying how our timelines are tight, this would help us overcome this even as we plan to have it on curriculum “(FGD 4(S).

“The clinical areas act as a good avenue for us to interact. Say when we learn the concepts in class together in our preclinical areas when we get to the clinical areas it will be easy to implement IPE as we will be putting into practice what we learnt” (FGD 4 (S)).

4.9.4 Curricula integration of IPE initiatives

The researcher sought to know the views of faculty and students on embedding IPE into curricula or should it be an add on. Two themes Emerged- those that felt it should be embed in curriculum and those that felt should be a curriculum add on running parallel. Majority believed it should be embedded as it would make it be considered important, formal and time and resources would be put into it. However, a few were of the contrary opinion that it should be informal, optional, and treated as good to know things during training as summarized in table 4.18.

Table 4.18: Integrating IPE into Curricula

No.	Theme	Descriptive text
1.	Embed IPE in Curricula	<p><i>“When in the curricula its better, students will take it serious as they know it is a must and it will be in my transcript” FGD 2(F)</i></p> <p><i>“I have seen where IPE works like Moi University’s COBES it is in the curriculum and everybody takes it seriously” FGD 3 (F)</i></p> <p><i>“Our curricula as we speak aren’t synchronised. But should we consider having IPE then including it would not only make if formal but also help in acquiring resources and facilities towards its implementation” KII 3</i></p> <p><i>“The moment it is made optional or parallel students will imagine it is a by the way. But when in Curriculum and as a course they will take it seriously as it will be in their transcript FDG 4(S)”</i></p>
2.	Curriculum add-on	<p><i>“Research electives have happened in two years running now and it had minimal disruption to curricula. I would support IPE to run parallel to curricula and off course see how to bring more students from other schools on board” KII 1</i></p> <p><i>“Our programme is 6 years we hardly have breaks adding anything further to it would be overwhelming. Afterall, I see this IPE as something not all professionals will need as not all want to end up in clinical practice space” FGD 3(S).</i></p>

4.10 IPE Model development

The researcher used GDM with modified Delphi technique to develop and validate the model (Keeney et al., 2021). It was done using the four steps of GDM that the researcher grouped into two rounds, with round 1 being development of the proposed model and round 2 being validation and review of the model that culminated in the final model.

4.10.1 Proposed Model

Model development started with data collection that involved both phase one and two of this study. Phase 1 involved collection of data and analysis by the researcher using

questionnaires and attitude scales to establish the status of IPE knowledge and attitudes among faculty at JKUAT while phase 2 FGDs and KIIs for deeper enquiry and identify the content areas and preferred modalities for IPE. The summarized data and from reviewed literature with the guidance of the academic supervisors was used to develop the proposed model.

While many content areas were suggested, FGD 3 from faculty and FGD 4 from students was used to build consensus on the preferred content areas and modalities for the 5 schools across the college. Shared basic sciences with same depth and scope were proposed for early inception and as an entry point to IPE. An introductory IPE course early in training to equip the students with knowledge on IPE, its key competences would help them embrace it. This would help them know their roles and complementarity so that even as they undertake other units that are proposed to use the IPE approach, they will incorporate IPE concept. These include: - Research package (research methods, epidemiology, and statistics), nursing skills, communication skills, first aid/, Health systems management and common community health units. College was at liberty to choose what would suite to be incorporated in curricula first and build on to others as the integration is finally achieved.

Further, on the preferred modality a blend that incorporates theory and clinical learning was preferred with a form of evaluation of the initiatives and an early introduction of IPE in training agreed upon by both faculty, students, and educational administrators. Harnessing the use of technology to deliver IPE was also encouraged to overcome time and tight schedules barriers.

An incremental approach to instruction of IPE is suggested with immediate, middle term and long-term steps for adoption brought forward. Immediate include shared learning for what is already common is suggested as a start point. Sensitization of students to IPE by faculty using informal and formal forums, Identifying IPE champions in all schools would help rally for inclusivity of IPE in curricula. In the middle term, curricula harmonization, Curricula add on of IPE initiatives is suggested. These could be done

online or as a crash programme alongside regular curriculum, establishment of journal clubs to sustain IPE culture and incremental introduction of common agreed content into curricula. In the long term an IPE center that coordinates IPE activities at the college is proposed. The IPE center with facilities to advance IPE learning to include simulation labs, lecture rooms, social hall for students and a common room for faculty among other facilities

Administration buy-in of IPE integration into curricula at the college is key for its success. Upon buy in, Schools buy in into what would apply for all is proposed. Faculty and students who are the key stakeholders need to be looped in. Several approaches to bring them in are suggested in the model. Attitude change training and IPE sensitization among faculty as was identified in phase 1 of the study will be key for successful adoption of IPE.

This proposed model was then subjected to a panel of 7 Experts drawn from expertise across health professionals. See the proposed Model in figure 4.3

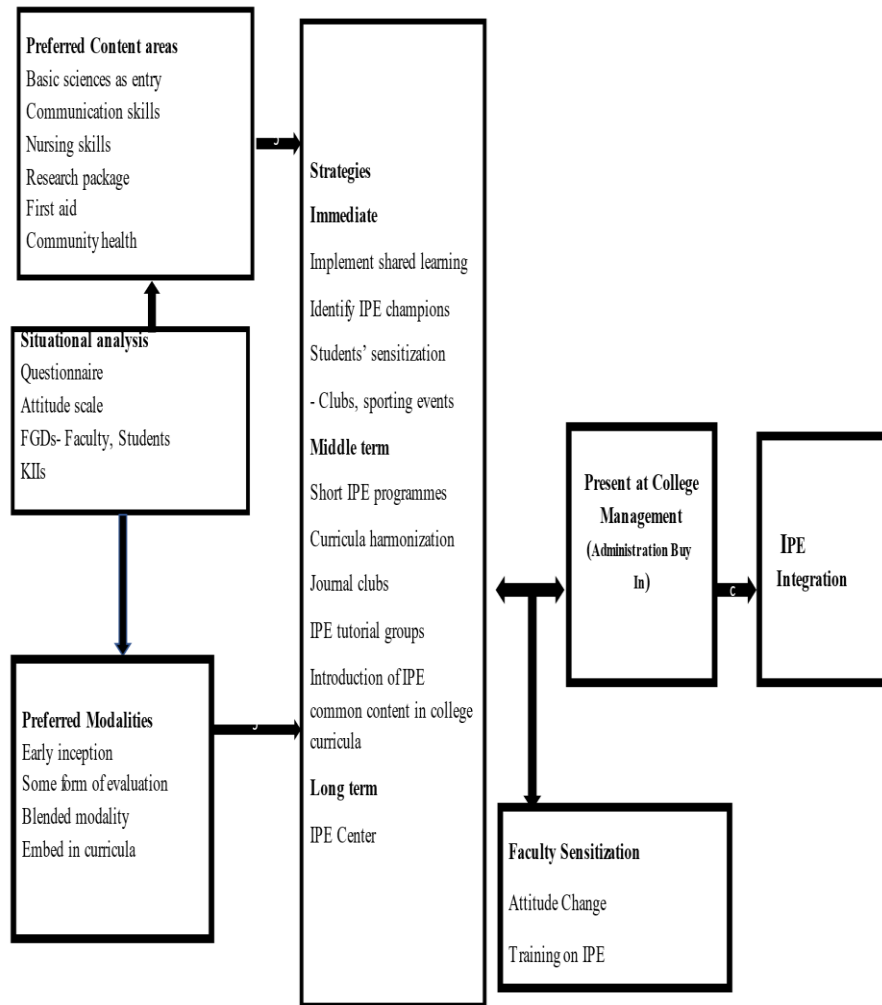


Figure 4.3: Proposed Model before Review

4.10.2 Model Validation process

In round two of model development the researcher embarked on proposed model validation. Model validation involved subjecting the proposed model to a panel of experts to review the model using a predetermined dichotomized checklist and one open question suggesting areas of improvement to the model using modified Delphi technique (Keeney et al., 2021).

Once the experts returned the check list to the researcher, she checked for consensus. This research considered reaching consensus if all the experts and each item in the check list scored more than > 70%(6 out of 8 statements) in the checklist as borrowed from a study by Keeney et al., 2021. In round one of review, four experts scored 100%, two experts scored 62.5% and one 87.5%. All statements reached threshold on round one of review except statement seven on stakeholders' involvement (See appendix 9) that scored 62.5%. The comments from the experts' review were incorporated and a revised model developed that was subjected to round 2 of review. In round 2 of review all experts reached the set threshold hence consensus.

Following expert review, the model was made prescriptive where a start point using shared learning, moving to introducing a common interprofessional course was suggested. This would then be followed through by teaching applied areas using IPE approach. Eventually having community health taught through COBES is suggested. Curricula scrutiny was recommended by the experts to be done by schools to identify their areas of commonality and agree on what could be borrowed from the identified common content areas before commencement. Stakeholders' involvement was improved in subsequent model and involvement of DAQA and Deans committee for approval of reviewed curricula at the university included. Upon incorporating all the suggested changes, the final model was developed. Table 4.19 summarizes the expert's bio-demographics, the scores, and their comments with Figure 4.4 showing the final model.

Table 4.19: Expert Validation Summary

Exp no.	Age	Expertise	Yrs. of Exp	R 1	R 2	Comments
Exp 1	41	Health Systems Management	16	100	100	Consider writing some of the abbreviations in full e.g., admin This is a great model that can be used not only in JKUAT but across all health/ medical training institutions
Exp 2	46	Public Health	13	100	100	More consultations with technical experts in health programmes curricula delivery and implementation is important.
Exp 3	56	Microbiology (Lab sciences)	21	100	100	Inclusion of research methods in the content is good. In addition, you can explore inter-professional research projects where students from various professions/courses team up to conduct their final year research projects. This will improve their understanding of handling health issues from an interdisciplinary approach hence, strengthening health systems.
Exp 4	43	Community Health	10	100	100	Is there a way of spelling out who the stake holders are for various steps of the model? This is in connection to question 7. Other than seeing college admin, Ipe Champions, students mentioned here and there, am not sure the model categorically show who are the stakeholders for what step.
Exp 5	42	Physiotherapy and IPE	10	62.5	100	No would have been partial if I had a third option. This is for example in item The stakeholders for IPE spill over to the community and other stakeholders that are non-clinical. It is not clear whether the curricula have been studied for synchrony of the common content. That speaks to the strategy. In the interest of item 8, article on Introducing Interprofessional Education by CAIPE would be useful. Implementation can borrow from outside your data since your data did not necessarily come from experts. This is the role that literature review can play in your study.
Exp 6	50	Leadership and Management	15	87.5	100	This is a very good project and can be replicated The involvement of students is not clear. What is their role in IPE? This should come out very clearly. I propose that may be could have also interviewed some people from the curriculum implementation department/administration in JKUAT to have their views also especially on modalities of implementation
Exp 7	45	Paediatric and Child Health	8	62.5	87.5	The model is clear and implementable. The model has left out students/student leaders as a group of interest in buy in. As per university regulations would it be possible to implement without involving senate/deans committee? - After College Board Level does the roll out end there. What about school management boards?

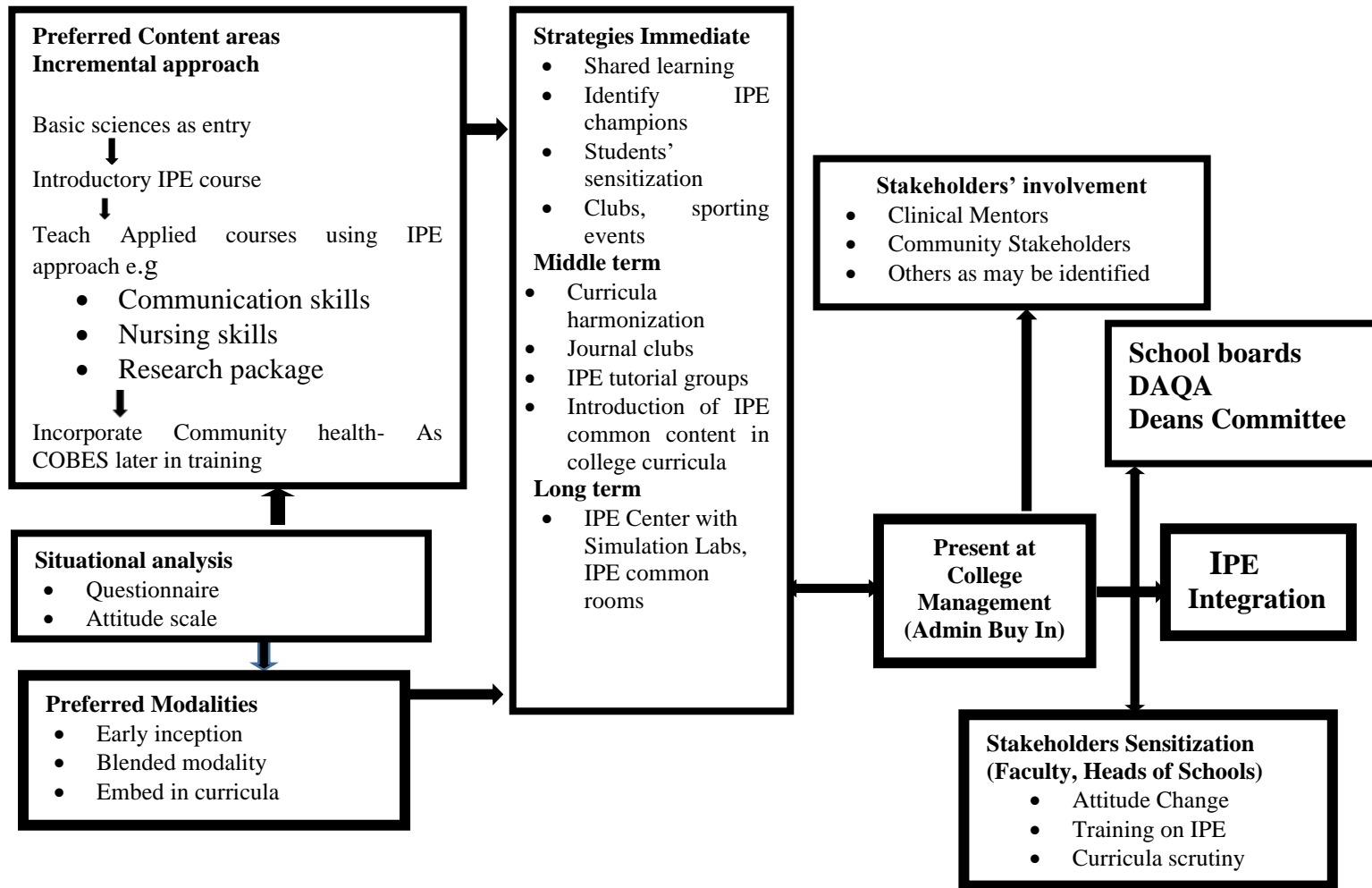


Figure 4.4: Model after Validation

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introductions

This chapter brings forth the discussion of the interpretation and linkage of the results with literature and brings out the researcher's thoughts into the findings. It also includes the study's conclusions based on the objectives of the study and recommendations drawn from the study findings.

5.2 Discussion

5.2.1 Bio-demographic Characteristics

Respondents who were male, in lecturer position and in the school of medicine were more. This could be explained by the fact that there are more programs and departments in the school of medicine. These findings corresponds to a Korean study among faculty that had more male faculty within the school of medicine having more respondents because the program size was larger compared to others (Rangel et al., 2016) . Faculty in this study were middle aged which also explains the larger number within the middle teaching cadres as its typical in most institutions where fewer faculty are at the lowest cadre with few at the top cadres and the majority at the middle level cadres (Rangel et al., 2016).

5.2.2 Faculty's knowledge on Interprofessional education

Slightly more than half of the respondents defined IPE under the theme learning together depicting the common misconception that IPE is synonymous to shared or multi-professional learning. Only a tenth defined IPE correctly. The low knowledge from the open-ended question can be linked to the fact that 30% didn't know about IPE at all and a further 59 % saying they were novices. Though almost all faculty hadn't practiced IPE

before, they almost unanimously agreed they would support IPE initiatives if they were introduced at the college. These findings are as expressed by Rangel et al., (2016) that though faculty had inadequate knowledge on IPE, it was important that they would support. In yet another study, low knowledge on IPE and low confidence to facilitate IPE initiatives was reported hence the need to train faculty on IPE (Hinderer et al., 2016).

Further on knowledge, the knowledge mean score was 9.62 ± 0.12 against a cut off $< 80\%$ (9.6/12). This showed that after IPE was unpacked, faculty knowledge level increased. Faculty being familiar with multi-professional learning as shown from the open-ended question depicts that they had an idea so when the items on IPE were unpacked, their awareness improved. Faculty in this study indicated they hadn't practiced IPE at JKUAT and hadn't received any trainings on it. These findings are in tandem with others among faculty who were found to be knowledgeable on IPE with a positive knowledge score where most reported having not attended any IPE trainings and seminars (Moyce et al., 2017, Rangel et al., 2016).

5.2.3 Attitudes of Faculty on Interprofessional Education

Respondents from this study had positive attitudes towards IPE. Attitude to a large extent shapes acceptance and adoptability of ideas and in this case IPE. Several studies in Iraq, USA, Korea, UAE have reported positive attitudes towards IPE (Al-qahtani & Guraya, 2016, Dallaghan et al., 2016, Salama et al., 2018, Hinderer et al., 2016, Yune et al., 2020b). In Nebraska, using Nebraska Interprofessional Education Attitudes Scale (NIPEAS) which borrows largely from the scales adopted in this study reported positive attitudes in a study among nursing, medicine, public health, pharmacy and allied health sciences departments at their health sciences college (Dallaghan et al., 2016). In a Kingdom of Saudi Arabia (KSA) study conducted in 2 universities using the Readiness for Interprofessional Learning Scale (RIPLS) reported positives attitudes (Al-Qahtani & Guraya, 2016). In a study using the three subscale as in this study, Delnart, (2012) concluded that faculty had good overall attitudes towards IPE in the three subscales. In

this study, while the overall attitude score subscale 1 and 2 were positive, attitudes of IPE in academic setting scale 3 yielded a negative score. (See Table 10). The statements;- IPE courses are logistically difficult, Students like courses taught by faculty from other departments and faculty like teaching students from other departments had negative scores in a study in Indiana University (Delnart, 2012). While faculty would embrace IPE, they weren't sure of its suitability and adoptability in academic settings further pointing out to professional stereotypes and cocoons. Efforts need to be put to avert these negative sentiments before adoption of IPE into training. Salama (2018) in their study reported lower scores in this subscale though not negative scores as in this study (Salama et al., 2018).

There was no statistically significant difference between the bio-demographic characteristics of gender ($P=0.511$), age ($P=0.07$), years of experience as health professional ($P=0.353$) and years of experience as educators ($P=0.149$) and attitude towards IPE. Other studies have reported significance differences between biodemographic characteristics and attitudes In a UAE study, being female faculty and having prior experience in IPE were significant in influencing IPE, while age, years of experience as a health professional educator influenced attitudes towards IPE though not to statistical significance with those between 30 to 50 years and having more than 5 years' experience having higher scores (Salama et al., 2018). In a Saudi study, being female and respondents aged 41-50yrs significantly influenced faculty's attitude towards IPE (Al-qahtani & Guraya, 2016). Years of experience was not significant in this study which is contrary to a study in two universities in Rural US that showed negative correlation between years of experience and attitude with those who have more years of experience having negatives attitudes (Hinderer et al., 2016). Faculty older in the profession are stuck in the historical uniprofessional way of training they were subjected to, and this would explain why years of experience and age had no influence on attitude.

The school of affiliation and their academic position did not significantly influence their attitudes towards IPE. On faculty's expertise level ($P=0.061$), novices were 5.3 times more likely to have positive attitudes than those who were not familiar to IPE in this

study. School of affiliation was significant in influencing IPE in an UAE study with the school of nursing reporting higher scores (Salama et al., 2018). There is no structured IPE in JKUAT, no school has adopted the same hence the reason why school of affiliation was not significant

There was a statistically significant association between supporting students from different profession and attitude ($P=0.021$). Respondents who supported different professions learning together were 2.3 times more likely to have a positive attitude as compared to those who didn't support (OR 2.3; 95% CI 1.733 to 2.989). Faculty who said they applied IPE at JKUAT, $P= 0.036$ were 3.8 times more likely to have positive attitudes compared to those who had not applied (OR 3.8, 95% CI 1.093-13.241). This resonates with a previous study which revealed that IPE fosters Interprofessional relationships, hence there is therefore need to put structures that would foster IPE to harness on the positive attitudes from faculty (Hinderer et al., 2016). Additionally, inculcating a culture of IPE among faculty would help harness IPE core competences of Value and Ethics, roles and responsibilities, communication and teamwork (Schmitt et al., 2011).

5.2.4 Faculty and Students' Perceptions towards IPE

Most faculty and student in this study were willing to support IPE. Similar to this study, a systematic review study reported willingness to study with each other (Visser et al., 2017). In a study in Indonesia, nursing students showed better perceptions as compared to the medical students (Syahrizal et al., 2020). This comparison was not reached in this study as the FGDs were mixed for inclusivity and researcher wasn't keen on asking the professional lines they represented. Contrary to this study, most Faculty in a Korea study reported low support for IPE because of the traditional uniprofessional training (Yune et al., 2020b). Those students who reported unwillingness to support IPE cited a programme overload hence they could not take additional units which they may not require. . This perception was wrong as IPE is applicable in a Healthcare practice area.

Students in a study reported fear of leaving their comfort zones and losing already developed bonds as reason for not supporting IPE (Yune et al., 2020a).

Asked why they would support IPE, faculty and students cited teamwork, better resource management, improved quality of training, improving professional relations and improving professional communication as some of the reasons they would support IPE. These came out as perceived benefits of IPE. Additionally, faculty felt IPE would add value to training as synergy derived from different professions coming together would enrich training. Professions would understand each other better clarifying their roles and reducing conflicts among health professionals. Lack of mutual respect among professions that result to stereotyping and professional cocoons would be eliminated. These reasons also correspond to benefits of IPE as documented in several studies. A study at University of Washington, USA found development of personal relationships, improved education, improved patient care and improved job satisfaction as benefits of IPE (Carney et al., 2019). In another study in Germany, development and promotion of interprofessional thinking and acting, patient centered care, acquisition of shared knowledge, promotion of information and knowledge exchange, mutual respect and understanding and reduction of hierarchies were enlisted as benefits (Homeyer et al., 2018). Similar benefits as in this study were reported in studies among students (Visser et al., 2017, Alruwaili et al., 2020). With these benefits, the importance of IPE and its space in training and practice can't be ignored. There is need to investigate how IPE initiatives could be integrated in training to tap on these benefits.

From both quantitative and qualitative findings from faculty, the perceived hindrances to IPE were: - differing curricula (structure, timelines, and implementation), constrained resources (infrastructure, time, and human resource), constrained professional relations (negative attitudes, stereotyping, inferiority/ superiority complex, professional cocoons, and competition among professions) and professional regulation. The same themes emerged from FGDs among students. These findings related to several others as described here in. A study at the University of Nebraska showed scheduling conflicts, lack of support, not aware about IPE and IPE not being relevant as some hindrances

(Dallaghan et al., 2016). In another study, lack of standardization and differing levels of knowledge, resources (time, finances, person) and low appreciation and mutual respect between professional were cited as hindrances to IPE (Homeyer et al., 2018). Curricula differences, differing opinions on importance of IPE among professions and unwillingness to support IPE initiatives were the perceived hinderances in a study in west Coast California (Lash et al., 2014). In a systematic review by (Sunguya et al., 2014), highlighted challenges included curriculum challenges, resources, stereotypes and attitudes, varying student characteristics and differing IPE concept as challenges In a UK based systematic review similar challenges were reported. Curricula challenges, stereotyping, interprofessional differences, lack of an IPE framework, fear of losing professional identity and negative attitudes and constrained resources were identified as barriers to IPE in a sequential mixed methods study among students in Switzerland (Berger-Estilita et al., 2020). In yet another mixed methods study, students identified negative perceptions towards IPE and other professions as the major hinderance to IPE (Walker et al., 2019). Students mindset on IPE, limited exposure to IPE, gender related issues and failure to consider it as important were identified in students' based study in (Visser et al., 2017). Change of attitude among faculty and students came out strongly in this study as an area that needed to be addressed for successful buy in of IPE in curricula. These sentiments are shared in a systematic study that saw the need to incorporate affective domain as we reorient training to incorporate IPE (Visser et al., 2017). These bottle necks would need to be addressed as they have potential to derail IPE efforts. Some of the suggested solutions to the hinderances included intentional meetings at college level to discuss IPE matters, sensitization of faculty members on IPE, appointing IPE champions among others. The need for training members before commencement of IPE initiatives has been emphasized in previous studies (Hinderer et al., 2016 , Lash et al., 2014). In another study, college wide events, deliberate inclusion of all departments into IPE initiatives and superimposing IPE into existing curricula were considered to be useful in addressing the barriers (Dallaghan et al., 2016).

When respondents were asked to comment on their preparedness in KAP towards IPE, most felt prepared but FGDs and KIIs pointed to challenges in attitudes among the teaching staff that would need to be addressed before commencement. These sentiments relate to the scores of sub scale 3 on attitudes that reported negative attitudes towards IPE in academic settings. These findings are similar to another study that saw the need of training on attitude change among faculty before commencement of IPE programs (Hinderer et al., 2016, Lash et al., 2014). The students were prepared to learn together however they weren't sure of faculty's specific expertise on IPE. They felt learning together would bring team spirit and togetherness among students especially in the clinical areas. A mixed method study in Switzerland saw the need of facilitators training before commencement of IPE (Berger-Estilita et al., 2020).

There were no policies that were cited to be against IPE at the college and University management would be supportive of IPE initiatives. These findings relate to a study in USA in three universities which underpinned the need for administrative support and other stakeholders (Bridges et al., 2011).

5.2.5 Proposed Content Areas for IPE by faculty

From phase 1 and 2 of the study, Faculty enlisted Basic sciences with similar scope as the main suggested content for learning together as a good entry point to IPE. An introductory IPE course was suggested to equip learners with IPE competences. Others suggested content areas by majority included Research package, nursing skills, communication skills, first aid, community health, medical ethics among others. From the students FGDs similar sentiments emerged. While there is no specific defined content for IPE, different countries and institutions have adopted different contents based on the needs, resources and how the programmes are structured. (Toronto, 2009). Community attachment and outreaches, pedagogy learning for specific designed IPE initiatives as well as clinical learning were enlisted as common content areas for IPE among health professions in a students based study (Walker et al., 2019). The outcome of IPE initiatives is to equip health professional students with 4 key competences

sometimes known as domains namely Values and Ethics Teamwork, Interprofessional communication, roles and responsibilities (IPEC, 2016). From this study, it came out that careful consideration of the level at which they should be learned is key considering that different programmes have different timelines and the units are taught at different levels is key. In another study, the authors felt curricula scrutiny to examine common units with similar content and depth across schools could be a good starting point for (Safabakhsh et al., 2018). In line with these assertions, these cross-cutting units could be learnt using a shared approach where concepts of IPE can be introduced.

5.2.6 Proposed Preferred Modalities of IPE by faculty

There was agreement from the qualitative study that IPE initiatives should be incorporated early in training and followed through training and emphasized in senior years as students prepare to exit into practice. This would help inculcate a culture of IPE among students and faculty. These findings are in line with others that argued IPE should be introduced early to help in development of professional identities but would have more impact when introduced later in training after students have formed individual professional identities and attitudes. On the other hand, some support incorporating IPE later in the curriculum after health care students have gained experience, insight, a sense of their own profession identity and a much clearer idea of their future responsibilities in practice. These divided opinions were also found in literature (Williams et al., 2012). An early inception was preferred in a study in University of Jordan and Riyadh University respectively (Fawaz & Anshasi, 2019, Alruwaili et al., 2020). Similar to this study, though census was built, students were divided in yet another study, with those in support of early citing students hadn't developed prejudices about each other and those of later arguing it would enhance networking and interpersonal support amongst themselves (Berger-Estilita et al., 2020).

Participants from the qualitative arm felt there should be some form of evaluation to IPE initiatives with some supporting examination and others some form of assessment not necessarily exams. These relates to assertions on the importance of some form of

feedback and peer evaluation following IPE initiatives by Diggele et al., (2020) and Bridges et al., (2011).

Participants in this study (94.4%) preferred a blended modality for IPE delivery where two or three modes of delivery are chosen. This was the same from the qualitative arm that incorporates classroom, clinical and community modalities preferred. Some of the common modalities include Didactic, clinical learning, simulation, and community approach. These findings correspond with a study that asserts there are many modalities that can be adapted to implement IPE, there is however no single modality that can be applied universally as they vary between and among countries (Regmi & Regmi, 2016). Some studies in USA, preferred mode was Simulation with computer assisted simulations being widely used (Bridges et al., 2011, Tullmann et al., 2013). The resources and infrastructure available will also dictate the choice of modality. In studies done in Africa though there was aspects of other modalities, community approach dubbed COBES was common as seen in UDS-SMHS-Ghana, Makerere University and Moi university (Chang et al., 2011, Mining, 2017). Other studies have supported blended approach as documented by Teodorczuk et al., (2016).

While embedding IPE modality of choice into existing curricula was the most sustainable approach, key informants and students in this study felt that online short programmes on IPE that can run parallel with their curricula could be implemented as we await the long-time structured initiatives. One student was for the proposition that IPE should be optional as it comes to bloat the curricula and already the programme schedules are so tight. Harnessing on technology would help us circumvent the constrained infrastructure and conflicting timelines we have and take advantage of the already existing systems to deliver IPE. The view from this study is similar with one in Thomas Jefferson university that say use of Google doc™ and Google hangout™ implemented into the clinical rounding experience. The utilization of technology eliminates the challenge of physicality and the logistics of bringing students from multiple disciplines together and are as good as other modalities in bringing professions together and instill in them the traits of IP (Jcipe & Shaffer, 2014). Further, these

sentiments related to those in a study that felt IPE should be formal and in curriculum as when it was made informal faculty and students would not take it seriously(Walker et al., 2019). Finding a balance between formal and informal IPE initiatives will improve acceptance by students (Michalec et al., 2017).

5.2.7 Model Development

The four steps of Grounded Delphi Method were applied in the development of the model. This is an emerging theory that combines tenets from grounded theory and Delphi Technique to broaden the scope of the two theories (Howard, 2018, Moe, 2011). The qualitative arm of the study used grounded theory into the in-depth enquiries that yielded information that is key inputs into the model. Modified Delphi was used to determine the cut off point for consensus of model scoring among experts. Four experts achieved cut off score on 1st round while 5th expert on 2nd Round. Just like in this study, a European study that used Delphi to validate a model for Prostate cancer screening reached consensus after two rounds (Keeney et al., 2021).

The developed model prescribes the road map that would aid in integrating IPE in JKUAT. Its constructs include situational analysis, identifying the content areas and modalities to be adopted, the strategies for adaption, stakeholders' involvement, faculty sensitization and involvement of curriculum review stakeholders with the university. There is no prescribed model for IPE integration that can be applied universally as different institutions have different interests and the resources differ. Adopting a model that will aid incorporating IPE competences in the training of health professionals is encouraged (IPEC, 2016). Some strategies adopted in this model are similar to those suggested in a study research from University of Central Lancashire (Gordon, 2019).

A four step model was suggested in a study by Wang & Zorek, (2016). California-Interprofessional Education research academy Model (CA-IPERA) has been adopted in many settings (Ahmady et al., 2017).

5.3 Study Limitations

There is no structured IPE programme at JKUAT and therefore faculty responses were based on their knowledge and attitudes acquired elsewhere.

This study is conducted in one public university and therefore can't be generalized to other universities in Kenya. The findings however are useful in informing the status of attitudes towards IPE and can be inferred in similar settings.

The study was done at the peak of Covid 19 pandemic and that may have caused inability to achieve full sample. The achieved response rate is however acceptable.

5.4 Conclusion

Faculty were knowledgeable IPE by scoring. Interprofessional education is often mistaken for shared learning as it was seen from the open-ended questions responses. While many respondents had not practiced it either in training or in practice, they were willing to support its adoption.

The overall attitudes of faculty towards IPE were positive with attitudes of IPE in academic settings being negative. The expertise level of faculty was significant in influencing their attitudes towards IPE. The bio-demographic characteristics of faculty were not significant in influencing faculty's attitude. School of Medicine and Nursing reported better attitudes compared to the other schools. Faculty who supported other professions in IPE were 2.3 more times to have positive attitudes towards IPE.

On Faculty and students' perceptions towards IPE, teamwork, better resource utilization, improved interpersonal relations and better communication were enlisted as the perceived benefits for IPE. Despite the benefits, perceived challenges that would impede its adoption included curricula challenges, professional relations challenges (Negative attitudes, stereotyping, superiority and inferiority complexes', sense of competitiveness), constrained resources at the college and differing professional regulations. Faculty felt

prepared to facilitate IPE with students feeling ready to be facilitated but both felt need for sensitization training before commencement.

Basic sciences with same depth and scope were a good entry point to learning together as they are done early in the training. Further an introductory IPE course, followed through by an applied course for IPE like Research, communication skills, nursing skills and terminating with community health using a COBES approach are areas schools could explore to integrate IPE in curricula.

IPE initiatives are best incorporated early in training and a form of evaluation incorporated. The preferred modality was a blended mode with a favor towards a blend that incorporates class, community, and clinical learning modality.

5.5 Study Recommendations

Based on the study findings the research gives the following recommendations: -

To the college of health sciences

1. A sensitization training to faculty about IPE, its competencies and concepts would be useful to faculty to revert the negative attitudes towards IPE among faculty and differentiate it from shared learning
2. Streamlining of shared learning as a good starting point into IPE for health profession courses with similar depths and scope e.g., Basic sciences. Team teaching among faculty is encouraged.
3. Establishment of Intentional forums where faculty and students from the various schools can interact socialize and know each other. This will enhance mutual trust, break professional barriers, and improve on communication and see each other as colleagues and not as stand-alone professionals. An example could be Journal clubs, sporting events, college wide students' association or faculty common room.

4. Establishment of an IPE center as a long-term recommendation to coordinate IPE activities at the college.
5. In line with increasing IPE sensitization, appointment of IPE champions drawn from each school to act as IPE advocates
6. Due to tight schedules and timelines, harnessing unto the available technology to introduce IPE to students at the college could be done where students can engage off the regular scheduled course timelines

5.6 Recommendations for Further Research

The research recommends further research on: -

1. An in-depth student perspective about IPE and their willingness to learning with, from and about each other.
2. An interventional study among faculty and students where sensitization of IPE is offered as an intervention

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APPENDICES

Appendix I: Questionnaire and Attitude Scale Informed Consent Document

Study title: A model for integrating Interprofessional Education in the Training of health sciences at, COHES, JKUAT.

Introduction- I want to thank you for finding time to meet me today. My name is Rosemary Kawira working on a study titled ‘Integration of Interprofessional Education in the Training of health sciences at, COHES, JKUAT’

The purpose of the study is to gather insights from faculty on Knowledge and attitudes, preferred modalities in IPE and subsequently develop a model for integrating IPE in the training of students.

Procedures- we will administer a questionnaire and an attitude scale. The questionnaire will be exploring general information, Interprofessional education knowledge and modalities for IPE implementation. The attitude scale has 42 items in a 5-point Likert scale consisting of three subscales on attitudes towards Interprofessional education, Interprofessional education in academic setting and attitudes towards health care teams’ attitude scale to collect data for this study. It is approximated that it will take 20 minutes to fill it up. You can fill as we wait or can choose to drop at a designated box placed at your school’s reception area.

Recording of the study- the FGDs and KII proceedings will be recorded using a video, Camera. The video will be solely used for the purpose of the study. The video will be transcribed and will be stripped off any personal identifying information as codes will be used. It will be stored in a lockable cupboard and in a laptop for this research that is only accessible for purposes of research. The recordings will be stored for 6 years and will be deleted thereafter from all the sources

Benefits - Through interaction with other faculty, you will gain insights on IPE and contribute to the development of the model.

We hope the findings of this study will be useful in putting in place an IPE programme for adoption by the college.

Risks- Participating in this study is not likely to create any significant risk for you. All the information that we get from you will be treated with confidentiality. We will not include any identifying information on the questionnaire but will request for your mobile number for communication regarding the study.

Voluntary participation- Participation in this study is voluntary. You do not have to talk about anything that you are not comfortable with and you can withdraw from the study at any time.

Confidentiality- All the responses will be kept confidential and will be shared only with research team members. Any information we include in our report will not identify you the respondent.

Contact for the Principal Investigator-In case you need further clarification regarding your participation in this study, contact the principal investigator Rosemary Kawira on 0723 99 33 00

Permission to Proceed-I have understood the purpose of this study, procedures, risks and benefits and I would like to take part in the study. I also agree that my voice may be recorded for the purpose of this research.

Respondent Signature..... DateMobile Number
.....

Witness signature..... Date.....

Appendix II: Focused group discussion informed consent document

Study title: A model for integrating Interprofessional Education in the Training of health sciences at, COHES, JKUAT.

Introduction- I want to thank you for finding time to meet me today. My name is Rosemary Kawira working on a study titled ‘Integration of Interprofessional Education in the Training of health sciences students at, COHES, JKUAT’

The purpose of this study is to gather insights from faculty on Knowledge and attitudes, preferred modalities and content for IPE and subsequently develop a model for integrating IPE in the training of students through FGDs.

Procedures- We are asking faculty in COHES to participate in this study. It is your choice whether or not to participate in this study, and there will be no negative consequences if you decline. We will conduct a FGD estimated to take 1 hour of your time. The principal investigator will be the moderator with a research assistant helping in taking notes and recording the discussion. You do not have to answer any question that you feel uncomfortable with.

Recording of the study- the FGDs proceedings will be recorded using a voice recorder. The recording will be solely used for the purpose of the study. It will be transcribed and will be stripped off any personal identifying information as codes will be used. It will be stored in a lockable cupboard and in a laptop for this research that is only accessible for purposes of research. The recordings will be stored for 6 years and will be deleted thereafter from all the sources

Benefits - The benefit of participating in this study is that through interaction with other faculty you will gain insights on IPE and contribute to the development of the model.

We hope the findings of this study will be useful in putting in place an IPE programme for adoption by the college.

Risks- Participating in this study is not likely to create any significant risk for you. All the information that we get from you will be treated with confidentiality. We will not include any identifying information in the notes taking and during transcribing.

Voluntary participation- Participation in this study is voluntary. You do not have to talk about anything that you are not comfortable with and you can withdraw from the study at any time.

Confidentiality- All the responses will be kept confidential and will be shared only with research team members. Any information we include in our report will not identify you the respondent.

Contact for the Principal Investigator-In case you need further clarification regarding your participation in this study, contact the principal investigator Rosemary Kawira on 0723 99 33 00

Permission to Proceed-I have understood the purpose of this study, procedures, risks and benefits and I would like to take part in the study. I also agree that my voice may be recorded for the purpose of this research.

Respondent Signature..... DateMobile Number
.....

Witness signature..... Date.....

Appendix III: Key Informant Informed Consent Document

Study title: A model for integrating Interprofessional Education in the Training of health sciences at, COHES, JKUAT.

Introduction- I want to thank you for finding time to meet me today. My name is Rosemary Kawira working on a study titled ‘Integration of Interprofessional Education in the Training of health sciences students at, COHES, JKUAT’

The purpose of this study is to gather insights from educational administrators at COHES, on Knowledge and attitudes, preferred modalities in IPE and subsequently develop a model for integrating IPE in the training of students.

Procedures- We are asking Administrators in COHES to participate in this study. The study is voluntary, and there will be no negative consequences if you decline.

We will interview you for approximately 30 minutes using an interview guide. We will also record the interview to add in transcribing for data analysis.

Recording of the study- the KII proceedings will be recorded using a voice recorder. The recording will be solely used for the purpose of the study. The recordings will be transcribed and will be stripped off any personal identifying information as codes will be used. It will be stored in a lockable cupboard and in a laptop for this research that is only accessible for purposes of research. The recordings will be stored for 6 years and will be deleted thereafter from all the sources

Benefits - The benefit of participating in this study is that your insights from the interview will contribute to the development of an IPE model that will be proposed for adoption in JKUAT.

Risks- Participating in this study is not likely to create any significant risk for you. All the information that we get from you will be treated with confidentiality. We will not

include any identifying information on the questionnaire but we will record your voice to back up notes taking.

Voluntary participation- Participation in this study is voluntary. You do not have to talk about anything that you are not comfortable with and you can withdraw from the study at any time.

Confidentiality- All the responses will be kept confidential and will be shared only with research team members. Any information we include in our report will not identify you the respondent.

Contact for the Principal Investigator-In case you need further clarification regarding your participation in this study, contact the principal investigator Rosemary Kawira on 0723 99 33 00

Permission to Proceed-I have understood the purpose of this study, procedures, risks and benefits and I would like to take part in the study. I also agree that my voice may be recorded for the purpose of this research.

Respondent Signature..... DateMobile Number
.....

Witness signature..... Date.....

Appendix IV: Study Questionnaire on Knowledge of Faculty on Interprofessional Education

A: Study Questionnaire on Knowledge of Faculty on Interprofessional Education

Bio-demographic data

1. Gender: Male Female
2. What is your age in Years?
3. What's your academic position?
 - Graduate assistant
 - Tutorial fellow/assistant lecturer
 - Lecturer
 - Senior lecturer
 - Associate professor
 - Professor
4. Which is your school at the College of Health Sciences (COHES), JKUAT?
 - Public health
 - Medicine
 - Nursing
 - Bio Medical sciences
 - Pharmacy
5. What is your area of specialization? -----

6. How many years of experience do you have as a health professional? -----

7. How many years of experience do you have in teaching at the university? -----

IPE Questions

8. What do you understand by the term Interprofessional Education (IPE)?

9. How best would you describe your current expertise in IPE?

- a. Not Familiar with IPE
- b. Novice (some familiarity)
- c. Experienced
- d. Very experienced
- e. Expert

10. Have you applied it at COHES, JKUAT? Yes No N/A

11. Would you support students from different profession learning together in the College of health sciences JKUAT? YES NO

Explain your answer-----

12. What are some of the content areas, you would suggest to be learned together at COHES?

13. Which of the following modalities would be best suited to the deliver the content suggested in 12 above:

- a) Classroom teaching
- b) Clinical teaching
- c) Skills laboratory
- d) Community based learning
- e) A blend of two or more of the above

14. Kindly tick (Y) for YES or (N) for NO on the following items.

No	ITEM	Y	N
1.	Interprofessional education occurs when two professions learn together in a shared unit		
2.	Interprofessional education occurs when faculty or students from two or more professions learn from, with and about each other		
3.	IPE occurs when students and faculty engage in joint problem solving around patient/ client care		
4.	IPE happens when a faculty demonstrate a skill to students from a different profession on request by the student		
5.	IPE guides faculty n students gain negotiation skills and leadership skills useful in practice		
6.	Teams and teamwork, Communication in health, Roles and responsibilities and Values and Ethics are IPE competences		
7.	IPE helps improve self-esteem, confidence among professionals and makes health care teams cohesive by removing stereotyping.		
8.	IPE fosters mutual respect and mutual trust among professionals		

9.	IPE fosters collaborative practice as professionals understand each other's role		
10.	Through IPE some professions get recognition as superior to others		
11.	Interprofessional education adds value to training when it is an examinable subject		
12.	IPE is best when introduced early into health professions training		

Appendix V: Attitude Scales

Please complete the following Scale examining the attitudes of health sciences Faculty towards Interprofessional education. Use the scale **SA = Strongly Agree; A= Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.**

NO.	ITEMS	SA	A	N	D	SD
ATTITUDES TOWARDS INTERPROFESSIONAL EDUCATION ITEMS						
1.	Interprofessional learning will help students think positively about other health professionals					
2.	Students in my professional group would benefit from working on small-group projects with other health profession students					
3.	Communications skills should be learned with integrated classes of health care students					
4.	Interprofessional learning will help to clarify the nature of patient problems for students					

5.	It is not necessary for undergraduate health care students to learn together.					
6.	Learning with students in other health professional schools helps learners to become more effective members of a health care team					
7.	Interprofessional learning among health care students will increase their ability to understand clinical problems					
8.	Interprofessional learning will help students to understand their own professional limitations					
9.	Interprofessional learning among health professional students will help them to communicate better with patients and other professionals					
10.	Team-working skills are essential for all health care students to learn					
ATTITUDES TOWARDS INTERPROFESSIONAL HEALTH CARE TEAMS ITEMS						
11.	Clients receiving Interprofessional care are more likely than others to be treated as whole persons					
12.	Developing an Interprofessional client care plan is time-consuming					
13.	Interprofessional approach makes the delivery of care more efficient					
14.	Developing a client care plan with other team members avoids errors in delivering care improving decision making					
15.	Working in an Interprofessional manner unnecessarily complicates things most of the time					
16.	The Interprofessional approach improves the quality of care to clients					
17.	Health professionals working as teams are more					

	responsive than others to the emotional and financial needs of clients					
18.	Having to report observations to a team helps team members better understand the work of other health professionals					
19.	Hospital patients who receive Interprofessional team care are better prepared for discharge than other patients					
20.	Team meetings foster communication among members from different professions or disciplines					
ATTITUDES TOWARDS INTERPROFESSIONAL LEARNING IN THE ACADEMIC SETTING						
21.	Interprofessional learning better utilizes resources					
22.	Students like courses taught by faculty from other academic departments					
23.	Students like courses that include students from other academic departments					
24.	Faculty at COHES should be urged to participate in Interprofessional courses					
25.	Faculty like teaching students in other academic departments					
26.	Faculty like teaching with faculty from other academic departments					
27.	Interprofessional efforts weaken course content					
28.	Interprofessional efforts require support from college/university administration					
29.	Faculty should be rewarded for participation in Interprofessional courses					

30.	Accreditation requirements limit Interprofessional efforts					
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Appendix VI: Focused Group Discussion guide

1. What do you understand by the term IPE?
2. After Reflection, have you engaged in any form of IPE in your training and practice? (Formal or Informal)
3. Is IPE appropriate/important in health professions training? If yes, How? If NO, Why?
4. What are some of the Benefits of IPE?
5. When should IPE be introduced in training? Should it be an examinable course?
6. Who should be involved in IPE design and implementation?
7. In your view what should be contained in an IPE curriculum content?
8. How should IPE be implemented? (Modalities)
9. What effect would an IPE programme have to the already existing curricula? Would you be willing to revise your curriculum to incorporate it?
10. What would some of the challenges of IPE adoption at JKUAT? What can be done about these challenges?
11. What are some of the strengths and gaps that the current curriculum that IPE would strengthen/fill?
12. Would you support IPE integration into curriculum? YES/NO and Why?
13. Are there any Policy to or against IPE at JKUAT? If Yes name them.
14. Comment on Administration support towards IPE implementation.
15. Comment on your preparedness (KSA) to design and implement IPE

Appendix VII: Key informant interview guide

1. What do you understand by the term IPE? (Several definitions came with learning together being the main)
2. After Reflection, have you engaged in any form of IPE in your training and practice? (Formal or Informal)
3. When should IPE be introduced in training? Should it be an examinable course?
4. Who should be involved in IPE design and implementation?
5. In your view what should be contained in an IPE curriculum?
6. How should IPE be implemented? (Modalities)
7. What effect would an IPE programme have to the already existing curricula? Would your department be willing to revise their curriculum to incorporate it?
8. What are some of the strengths and gaps that the current curriculum has that IPE would strengthen/fill?
9. Would you support IPE integration into curriculum? YES/NO and Why?
10. What are some of the Benefits of IPE?
11. What would some of the challenges of IPE adoption at JKUAT? What can be done about these challenges?
12. Are there any Policy to or against IPE at JKUAT? If yes name them.
13. Comment on college and university administration support towards IPE implementation.
14. Comment on the schools and college preparedness (KSA) to design and implement IPE
15. Any other thing you would like to add

Appendix VIII: FGD guide for students

1. What do you understand by the term IPE?
2. After Reflection, have you engaged in any form of IPE in your training?
3. When should IPE be introduced in training? At what level of training should it be introduced? Should it be an examinable course?
4. In your view what should be contained in an IPE curriculum? What are those areas you feel students at the college could all do together?
5. How should IPE be implemented? (Modalities)
6. What are some of the Benefits of engaging in IPE?
7. What would be some of the challenges of IPE adoption at JKUAT among students? What can be done about these challenges?
8. Any other thing you would like to add?

Appendix IX: Model Validation tool

Introduction

My name is Rosemary Kawira a PhD student at the School of Nursing, JKUAT. I am working on a study titled 'A model for Integrating of Interprofessional Education in the Training of health professionals at, COHES, JKUAT. You have been identified as an Expert and having valuable inputs towards improving the study and more specifically validating the model developed as an output of this study. A summary of the study is explained here in and a tool for validation provided at the tail end.

Background

Despite exponential growth and changes technology, medical information, and epidemiology of disease over time, the curriculum implementation period has remained constant. While it may not be possible to change curricula with every change in the health system, delivering the curricula in a manner that embraces these complexities would be helpful. Interprofessional education (IPE) is one such innovations. IPE is an experience that occurs when students from two or more professions learn about, from and with each other to enable effective collaboration subsequently improving health outcome. IPE foster collaborative practice among health care workers and subsequently teamwork at the workplace. Collaborative practice happens when multiple health workers from different professional backgrounds work together with patients, families, and communities to deliver the highest quality of care.

Though there is evidence of IPE at JKUAT through interprofessional grants implementation, there is no structured IPE initiatives at the institution. This study therefore sort to develop a model that would serve as a guide in the integration of IPE at JKUAT.

The study was guided by the following objectives: -

1. To determine faculty's knowledge of Interprofessional education at COHES, JKUAT
2. To identify attitudes of faculty on Interprofessional Education at COHES, JKUAT
3. To explore the faculty's and students' perceptions towards IPE at the COHES, JKUAT?
4. To explore preferred content areas for IPE at COHES, JKUAT.
5. To explore preferred modalities for integrating IPE in the training of health professionals at COHES, JKUAT

Process

The research employed an explanatory sequential mixed method study in three phases. Phase one involved assessing the status of IPE at JKUAT by determining the knowledge using a questionnaire and attitudes of faculty using three subscales on Attitude attitudes towards IPE Scale, IPE attitudes among healthcare teams (ATHCT) scale and attitudes of IPE in academic settings. It also alluded to the benefits of IPE and challenge that faculty felt affected IPE integration. The findings from phase one informed phase 2 which was qualitative in nature. It involved in-depth enquiry of faculty and Students thoughts on IPE. Key informant interviews from Education administrators too on Ipe and support was explored. This phase yielded students and faculties perceptions on IPE benefits and challenges to adoption and hoe to overcome them. It also bore the modalities for IPE delivery should it be adopted and suggested key content areas that could be included for IPE.

The last phase involved using the data derived from phase one and two to develop a model for interprofessional Education integration into curricula at JKUAT. This is the model that you are reviewing as an expert. Modified Delphi Technique will be used to validate the model.

Key Findings

Faculty in this study were knowledgeable on IPE by score however when asked directly what IPE is 42% of them defined it as shared learning a common misconception. The overall attitude of Faculty was positive. There were however negative attitudes of IPE in academic Settings subscale.

Faculty and students felt Ipe would improve the quality of training, improve interpersonal relationships, improve professional communication, and make them better team players in practice. They however felt curricula complexities (varying programme durations, conflicting schedules), limited resources (infrastructure, human resource shortages,), professional related challenges(Stereotyping, superiority and inferiority complexities, attitudes towards each other) as my hinderances to IPE adoption.

On modalities, introducing IPE early in profession, having it examined and embedded in Curricula was suggested. A blended modality of delivery was suggested.

On preferred content areas, implementing shared learning on the basic sciences with common content and depth was suggested. Other areas suggested included research package to include Research methods, epidemiology and statistics, nursing skills, communication skills, first aid and BLS and health systems management was suggested. The college is to agree on what to start with and incrementally add should there be need.

Some of the strategies that were proposed that are also the recommendation from this study included IPE training and sensitization, implementing shared learning, informal strategies including journal clubs, sporting events and students' association. A faculty common room would be a good venue to have IPE conversations informally. Identifying IPE champions across the college would be used. In the long term an IPE center to co-ordinated IPE activities is recommended.

You are therefore requested to give your views on the proposed model using the model below: -

Check List for Model Validation

Expert No ----- **Age** ----- **Gender**-----

Area of Expertise-----

Years of Experience in University Teaching -----

No	Item	Yes	No
1.	Is the model simple, clear, and easy to follow?		
2.	Is model communicating to the reader/ recipient? (Logical)		
3.	Does the model devolve of technical jargons?		
4.	Is the model understood for implementation?		
5.	Is the suggested content, modalities derived from the study data? (Factual)		
6.	Can the model be replicated in other settings/ generalizable?		
7.	Have all the relevant stakeholders been incorporated in the model?		
8.	In your own opinion can the model be used to integrate IPE into Curricula?		
Any other comment/comments towards improvement of the model?			

Appendix X: Ethical Approval

February 18th 2019

REF: JKU/2/4/896B

Rosemary Kawira Kithuci,
School of Nursing.

Dear Ms. Kithuci,

RE: A MODEL FOR INTEGRATING INTERPROFESSIONAL EDUCATION IN THE TRAINING OF HEALTH PROFESSIONALS AT JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

The JKUAT Institutional Ethics Review Committee has reviewed your responses to issues raised regarding your application to conduct the above mentioned study with you as the Principal Investigator.

This is to inform you that the IERC has approved your protocol. The approval period is from February 18th 2019 to February 18th 2020 and is subject to compliance with the following requirements:

- a) Only approved documents (informed consent, study instruments, study protocol, etc.) will be used.
- b) All changes (amendments, deviations, violations, etc.) must be submitted for review and approval by the JKUAT IERC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the IERC immediately.
- d) Any changes, anticipated or otherwise that may increase the risks to or affect the welfare of study participants and others or affect the integrity of the study must be reported immediately.
- e) Should you require an extension of the approval period, kindly submit a request for extension 60 days prior to the expiry of the current approval period and attach supporting documentation.
- f) Clearance for export of data or specimens must be obtained from the JKUAT IERC as well as the relevant government agencies for each consignment for export.
- g) The IERC requires a copy of the final report for record to reduce chances for duplication of similar studies.

Should you require clarification, kindly contact the JKUAT IERC Secretariat.

Yours Sincerely,




Dr. Patrick Mbindyo
SECRETARY, IERC




Setting Trends in Higher Education, Research and Innovation

Appendix XI: NACOSTI License

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REPUBLIC OF KENYA


National Commission for Science, Technology and Innovation -



NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION.

Ref No: 126166 Date of Issue: 12/September/2019

RESEARCH LICENSE



This is to Certify that Miss. Rosemary Kithuci of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Kiambu on the topic: A MODEL FOR INTEGRATING INTER-PROFESSIONAL EDUCATION IN THE TRAINING OF HEALTH SCIENCES AT COLLEGE OF HEALTH SCIENCES - JKUAT for the period ending : 12/September/2020.


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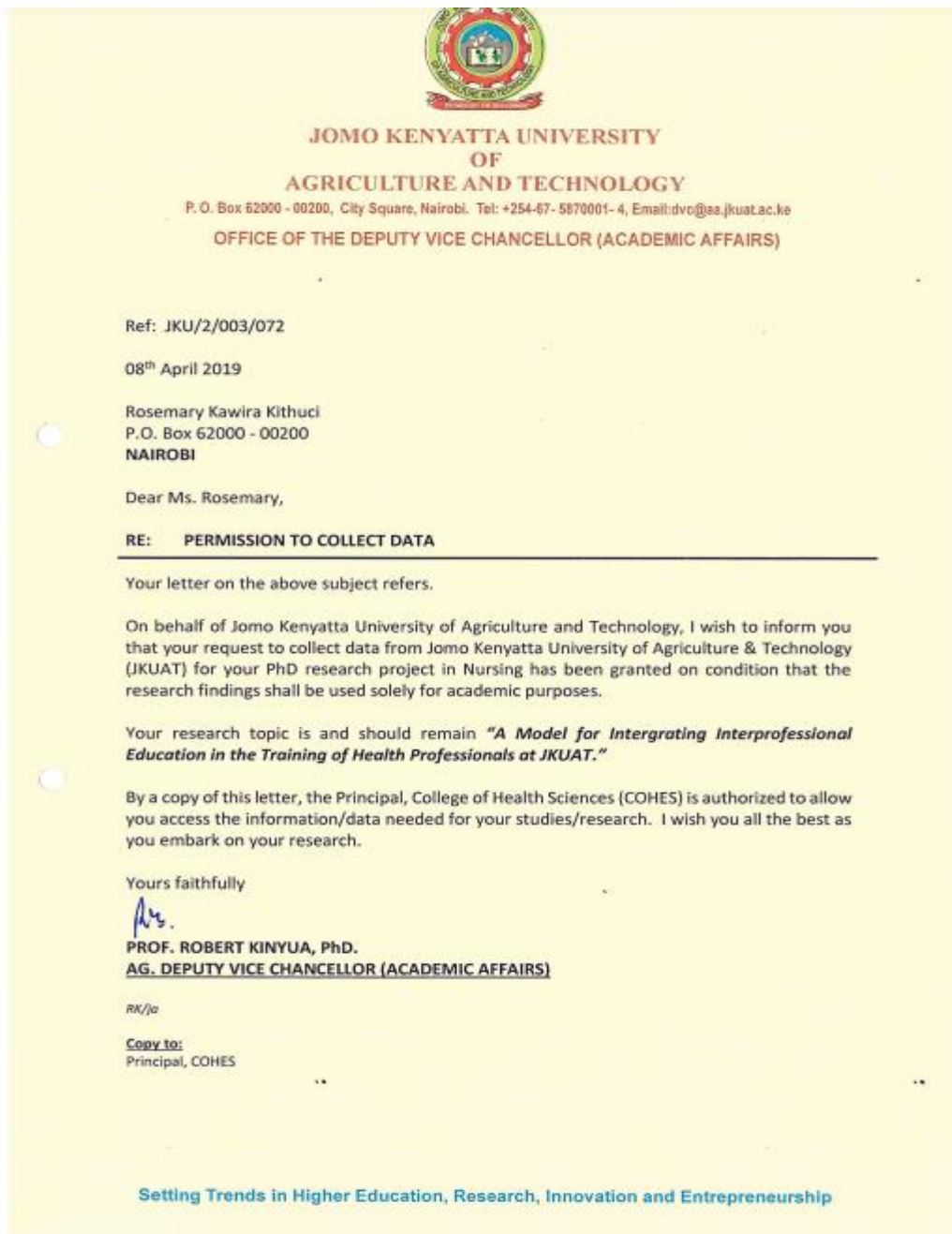
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Appendix XII: Permission to carry out data



Appendix XIII: Publication 1

December 2021

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KNOWLEDGE OF FACULTY ON INTERPROFESSIONAL EDUCATION AT A PUBLIC UNIVERSITY IN KENYA

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KNOWLEDGE OF FACULTY ON INTERPROFESSIONAL EDUCATION AT A PUBLIC UNIVERSITY IN KENYA

R. K. Kithuci, D. Makworo and A. Mutisya

ABSTRACT

Background: Training health professionals in a way that ensures teamwork, collaborative practice and eventually improving quality of care is important. Interprofessional Education (IPE) is one such approach to training. Having faculty that understand and support IPE ensures its uptake and implementation.

Objective: To describe the knowledge of faculty on IPE at a Kenyan public university.

Design: Descriptive cross-sectional study.

Setting: Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya.

Subjects: A total of 71 faculty members of the five schools at the college of health sciences, JKUAT were enrolled into the study between July 2020 and September 2020.

Outcome: Comparison of means of knowledge among schools, academic position, and expertise level.

Results: This study had more males (41, 57.7%) than females, almost half (33, 46.5%) of the respondents held the Lecturer position and the mean age of the respondents was 42 years (SD,6.5). Faculty in this survey had good knowledge on IPE with a score 9.62 ± 0.12 . When asked to define IPE using an open-ended question, 42 (59%) defined it as shared learning. More than half of the respondents 42(59.2%) were novices on IPE. There was no statistically significant relationship between faculty's characteristics and their knowledge on IPE in this survey.

Conclusion: The respondents had favorable knowledge on IPE by score however, when asked to define IPE directly participants misinterpreted IPE to mean shared learning. The participants school, academic position and expertise level did not significantly influence knowledge. It is recommended that there should be sensitization among faculty on IPE.

Appendix XIV: Publication 2



Article 

PanAfrican
Medical
Journal

Research



Attitudes towards interprofessional education and associated factors among faculty at the college of health sciences in a public university in Kenya: a cross-sectional study

 Rosemary Kawira Kithuci, Drusilla Makworo, Albanus Mutisya,  Justus Simba, Patrick Mburugu

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Keywords: Interprofessional education, positive attitudes, faculty, curriculum

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Attitudes towards interprofessional education and associated factors among faculty at the college of health sciences in a public university in Kenya: a cross-sectional study

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Appendix XV: Map of the Study area

