

RELEVANCE OF RESEARCH METHODS TO ACADEMIC REQUIREMENTS AT BOTH UNDER AND POSTGRADUATE LEVELS

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ABSTRACT

Research Methods has become an important determinant of quality education by advancing students and educators to the level of problem solving citizens that are also result oriented at their work places. It is therefore currently one of the major course units in almost all academic disciplines in all universities worldwide. The purpose of this paper therefore was to assess the relevance of teaching research methods as a course unit at both under and graduate levels. The paper also studied the challenges that limit the progress of research methods course in some universities. The arrow framework method used in research was reported to be the best option of handling the problem of research language. A system for sharing research topics among students from developed countries and those from developing countries was recommended as the best solution for solving the existing challenges to the course. The relevant conclusions were developed as well.

Keywords: Research methods, under graduate education, Graduate education

INTRODUCTION

In today's world of academia, where scientific and systematic exploration for knowledge is on high demand, teaching research methods has increasingly become essential need for graduate students to equip them with required tactics of approaching and managing the expanding world's stresses resulting from growing technology, population and natural disasters.

Research methods is currently one of the major course units in almost all academic disciplines in all universities worldwide that every student must do to qualify for their courses awards. Teaching research methods modules are among the most intellectually demanding courses in university education (Howard and Brady, 2015). This course unit is designed to prepare candidates to be research professionals and to enhance their professional practice (Higher Education Commission, 2012)

Research Methods has become an important determinant of quality education and it contains knowledge and learning as a process through its relationship to a comprehensive theory. The most interesting part on research methods that makes it more interesting, is its potential to open the student's eyes and brains to quickly study a situation and apply knowledge to change the existing problems into opportunities. This in line with Nworgu cited OSSAI et al, (2016) who defined educational research as a systematic approach to the solution of educational problems. Also Sarah

Lewthwaite & Melanie Nind 2016, argued that working in this fast-changing environment requires constant vigilance and skills development on the part of learners and teachers.

However some universities especially in developing countries have invested little academic engagement in research methods and some students still complete their bachelor's degrees without conducting research which becomes a serious challenge to these students once they intent to further their academics. Some organizations also limit opportunities of employing students who neither studied research methods nor conducted research at their degree level. While initiatives might recognize the importance of the quality of teaching and learning, there remain few sources of detailed or systematic insights into research methods pedagogy (Melanie Nind et al, 2015).

The purpose of this paper, is to assess the relevance of teaching research methods as a course unit at graduate level.

Approaches to teaching and learning research generally share the aim of making the research process visible by grounding learners' understanding of otherwise abstract principles or concepts (Keenan and Fontaine, 2012). Teaching research methods involves engaging students in practical or problem-based tasks in which they are encouraged to practice, experiment and engage with the topic (Daniel Kilburn *et al*, 2014) which fully prepares students to produce final research report that are guiding to decision makers and the world at large.

RESEARCH METHODS COURSE

Research Methods are the tools and techniques for doing research which provide researchers with ways to collect, sort and analyze information so that they can come to some conclusions (Nicholas Walliman, 2011). The application of research methods is more relevant after establishing a conceptual/ theoretical framework, where students at under or post graduate levels conducting research work are in position to prove to their supervisors the extent at which they grasped the knowledge obtained from class/ lecture rooms

Nicholas Walliman, 2011 argued that if one use the right sort of methods for their particular type of research, then they should be able to convince other people that their conclusions have some validity, and that the new knowledge they have created is soundly based. Researchers should therefore be very keen while selecting the research methods to be applied in their research development to ensure production of results that are beneficial to human being and environment they live in. the research methods selected, should focus on solving the existing problems but not adding or worsening the problems

Research methods course provides a comprehensive introduction to research proposal writing, research methodologies, and foundational research theories and protocols, where students in the course learn about the cyclical nature of applied research and the iterative process of research writing (Dr. Richard Andalon, 2012). The course aims to offer students a good understanding of

the principles and concepts of social inquiry and analysis, and covers four broad topics: the foundation of social science, research design, data collection, and data analysis (Gabriel Bădescu, 2014). It is on this basis that students after fully exhausting the course unit, qualify to develop proposals and use them to establish the final research reports which are required to be produced and submitted by students to their respective departments on completion of their study.

Research projects will always be successful and produce desired and developmental results, once the research process are effectively followed and applied by the researchers. The figure below demonstrates a systematic flow in developing a research project.

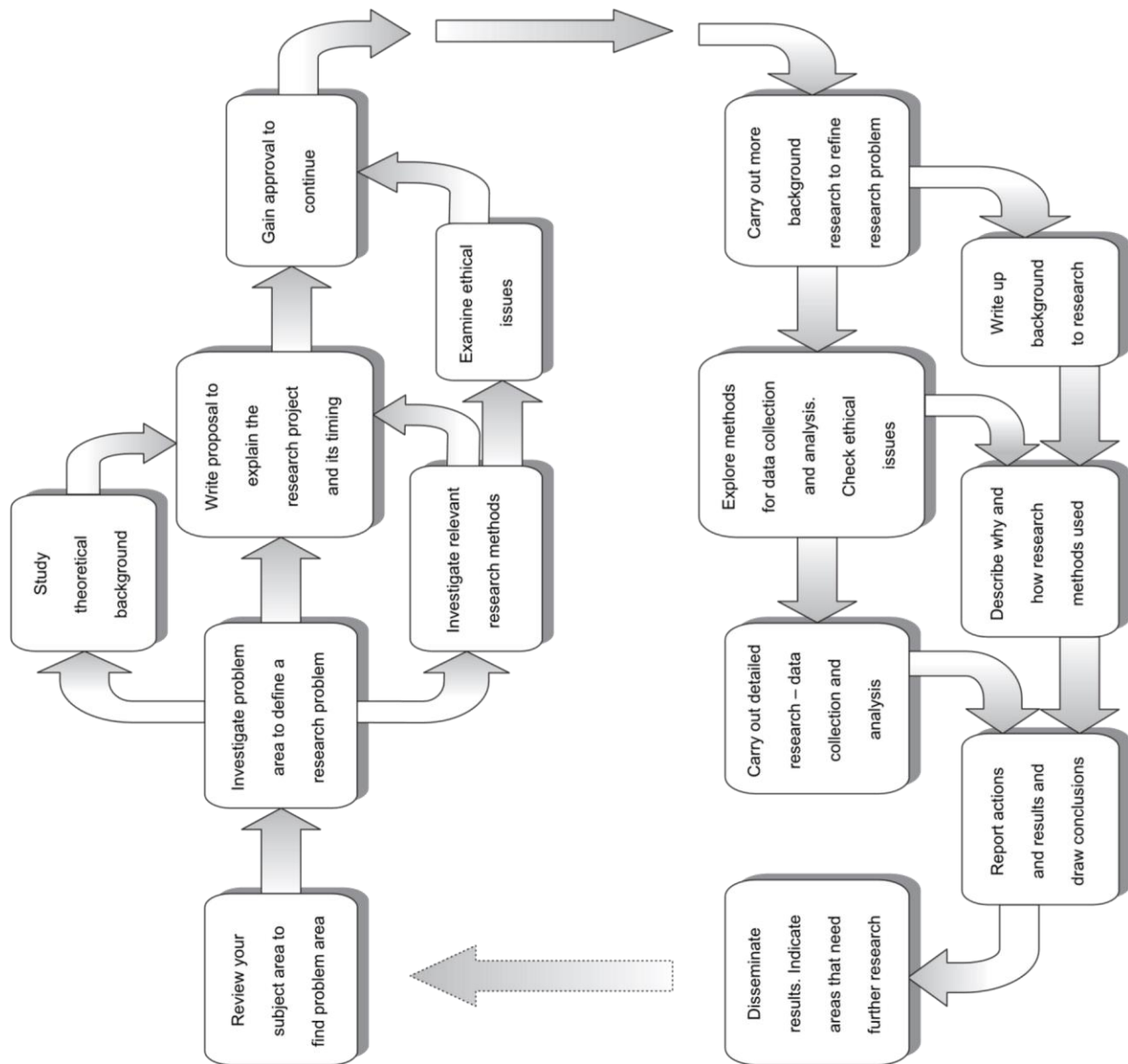


Figure 1: Structure of a typical research project, Source: Nicholas Walliman, 2011.

UNDERGRADUATE EDUCATION

Undergraduate education is the education which is usually undertaken at university after completion of secondary education. Always the minimum requirements for one to be enrolled for under graduate education course, is two principle passes for a degree and one principle pass for a diploma.

An undergraduate degree (also called first degree, bachelor's degree or simply degree) is a colloquial term for an academic degree which includes all the academic programs up to the level of a bachelor's degree and it is taken by a person who has completed undergraduate courses. It is usually offered at an institution of higher education, such as a university and the most common type of this degree is the bachelor's degree, which typically takes at least three or four years to complete (Wikipedia, 2012).

The undergraduate degree is usually offered in two broad categories where students take any of the two, depending on the subjects well performed at high school. It is categorised as bachelors of Science degrees and bachelors of Arts degrees. Science degrees are in most cases obtained after a period of four years and above whereas arts degrees only require three years.

University facilitators /lecturers have appreciated the potential contributions of teaching research methods at undergraduate level as the one of the course units that gives the students the ability to acquire substantial knowledge. Due to the appreciated benefits the program curriculums are designed in a manner that gives research methods 45 credit unit hours to enable undergraduate students have enough training on how successfully conduct research on their own, once they reach their final academic years.

Students who are undertaking science courses must carry out applied research in their final years so as to fully qualify to graduate in their course. The type of research conducted by students undertaking arts courses is called basic research.

On completing the undergraduate courses, students who have invested their time to research methods in class and at the end carry out research work, come out with corrective knowledge and skills related to research design, information or data collection and analysis, information literacy, communication and even other benefits like professional advancement through opportunities such as scholarly publication, becoming part of a learning community, and relationships with mentors and peers (David Lopatto,2010)

David Lopatto further explained that undergraduate researchers learn tolerance for obstacles faced in the research process, how knowledge is constructed, independence, increased self-confidence, and a readiness for more demanding research. This is important because it contributes towards career development of the students.

POST GRADUATE EDUCATION

Postgraduate education is the education given to people who are interested in furthering their academic knowledge and skills mainly after they have obtained bachelor's degrees. It is also possible for candidates who have obtained academic qualifications that are equivalent to bachelor's degree to be awarded post graduate education depending on the type of post graduate degree to be undertaken.

Postgraduate education is offered in four different kinds i.e. taught courses, research degrees, conversion courses and professional qualifications. Of the four categories, taught method is the most common even in Uganda because it is considered the best way to equip the students with the sufficient information.

Teaching research design to graduate students is critical to meet the expectation that students are to understand the scientific underpinnings of their specialisations and appropriate use of evidence that are essential for well-educated practitioners (Patricia F. Pearce *et al*, 2013). Postgraduate study certainly builds on the skills acquired at undergraduate degree level: time management, selfdiscipline and working to deadlines (Lauren Razavi, 2014)

Irrespective of the program offered at post graduate, students put much emphasis on research methods to fully understand all necessary steps required to produce a research report that that contributes to people and both natural artificial resources exist on earth. According to Patricia F. Pearce *et al*, 2013 use of the Arrow Framework enhances the student's ability to grasp sufficient research knowledge to critically evaluate research reports, develop their scholarly projects, and use the information adeptly in practice.

University of Groningen, 2014 identified a number of contributions of Post graduate education to the members who accomplished the postgraduate programs i.e.; acquiring knowledge at a higher level than what one studied during bachelor's degree, development of the necessary skills for their field of work, securing a good graduate job is more likely, and the possibility of attracting a higher salary is increased, feeling confident that the time and money invested in postgraduate education was worth it and development of professional network which creates valuable insights into working environment.

CONTENT OF RESEARCH METHODS

As any other course unit, research methods covers a number of chapters which are taught to scholars in preparation for developing their own research reports. The course unit majorly covers topics such as; types of research, approaches of conducting research, reporting and Communication of Research, types of research projects and research processes.

TYPES OF RESEARCH

Basic/Fundamental research (or pure research): This is conducted for the purpose of acquiring knowledge. It involves seeking knowledge without thought of application, e.g. Science. ***Applied***

research: This is intended to bring about some direct benefit to humankind. It involves seeking knowledge which can be applied to achieve a certain goal e.g. Technology

Practical Research: This type of research seeking knowledge of dynamic action in process of application, e.g. engineering.

Descriptive Research: It describe what is happening behaviorally. For example students failure at undergraduate, prevalence rate of HIV infection in the community, among others. This research does not explain how or why.

Relational (Correlational) Research: This is the measure and estimate relationship between two or more variables and does not demonstrate causality, for example learning aids and student knowledge

Experimental Research: This research manipulates conditions responsible for effect and it implies causation, for example: Presence of books on student learning.

APPROACHES OF CONDUCTING RESEARCH

Quantitative: This research approach generates numerical data (numbers), formal experiments, and standardized instruments/scales (surveys/questionnaires). The approach typically has large sample sizes, Often entails hypothesis testing and generalizability.

Qualitative: This research approach generates categorized information and/or impressions or descriptions, and its concern is with process, not merely outcomes. The qualitative approach is less structured with typically small sample sizes and provides extensive detail on attitudes and behavior. Examples include; a case study, focus group, in-depth interview, naturalistic observation, among others.

Mixed Methods (Multi-method): This kind of approach is a combination of quantitative and qualitative methods, where one specific method may be used to strengthen another method. Examples of this approach include: focus group used to support survey results or a structured job satisfaction survey developed by conducting one- on-one interviews with employees.

In order to illustrate the range of research designs, as well as distinct differences in research paradigms and the relationships of the designs to each other, a graphic in the form of an arrow was created as the visual frame-work which serves as the foundation for representing research paradigms, and then superimposing additional information, building the detail and complexity of research methods and presents information in a manner that supports both teaching and learning a new research language (Patricia F. Pearce, 2013). The arrow frame work is illustrated in the figure below;

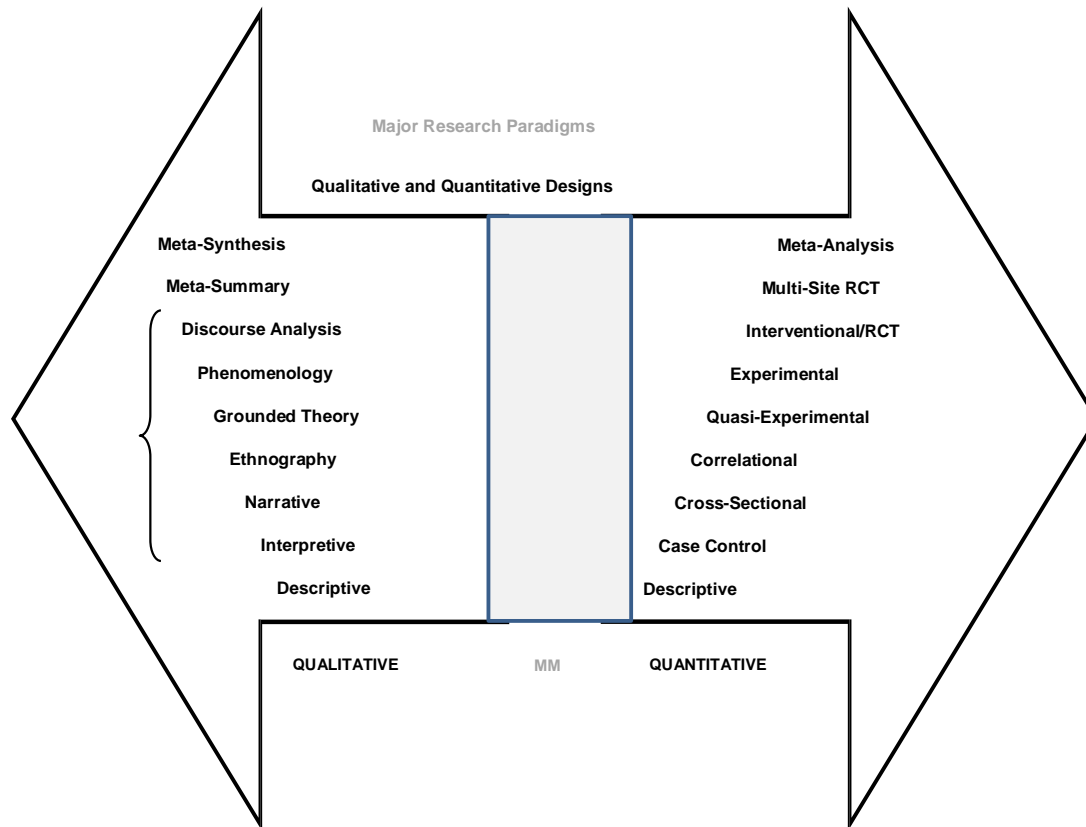


Figure 2: Major research designs by paradigm, emphasizing qualitative and quantitative. Source: Patricia F. Pearce *et al*, 2013

Scientific method: this research method consists of procedures i.e. systematic observation, measurement and experiment, formulation, testing and modification of hypotheses. The procedures are achieved through a successive steps which vary from defining a question, gathering information and resources (observe), forming an explanatory hypothesis (formulate questions) , testing the hypothesis by performing an experiment and collecting data in a reproducible manner (Method/Measurement), analyzing the data (Result), interpreting the data and draw conclusions that serve as a starting point for new hypothesis (Conclusion), Publishing the results and then finally Retesting to confirm the results (frequently done by other scientists)

SCIENTIFIC METHOD OF HANDLING RESEARCH



Reporting and Communication of Research

The working research group/ individuals are always required to communicate to people or organisations who fund, interested in further utilization, benefit or evaluate their research work.

TYPES OF RESEARCH PROJECTS

Designed experiments: e.g. laboratory or field research where the researcher imposes the treatments in a (semi-) controlled situation.

Systematic observations: e.g. resource survey or community meetings, where the researcher makes measurements or observations according to a plan but without complete control of the process

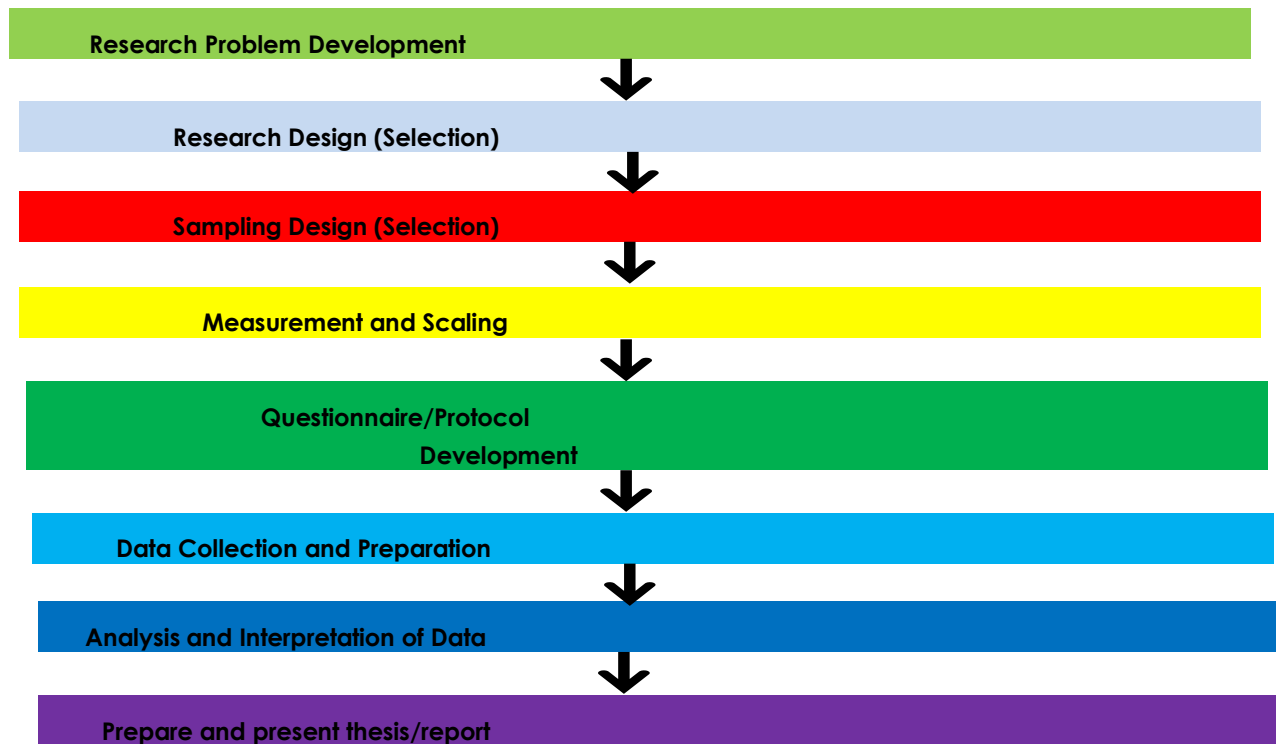
Synthesis: where the researcher imposes a new conceptual framework on previous data and establishes that this is a better or more unifying explanation;

System design: where the researcher designs a system and shows that it is better in some sense than previous designs; this includes design of algorithms and methods.

Research processes

Research development is developed step by step via a series of processes. The processes involve; identifying a research topic (question), formulating a research plan, literature review I, constructing a hypothesis, identifying variables, literature review II, establishing a conceptual/ theoretical framework, creating a research design, identifying instruments for data collection, writing a research proposal, collecting data, arriving at conclusions and writing a report.

Research processes



BENEFITS OF RESEARCH METHODS TO STUDENTS

Research methods train students in such a way that they are able to easily find out the truth which is hidden and which has not been discovered as yet. It Provides students with first-hand experience of undertaking research in real world contexts or using authentic empirical data which constitutes a second and related pedagogical approach within the literature (Daniel Kilburn *et al*, 2014)

It helps students to develop reasoning skills that guides them in the applicability of information to their current position or intended profession. Students are able to differentiate between science and pseudoscience and hence able to challenge and find limitations in research claims. The course teaches students how to write a proposal, engage in independent studies, work collaboratively with a mentor-mentee relationship and the curriculum is sequential in helping students to identify a study topic, formulate inquiry questions, organize a literature review, and select appropriate research designs and methodologies (Dr. Richard Andalon, 2012)

Descriptive studies in research methods advances the students' knowledge in such a way that they can perfectly portray accurately the characteristics of a particular individual, situation or group. By testing a hypothesis of a causal relationship between variable, students are also able to determine the frequency with which something occurs or with which it is associated with something else through diagnostic research studies.

Students understand better on how to study problems both natural and man-made in detail, relate to history by reviewing literature and then come up with the best options to overcome the problems in a manner that benefits communities both at individual and national level. In this process students get esteem at the same time enjoy the challenges of solving unsolved problems while doing innovative and creative things that have meaningful and long-lasting contributions. Other benefits include attaining high level of understanding of fundamental concepts as well as practical significance, degrees, financial benefits, and even respect which comes along the way.

Attaining the knowledge of research methods especially to postgraduate students who may be at the same time employed, is as well beneficial to their employer organisations in such a way that the attained knowledge of research development once applied in their areas of specialisation, the organisations achieve fast progression and equitable service delivery. Jane Artess Charlie, 2014 also argued that the specialist higher level skills developed through postgraduate study can bring a range of benefits, both to individuals in their employment and career prospects, but also to employers and the wider economy, particularly as knowledge and higher skills continue to be vital for many areas of growth

Research methods course is equally important to university educators /facilitators by advancing their teaching skills and further develop their professionals through supervising research theses developed by their students. Lecturers at PHD level are upgraded to the level of professor in case they have published required books and supervised research works for PHD, master's and bachelor's students.

CHALLENGES TO TEACHING RESEARCH METHODS

Much as research methods has been to prove to be essential to students, educators and the world at large, a number of gaps still exists that limit some universities from adopting it or sometimes don't give it a first priority, some challenges are given below;

Teachers and researchers struggle to keep up with the changing knowledge representations and new forms of information access and dissemination, virtual realities, and how these might affect what and how students learn (M.J. Cox, 2012). Research methods teaching tools such as published textbooks, demonstration equipment, web resources among others are available almost everywhere, but these sources still do not fully bring out sufficient knowledge that is helpful to produce reliable research.

Hammersley, 2012 explained that the tacit knowledge associated with certain aspects of research practice cannot be taught in abstraction, which becomes a big problem to teachers. Furthermore,

transferring the required tacit knowledge, through exercises and mini projects (Galliers, R. D. and Huang, J. C. 2012) is still a sound problem.

According to Sarah Lewthwaite and Melanie Nind, 2016, recent debate around the teaching of quantitative methods exposes the lack of connection between the teaching and educational research and theory. Also understanding research language such as dependent and independent variables, validity and reliability, level of evidence, and causality is one barrier that has been well documented in the literature because it produces glazed looks or silence from students (Kelly, Turner, Gabel Speroni, McLaughlin, & Guzzetta, 2013).

RECOMMENDATIONS

A system for sharing research topics among students from developed countries and those from developing countries is considered relevant in solving the existing challenges of research methods courses and elevate the course to the higher standard. This will ensure tackling and exhaustion of overwhelming problems in developing countries like Uganda since students in developing countries where most of the problems have been researched on and handled, will be able to work hand in hand with students in developing countries where the environment is still virgin. The students from developing countries will also use the opportunity to advance their knowledge of research to that of students in developed countries. The research supervisors from both developing and developed countries will also enhance their professionals through sharing ideas amongst themselves.

A proposed system for sharing research topics has been developed as illustrated in the figure below;

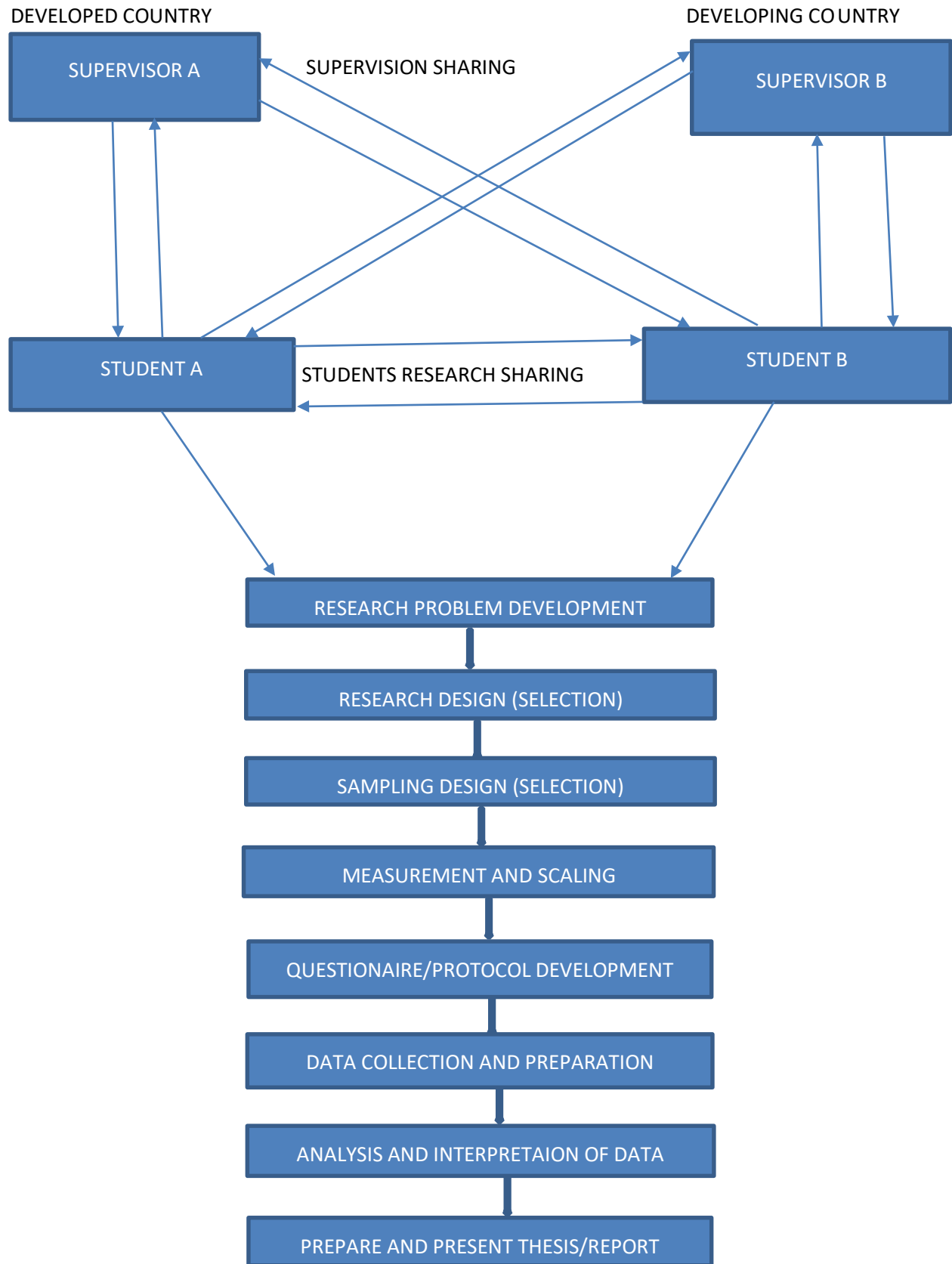


Figure: A proposed system for sharing research topics.

CONCLUSIONS

Research methods course is very essential to students at under and postgraduate students, educators/lecturers, universities, organizations that employ these students and the world at large. Students through research methods are equipped with knowledge that advance their skills towards development of their careers, lecturers also improve on their professional knowledge and careers, and these groups of people are considered very reliable assents in problem identification and management everywhere across the globe.

On completion of their programs after successfully conducting their research courses, the candidates become fresh researchers in position to recognize knowledge gaps in existing situations and even develop a solution to the identified gap. With time they progress their skills and advance into great researchers who are world problem solvers. The knowledge obtained is also beneficial to the candidates in case of further studies. The candidates also stand a better chance in the job market.

A number of challenges that limit research methods progression in some universities are linked to difficulty for educators and researchers to understand some research language, failure of lecturers and researchers to keep up with the changing knowledge representations and new forms of information access and dissemination, difficult for tacit knowledge associated with certain aspects of research practice to be taught in abstraction, lack of connection between the teaching and educational research and theory, among others.

Arrow Framework For teaching and learning research design has been demonstrated to be effective and practical as a model for teaching research methods to students at all levels above secondary since it provides a conceptual and practical pedagogical approach to provide students with a model for understanding the varying aspects of research methods and helps students understand the language of research (Patricia F. Pearce *et al*, 2013).

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