

**TYPES OF INTELLIGENCE, PERSONALITY TYPES AND THEIR
RELATIONSHIP WITH GENDER AND CAREER CHOICE AMONG FIRST YEAR
UNDERGRADUATE STUDENTS IN A SELECTED PUBLIC UNIVERSITY, KENYA**

**BY
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**A THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY IN GUIDANCE AND COUNSELING**

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DECLARATION

Declaration by Candidate

This Thesis is my original work and has not been presented for a degree in any other
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DEDICATION

This thesis is dedicated to my parents, the late Joseph Fabianus Atela *Wuod Nyar* Maseno and Susana Aomo *Nyar Odawo*; to my parents-in-law Dafton Mwisege and Christina Mwisege (*Anguo*) and to the wellbeing of their granddaughters Mel, Mitch, Tash, Tecky and Lailah

ABSTRACT

Training institutions all over the world place high premium on those who excel in examinations. In Kenya, students are admitted into available undergraduate degree programmes based on their performance in Kenya Certificate of Secondary Education examination. Moreover, university admission requires that students should obtain a minimum grade of C+ which has been an impediment for a majority of students in choosing a career. Therefore, a substantial number of first year students end up revising their courses or settle for what is available, and this may lead to low career satisfaction levels being witnessed today. Moreover, limited research attention has been given to the importance of considering students' unique intelligences and personality interests when placing them in the degree programmes. Therefore, the specific objectives of this study therefore were to establish types of intelligence among first-year undergraduate students across gender; to establish personality types across gender; to establish types of intelligence across career choice and to establish personality types across career choice. The study was guided by the Multiple Intelligence Theory (1983) and Holland's Code Theory (1997). Ex-post facto and descriptive survey designs were adopted for the study. The study population was 490 first-years B.Ed students during the 2016/2017 academic year. The study sample consisted of 220 students selected through proportionate stratified sampling. Data were collected using modified Gardner's multiple intelligence and Holland Questionnaire, Interview Schedule and Document Analysis Guide. The questionnaire was piloted using 10% of the study population. Research instruments were screened for content validity. Test-retest reliability indicated that the questionnaire was reliable ($r=0.84$). Qualitative data were transcribed and emerging themes reported. Quantitative data were analyzed using frequency counts and percentages. The study found that respondents can be classified into the nine intelligence types with interpersonal intelligence ($n=34$; 15.5%) being the dominant type followed by verbal linguistic intelligence ($n=32$, 14.5%). The least dominant was visual spatial ($n=16$; 7.3%). Males dominated in all types of intelligence except interpersonal, visual-linguistic and bodily-kinesthetic. The dominant personality type was social ($n=40$; 18.2%) with more males ($n=24$, 60%) possessing social personality type than females. The least was realistic type ($n=30$; 13.6%). Males outnumbered females in all personality types except artistic personality type where females were dominant. It was concluded that differences exist in specific types of intelligence and personality types across gender and career choice. The study recommends the findings for student appraisal to aid placement process, career guidance practices, knowledge and further research.

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LIST OF ABBREVIATIONS AND ACRONYMS

B. Ed	Bachelor of Education
G.O.K	Government of Kenya
I.Q	Intelligent Quotient
JAB	Joint Admissions Board
K.C.S.E	Kenya Certificate of Secondary Education
KUCCPS	Kenya Universities Colleges Central Placement Services
MIDAS	Multiple Intelligence Development Assessment Scales
MI	Multiple Intelligence
RIASEC	Realistic, Investigative, Artistic, Social, Enterprising, Conventional
SDS	Self Directed Search
SPSS	Statistical Package for Social Science

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Academic result is the main tool that is used to promote learners at all levels of education in most parts of the world. Moreover, it is a means of placing students in broad superficial intelligent-quotient (I.Q) based career training groups. Students have learnt at very early age to sort themselves into these careers groups by observing other students labeled intelligent in through academic examinations (Shearer, 2006). However, many students in public universities remain dissatisfied or disillusioned with their career choice (Organization for Economic Corporation Development - OECD, 2004).

Training institutions in most parts of the world place high premium on those who excel in examinations based on scholastic intelligence. While many academic universities are doing more teaching than career vocational training of students, this may be contributing to student attrition by being reluctant to recognize their students' vocational aspirations but laying more emphasis on students' intellectual development. Thus students with multiple intelligences and personality types present a challenge to universities that wish to maintain high academic standards and also serve students' career needs.

This is because universities cannot be expected to make students what they are not particularly when they fail to recognize and guide the innate abilities and interests of all their students (Shearer, 2006). Furthermore, higher education and non-secondary education, the emphasis is only on two intelligences: linguistic/verbal and logical/mathematical (Morgan, 2016; Tsai, 2016). The result of the IQ test relies almost entirely on these two main intelligences which dictate the academic ability of learners.

The establishment of a vocational identity in form of clear and stable picture of one's abilities and interests is critical in the prevention of vocational crisis. Therefore if the academic environment of a university is to reward certain patterns of students' abilities and interests, it's imperative that students are admitted into degree programmes that are compatible with their types of intelligence and personalities. This is so because many programmes offered at the universities probably have a strong bearing on types of intelligence and personality interests.

Intelligence has been defined in varied ways by scholars. For instance, Cohen (2012) defines intelligence as “the capacity of an individual to act purposefully, think logically and deal with the environment” (p.15). Howard Gardner (1983) challenged the traditional theory that there is only single intelligence. Yavich and Rotnitsky (2020) argued that Gardner does not deny the existence of IQ, but questions its importance outside a relatively narrow and limited school system.

The traditional theory on intelligence provides for a single intelligence for all people based on various educational aspects of school. If a person failed an IQ test, then they would be deemed unintelligent by traditional theory standards. Students are regularly assessed to figure out their strongest and weakest intelligences. However, other factors that must be considered when creating assessments, such as benefits to students learning, cultural background of students, and how interesting and engaging the activities are (Marens, 2020)

Several theories have been brought forth to explain intelligence (Sternberg, 2003). However Gardner broadened the concept of intelligence and formulated a unitary theory on types of intelligence called Multiple Intelligence (MI) (1983) theory which emphasizes “types of intelligence which are autonomous but interactive. It is a theory based on different types of intelligence namely linguistic/verbal, mathematical/logical, bodily/kinesthetic, musical, spatial/visual, naturalistic, interpersonal, intrapersonal, and existentialist”.

Gardner (1983) proposed nine types of intelligences of varying degrees possessed by human beings namely: mathematical/logical, linguistic/verbal, and bodily/kinesthetic visual/spatial, musical/rhythmic, interpersonal, intrapersonal, naturalist and existential. A person may have all the multiple intelligences mentioned or some of them with varying degrees” (Alghazo et al., 2009; Ozgen et al., 2011). For example, Eid and Alizh, (2004) assert that a person can have extra ordinary linguistic intelligence but low musical intelligence. Each type of intelligence is made up of specific skills. Gilman (2012) noted that a type of intelligence comprises a “set of specific skills that embody both convergent problem solving as well as divergent thinking abilities and has its own memory system with specific cerebral structures dedicated to processing its specific contents”.

In Kenya, intelligence has been largely associated with excellence during formative and summative examinations. However many IQ tests like KCSE have been found to be explore very narrow aspect of scholastic intelligence hence ignoring other unique human

intelligences. Scholastic intelligence refers to cognitive academic achievement acquired through formal education and measured by performance in examinations (paper and pencil test). By relying on examinations alone, these feelings, gifts, talents and experiences of student's are ignored (G.O.K, 2012).

The traditional psychometric measurements of intelligence utilized by universities have also been found to be limited. Talents, skills, abilities and interests are hardly tapped or boosted. According to Obora (2012) education remains a routine where students memorize tutor's notes and reproduce in foolscaps during examinations resulting in a collection of papers in form of certificates which have no correlation with innate talents and gifts of the candidate. According to Passadino (2021), by incorporating Gardner's theory of multiple intelligence into any curriculum, educators can take advantage of their student's strongest intelligences and allow them to learn in a safe learning environment.

The review of literature revealed no specific study based on Gardner's MI model (1983) to establish types of intelligence among undergraduate students in a public university in Kenya. Therefore, these types of intelligence may have largely remained untapped by public University education and research and probably widely unknown to most students. It was therefore important to establish the types of intelligence profiles among first year undergraduate students in a selected public university in Kenya.

Several studies have reported gender differences in specific cognitive abilities with some supporting females while others males (Hyde, 2005; Lin, 2009). Cooijmans (2013) asserted that "sex differences in mental abilities are caused by hormonal differences (estrogen / testosterone) balances which work partly prenatally and partly after puberty. Females are slightly better than males at straight forward arithmetic (not complex mathematics)" (p. 34). Further, Cooijman (2013) found that males are better than females "in spatial ability, mental manipulation of figures in two or more dimensions".

Although the above studies are significant to this study as they revealed gender differences in limited types of intelligence. Cooijmans, (2011) focused mainly on logical mathematical, linguistic, spatial and bodily-kinesthetic and no other significant MI profiles like intrapersonal and naturalistic. Studies by Tirri and Nokelainen, (2008) focused on preadolescents only in non-African populations hence was demographically limited.

Therefore the focus of this study was to establish nine types of multiple intelligence across gender in a selected public university in Kenya.

According to (PASD 2012, p. 15), “personality is a dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations and behaviours in various situations” (p. 15). Ryckman, (2004) and Hossain (2023) reviewed several models and approaches to provide tools for understanding personality. However, psychologist John Holland (1997) developed the Holland Codes theory of vocational personality types which describes personality type’s vis-à-vis occupational interests. Holland (1997) used the term typologies (RIASEC) to assign a code to the six personality types namely: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. People have distinctive combinations of these types although most people can be described by a single most pivotal type with others providing a moderating influence on behaviour and preferences.

Holland’s basic structure (quasi-circumplex) is invariant across gender although the distances between dimensions vary in different samples. According to Wais et al. (2007) women tend to be of Artistic and Social types unlike men who tend to be Investigative and Realistic. They note that males have higher self efficacy therefore they are likely to be Realistic, Investigative, Enterprising and Conventional in nature. Kniveton (2009) reported that males placed realistic type top of their list while Artistic type ranked highly in the females’ list. Whereas, Holland’s personality code theory has generated a lot of interest in research and practice in the Western world, apparently limited studies seem to have been done among first year undergraduate students in a public university in Kenya.

The comparative study by Glaser et al. (2003) demographically focused on adjudicated male youth only; Green’s (2010) action research focused on female fashion students only hence was demographically limited. In Nigeria, Onoyase and Onoyase’s (2009) did not address relationship with gender. In Kenya Chemeli (2013), Migunde (2011) focused on form four students while Gitonga (2012) focused on third year university students. To fill this gap, this correlation study employed Holland’s theory to establish the personality types across gender among the first-year undergraduate students in a selected public University in Kenya.

Armstrong (2009) suggested that “the multiple domains of intellectual abilities have unique skills channeled to specific occupations”. Further vocational subjects like fine art, “theatre

arts and related occupations have sometimes been denigrated because the spatial, kinesthetic and other intelligences needed in these areas have not been recognized” (Woods & Hampston, 2010). Accordingly, the old “field leader of a sports team might not require a particular high I.Q especially if he or she is a talented athlete, experienced and knowledgeable of the sports” (Reggio et al., 2002). According to Lenaghan (as cited in Shiruffudin, 2010), the interpersonal intelligence type is characterized by teaching, public speaking and leading. The proponents of existentialist intelligence include “the scientist Einstein and early philosophers like Aristotle, Confucius, Plato, and Socrates” (Wilson, 2012). Wambugu (2010) asserts that some information technology professionals give a lot of attention to communication skills because they share their ideas visually and use flowcharts, blueprints, satellite images, and schematics.

There has been a growing interest in the application of multiple intelligence theories in the educational settings. Many studies like Shearer, 2006), Shearer (2009), (Green (2010), Shiruffudin, (2010), Ozgen, et al. (2011) and Wilson, (2012), which focused on specific multiple intelligences among the Europeans and Asian populations. More so, test like KCSE tend to focus on one but narrow aspect of scholastic intelligence to categorize students and as a transition tool to higher public universities based purely academic achievement. Holistic human intelligence therefore cannot be measured using a single test or examination.

The B. Ed programmes offered at a public university may have a strong bearing on different types of intelligence and personality and not every student admitted into these programmes can fit in them. Apparently no attention has been given to exploring multiple intelligence among students at any level of education system where career decision making is critical. It was therefore important to establish the types of intelligence across career choice among first year undergraduate students in a selected public university in Kenya.

The Holland codes can reflect both the individual and the occupation that is most congruent (Hollandcodes.com, 2012; Toomey, et al., 2009). Holland (1997, p. 76) further argues that “people with specific vocational personality types are attracted to activities and occupations associated with those types. For example Investigative personality type on the other hand, is drawn to scientific and mathematical occupations, for example a scientist working in a laboratory. Social personality type is suited for social or interpersonal occupations such as teaching (Hollandcodes.com, 2012; Career Key, 2023).

According to United States of America Department of Education (NCES, 2010), only 36% of students graduated in four years and about 40% dropped out. In addition, Allen and Robbin (2010) summed up that the cost of dropping out, changing courses and not graduating in time is exorbitant as one may be required to part with two thousand dollars. Other students, according to Green (2010), choose a different career path because they lack insight about career choice that reflects their talents and interests. In Nigeria, for instance, many youths are unsuited for their careers as they find themselves in jobs that do not satisfy their interests (Issa & Nwalo, 2008).

In Kenya, Obora (2012) reported that many students choose careers that eventually lead them to employment opportunities that they are not interested in. This points to inadequate career appraisal tools place a person in career choice that suits their personality interests. Whereas Gitonga's (2012) study focused on personality types and career choice, the study population were third year students who had settled in their degree choice and harmonized their interests to training activities and environment unlike the first year students under the current study who had just been placed in a degree programme and were probably facing turbulence and with little knowledge on match between their personality interests and career choice.

Career choice is a process of selecting a suitable career. A good career decision "is characterized by a match between a student's career aspirations, interest, clarity of the nature of work and type of training required" (Gitonga, 2012; Kemboi et. al., 2016). For the purpose of this study, career choice refers to the B.Ed degree programmes offered at the School of Education at the university in Kenya. A B.Ed programme, which is an honors degree course in education, enables students to train for both academic and professional field.

In Kenya, reforms in the education sector have led to increased number of students enrolling in public universities. However, many students in public universities remain dissatisfied or disillusioned with their career choice. (Gitonga, 2012; Muigai, 2007). According to UNESCO (as cited by Wagah et al., (2010) "education systems in Africa are too theoretical and academic, disregarding practical aspects that would prepare youth for productive careers". Students are admitted into available undergraduate degree programmes in universities based on their performances in KCSE. The minimum students' admission grade in public universities is C+. In most cases, students who fail to attain the required points for a given degree programme during the first selection are required to make a second one based on

courses available. The second selection process is used to allocate degree programmes available (Kemboi et al., 2016).

This means that a student may be allocated a degree programme he/she did not intend to pursue in the initial stage of selection (Gitonga, 2012). There is also the possibility that students are placed in careers that are not in line with their intelligence and personality types. Therefore, “many students end up settling for what is available rather than pursuing the courses of their choice, inner wish or what society perceives to be glamorous or attractive” (Muindi, 2011; Gallup Africa International, 2012). This accounts for the current low career satisfaction levels of 7% in colleges.

Gallup (2012) reported that about 85% of students in public universities are not studying degrees of their choice and interests despite scoring well in KCSE while 96.1% are not allocated courses of their choice. Data from the Joint Admission Board (JAB), Kenya indicate that more than five thousand candidates who sat KCSE failed to fit in any of their degree choice. As suggested by Gudo (2012), there is need to consider the attributes of the students during the admission process. According to Morgan (2016) and Wilson, (2018), intelligences are expressed by learners’ functioning, learning outcomes and not only by exam results.

According to Kalambuka (2010), “learning institutions now operate in a Darwinian like manner where only those students who are ‘fit’ survive while those that are not, flounder”. Samora (2010) noted that “a learning environment that discriminates against a group of students puts the disadvantaged ones in a precarious situation with numerous challenges like trying to change courses midway, repeating, taking too long to complete courses and dropping out altogether” One reason for this trend, according to Morgan, (2016) involves the overuse of standardized tests by teachers to evaluate students in schools. At the start of the 21st century, for example, schools began to rely more on these tests to evaluate students, leading many teachers to use a style of teaching that focuses on memorization. Interestingly, Gallup (2012) reported majority of students were dissatisfied with their career choice. Similarly, the G.O.K (2012) found that most teacher trainees do not have teaching as a first choice at all levels of teacher training and recommended the vetting of all trainees to establish their interests to teaching as career. It was recommended that, KCSE applicants joining teacher training colleges should indicate their interests and motivation. Njoroge (2017) asserted that a “large percentage of graduates are believed to be unfit for teaching jobs”.

This has provided a significant gap since the current study which assumed that the B.Ed programmes are the ultimate career choice of the first year undergraduate students.

1.2 Statement of the Problem

Academic result is the main tool that is used to promote learners at all levels of education in most parts of the world. In Kenya, students who attain a minimum grade of C+ (C Plus) in KCSE) are admitted into available B.Ed degree programmes in public universities. Yet, academic qualification, being the only considered factor in placement remains an impediment to 79.4% of students when making a career choice. In most cases, students who fail to attain the required points and clusters for a given degree programme during the first selection are required to make a second one based on courses available. There is a possibility that a student is placed in a programme he/she did not intend to pursue. Available data shows that about 96.1% were not allocated courses of their choice and 85% of students were not studying degrees of their interests despite scoring well in KCSE. With limited self-knowledge and congruent career opportunities at the university, students' end up in degree programmes which may not have a correlation with their innate intelligences and personality types hence the low (7%) career satisfaction levels. The B. Ed programmes offered at a public university may have a strong bearing on different types of intelligence and personality and not every student admitted into these programmes can fit in them. There is no documented evidence of personality and intelligence assessment administered to students to inform their placement in a degree programme that suits their interests and unique abilities other than KCSE which assess a narrow scholastic cognitive ability. It therefore becomes important to explore the across gender, students' types of intelligence, personality interests across career choice. The study therefore sought to establish the types of intelligence, personality types, intelligence and personality types across career choice among first year undergraduate students based on an eclectic model of Gardner's (1993) multiple intelligence and Holland's vocational personality (1983) theories.

1.3 Purpose of the Study

The purpose of the study was to establish Gardner's (1983) types of intelligence, Holland's (1997) personality types and their relationship with gender and career choice among undergraduate students in a selected public university in Kenya.

1.4 Objectives of the Study

Specifically, the study sought to;

- i. Establish types of intelligence among first-year undergraduate students in the Bachelor of Education degree programmes in a selected public university in Kenya.
- ii. Establish the types of intelligence across gender among first-year undergraduate students in the Bachelor of Education degree programmes.
- iii. Establish the personality types across gender among first-year undergraduate students in the Bachelor of Education degree programmes.
- iv. Establish the types of intelligence across career choice among first-year undergraduate students in the Bachelor of Education degree programmes.
- v. Establish the personality types across career choice in the Bachelor of Education degree programmes.

1.5 Research Questions

The study was guided by the following research questions;

- i. What are the types of intelligence among first-year undergraduate students in the Bachelor of Education degree programmes in a selected public university?
- ii. What are the types of intelligence among male and female first-year undergraduate students in the Bachelor of Education degree programmes?
- iii. What are the personality types among male and female first-year undergraduate students in the Bachelor of Education degree programmes?
- iv. How are the types of intelligence distributed across career choice of first-year undergraduate students in the Bachelor of Education degree programmes?
- v. How the personality types are distributed across career choice in Bachelor of Education degree programmes?

1.6 Assumptions of the Study

- i. It is assumed that the B.Ed programmes being pursued by the undergraduate students are their ultimate career choice.
- ii. It is assumed that first year B.Ed students of in the public university possess overlapping types of intelligence and personality types.
- iii. It is assumed that the respondents objectively and honestly responded to the questionnaire.

1.7 Scope of the Study

The study was conducted in one public university in Kenya. The university was purposively selected due to typical similar nature of public universities in Kenya hence was chosen to act as a proxy to other public universities in Kenya. Diverse student populations from across the country are enrolled in the university giving it a multicultural student population.

The target populations were first -year B.Ed students in one selected public university and therefore the sample did not include students in other academic years, programmes or other public universities. The student population at the selected public university was similar to all other public universities in that majority of them are admitted by centrally by the government placement agency and the data generated would act as a proxy to the population in other public universities.

The study covered the five B.Ed. programmes (B.Ed-Arts with IT, B.Ed-Science with IT, B.Ed-Special Needs with IT, B.Ed- Early Childhood development and Education with IT, B.Ed- French with IT) offered in the School of Education. The B.Ed programmes were purposively selected because of similarity with B.Ed programmes in public universities in terms of curriculum design and expected outcomes. The B.Ed. programmes were included in the scope of the study because of their strong bearing on different types of intelligence and personality-vocational types as reflected in the in the B.Ed. programmes cohorts. Moreover, the B.Ed. training programme is highly scholastic and students may be unaware of these taps into their types of intelligence and personality. The Lastly, B.Ed. students are a representative group in all disciplines be it sciences, humanities or languages.

1.8 Limitation of the Study

Due to the similarity of public universities, the B.Ed programmes and students in Kenyan public universities, the study was limited to only one selected public university. It was not also possible to include the opinion of institutions involved in student admissions into universities due to the predetermined overall criteria of placement based on KCSE modal grade and cluster points.

Data on multiple intelligences, personality types and career choice was collected via a questionnaire hence student's choice were limited. The cross-sectional data collection was another limiting factor as the researcher was forced to focus on selected samples only. Further, it was practically impossible to get all the respondents in a single assembly, hence

simple stratified random sampling ensured that only the willing respondents participated in the study. This also guarded against selecting a respondent twice.

Due to the large number of degree programmes and would-be data analysis extremities and duplicity, the target population was restricted to B.Ed first-year students only. Further, cohorts were difficult to isolate due to confounding variables like similarity in subject choice and common units. The large population of respondents (B.Ed Arts and B.Ed-Science students) may have obscured important individual and subgroup differences for groups with low enrolments like B.Ed-French. The integration of regular and self-sponsored students posed a daunting limitation to administration of instruments as it was difficult to decipher the motives of the career choice of any individual respondent.

The variables under study namely: intelligence, personality types are fairly sensitive and intimate issues. Moreover, the researcher had no control over the students' learning experiences and lifestyle hence may not have been able to gauge response biases and levels of honesty.

1.9 Significance of the Study

The findings may hopefully help students in adequately appraising themselves and match their specific unique skills to career choice. The career correlation guidelines could be used to develop a mechanism applicable for placement into the university as well as revising for courses.

The findings on the type and nature of relationship between types of intelligence, personality types and degree programmes in which students are admitted may provide opportunities for universities' faculty and academic advisors to examine admissions criteria, guide students in identifying their college major, training, evaluation and placement hence career choice satisfaction and success in course of study.

The findings will hopefully help universities' to examine course criteria, training and evaluation and retention efforts as universities would be able to understand the needs and talents of their students. Although the study used B.Ed students in a public university as respondents, the findings of this study will inform other undergraduate students in other degree programmes and private universities. Finally, it is hoped that the research findings would contribute to the existing knowledge in the field of intelligence, personality types and career guidance services, training as well as prompt further research.

1.10 Theoretical Framework

This study employed an eclectic theoretical framework while remaining theoretically consistent based on Gardner's (1983) Multiple Intelligence (MI) Theory and Holland's Code Theory (1997). These theories share overlapping similarities in representation and undergraduate students can employ them to make connections with their career choice. (Green, 2010; Gottfredson & Duffy, 2008; Lulgjural & Cooley 2006; Shearer, 2006). The theories combine several constructs of personality psychology, including behavioral engineering, cognitive and social psychology, including theories of self-perception and social stereotypes (Zainudin, 2020). Furthermore, Shearer (2009) reported that the theories showed a pattern of correlations between MI and Holland's codes using MIDAS and SDS scales for example, Musical and artistic intelligence ($r = .52$). The basic premise in this eclectic approach is that career choice in a public university should be a way of expressing an individual's multiple abilities and interests and not a single examination.

In this study, Gardner's (1983) theory has been chosen because it is more unitary and culture-sensitive in the grouping of intelligence as compared to two-factor by Spearman (1863-1945) and triachic theory (Sternberg, 1985). The basic tenets of multiple intelligence theory include inclusive and personalized approach, human potential, abilities and strengths, self awareness and self esteem, problem solving, product creation, culture sensitivity, learning style and unique aptitude set capabilities and competencies. Gardner (1983) theory was based on different types of intelligence namely linguistic/verbal, mathematical/logical, bodily/kinesthetic, musical, spatial/visual, naturalistic, interpersonal, intrapersonal, and existentialist.

Each type of intelligence must have an identifiable core operation or set of operations in the context of the environment. Each person may possess all intelligences in ways unique to each person in high, modest or relatively developed ways. Equally everyone has capacity to develop all the intelligences to reasonable levels given appropriate encouragement and instruction. Inclusive and personalized approach refers to values with diverse strengths but interactive abilities. This approach helps individuals to recognize and develop unique mix of intelligences regardless of whether they are aligning with traditional society expectation. Human potential refers range of abilities not focusing on academic achievement. This human potential is innate, measurable and difficult to change. People have unique blend of capabilities, skills and strengths to solve a problem, create a product or perform a function

considered valuable in one or more culture hence boosts self-awareness and esteem. This is the potential that one kind of standardized test cannot measure (Morgan, 2021).

Gardner (2000) further portends that every person is differently “smart” hence embrace unique styles which they use in their daily lives. According to Shearer (1999) students who have completed Multiple Intelligence Development Assessment Scale (MIDAS) were found to have a clearer sense of their skills and abilities and coupled with learning style, one can create product to solving problems acceptable in one or more culture setting. The MIDAS brings to perspective unique human potentials which drive individuals to congruent careers which can then be demonstrated in complex ways or within each category.

Therefore, successful behaviour in an educational setting largely depends on dominant skills and abilities in a student and the corresponding activities in a university academic environment which motivates or promotes a learning style. Hence, a “student with multiple intelligence will seek an academic programme and courses congruent to his/her unique types” (Johnson, 2007, p.65). Ways in which multiple intelligences are expressed among learners depend on students’ factors such as cultural background, social and cultural environment. For example a musician who cannot play an instrument but is a good song composer. A combination of the intelligences in action is noticeable when combined together in daily actions and in real life (Bordei, 2018). For example, the musically intelligent student will pursue a course to hone his/her music skills like playing musical instruments, singing, recognizing tonal patterns, remembering melodies, composing music and understanding the structure and rhythm of music. A bodily - kinesthetic Intelligence student will pursue programmes such as physical education and fine arts whereas a student with logical - mathematical intelligence uses reason, logic, numbers, intense questioning and experimentations in sciences, mathematics and problem solving. For instance, graph designing involves both spatial and logical-mathematical intelligence, playing the piano requires the use of not only musical intelligence, but kinetic, intrapersonal and interpersonal intelligences (Bordei, 2018).

Therefore, students training to be mathematicians or physicists spend years sharpening their mathematical intelligence in a distinctive and logically relevant way. According to Kerka (2012), “young adults with visual-spatial intelligence skills may be fascinated with mazes, jigsaw puzzle buildings, reading, writing, understanding charts and graphs, a good sense of direction, sketching, painting, drawing, and creating visual metaphors and analogies,

manipulating images, constructing, designing practical objects and interpreting visual images” (p. 13). Teacher-trainees and history students need 3-D modeling and visualization to recreate historic characters while geography, physics and chemistry teachers can make these subjects interesting when teaching concepts like gravitational force and pressure using 3-D animation (Kariuki, 2011).

Naturalist intelligence includes love for nature for example, university botanical gardens, environment friendly courses like geography, zoology, botany. In a university academic environment, a student with existentialist and intrapersonal intelligences portrays understanding, self-reasoning and knows his/her role in a relationship with others. Such students also excel in courses like research, philosophy and psychology. Yazdanimoghaddam and Khoshroodi (2010) found that linguistic and musical intelligence are the two main predictors of teacher efficacy. Students training in B.Ed programmes require to train in utilizing bodily-kinesthetic intelligence to build effective communication with their future students. According to Saeedi et al. (2012); Yazdanimoghaddam and Khoshroodi, (2010) a sitting or stationary teacher runs the risk of putting students to sleep as opposed to a teacher who makes the right body movements at the right time. In a recent interview, Hunter (2012) reported that Gardner expressed the importance of using students’ strong areas when introducing them to topics in the traditional curriculum. Teachers who avoid proceeding this way as they focus primarily on pupils’ weak areas increase the chances for students to develop low self-esteem (Hunter, 2021). It is crucial to allow students to develop the areas in which they are talented. According to Hunter (2021), Gardner used physics to show how providing instruction through the intelligences commonly ignored may be achieved by teaching this subject using a method other than one focusing on a textbook. For example, students could understand physics topics through their bodily intelligence.

In this study, Holland’s (1997) theory has been chosen because it is more inclusive in personality grouping compared to traits theories of Allport (1897-1967) and Catell (1905). According to Nistal et al., (2019) career choice theory developed by John L. Holland is the most widely applied career development theory in determining one's career. Much of the empirical research on career and personality has employed the RIASEC model of personality (Kennelly et al 2018). According to Hossain (2023) the model is stable, reliable, valid, and universal. The RIASEC model has shown stability across cultures based on comparisons of

information acquired from various nations. The model claim to be comprehensive, as evidenced by meaningful convergence among other main personality structures.

To identify the corresponding personality type and academic environment, the Dictionary of Holland Occupational Codes gives the qualitative data as shown by Gottfredson and Holland (1997; Gottfredson & Duffy (2008). Holland (1997 used a hexagon that reflects the varied vocational personality types as shown in Figure 1.1.

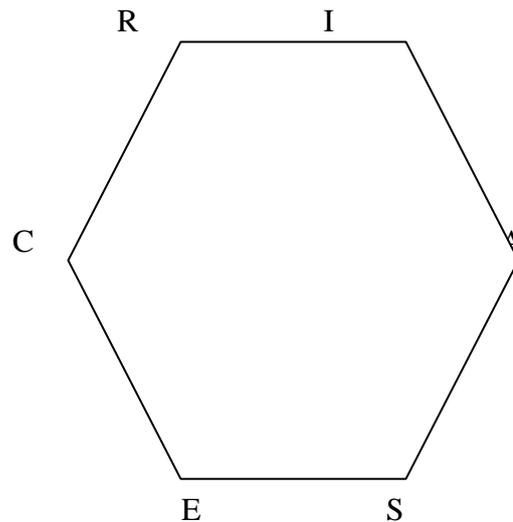


Figure 1.1: Holland Typologies: The Holland Hexagon

Key: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional

Source: Hollandcodes. com, 2012; Career Keys; 2023

The basic tenets of Holland theory are typology, congruence, consistency; differentiation and identity. Typology or vocational personality types describe differences between vocational environments and people. Holland (1997) used the term typologies (RIASEC) to assign a code to the six personality types namely: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Differentiation refers people who are dominated by one type but a person has a combination of types although most people can be described by a single pivotal type with others providing a moderating influence on behaviour and preferences.

Congruence refers to the agreement between a person's personality type and environment. Incongruence occurs when the opportunities and rewards provided by an environment are not understood by the individual (Hollandcodes.com, 2012, 1997). Incongruence occurs when opportunities and rewards provided by an environment are avoided. Consistency or similarity

refers to an individual whose first two letters of code are adjacent to each other on the hexagon are said to be similar.

The distance between the primary and the secondary typology helps to further define the specific characteristic of the individual. For instance, individuals whose first two letters of their Holland code are adjacent to each other on the hexagon for example, investigative and artistic, are expected to be consistent or similar than other types further apart while the types that are directly opposite each other are expected to be most inconsistent or least similar with each other. For instance, “the investigative type is similar to the artistic type and least similar to the enterprising type” (Woods & Hampston, 2010; Cotter & Fouad, 2011).

Identity refers to distinctive interests, skills and abilities. This is through self-knowledge (Shearer, 2007), expansion of career (Mantzaris, 2012) and enhancement of self-esteem (Kerka, 2012). According to Holland (1997), vocational personalities are formed as young people become familiar with their own abilities, develop competencies in accordance with those abilities, and begin to comprehend their own innate interests in various types of activities and occupations.

Holland’s (1997) theory has been applied to academic disciplines to help understand the differences among such disciplines in higher institutions of learning (Toomey, Levinson & Palmer, 2009; Cotter & Fouad, 2011; Miller, 2012). Therefore understanding Holland’s (1997) theory helps in making decisions about career choice (Ahmed et al., 2019). In this study the theory is applied in explaining variability in career choice among first year B.Ed students in a public university. Placement of students in a B.Ed degree programme should be an expression of typology where they are fulfilled matching their typologies to the academic environments. This will allow students to exercise their interests’ skills, abilities and take on agreeable training activities.

For example investigative personality type is drawn to scientific and mathematical occupations, for example a scientist working in a laboratory. Social personality type is suited for social or interpersonal occupations such as teaching. As Holland(1997 ,1996) argues that “people with specific vocational personality types are attracted to activities and occupations associated with those types, and they demonstrate behavioral repertoires, patterns of likes and dislikes, and concordant attitudes and values that support their developing interests” (p. 76). As rates of unemployment soar and career trends change, many parents “unwillingly allow

their children to study courses in disc-jockeying, acting, movie-making, animation and singing as opposed to traditional careers that parents prioritized for their children like accounting, engineering, medicine and law” (Oriedo, 2011).

Gardner’s (1983) multiple intelligences and Holland’s (1997) codes personality types leads to a more stable career choice (Shearer, 2006; Miller, 2012). The interaction between intelligence, personality type and the academic environment in which a student enrolls influences his/her behaviour pattern (Green, 2010). The benefits of enrolling in an academic environment that matches one’s interest and abilities include less stress, course retention, while the institutional benefits include less absenteeism, low dropout and high academic productivity (Allen & Robbin, 2010). Since the university academic environment is probably offering subjects that share similar characteristics with different occupational environments, the students should be aware of interests, competences, skills, attitudes and abilities developed in selected academic fields” (Feldman et al., 2001 p.45).

1.11 Definition of Operational Terms

For the purpose of the study, the pertinent terms are operationally defined as follows;

Career: A job, a profession, vocation, for which one is trained or is training and which one intends to follow for the whole of one’s life

Career choice: This is preferred occupational choice. For the purpose of this Study, career choice includes the undergraduate Bachelor of Education degree programmes (B.Ed-Arts with IT, B.Ed-Science with IT, B.Ed-Special Needs with IT, B.Ed- Early Childhood development and Education with IT, B.Ed- French with IT) and B.Ed- Music with IT) and B.Ed- Home science with IT) being pursued by the students.

Degree program: This is the specific academic program of study a student is pursuing. An entire training degree programme design made up of course units, content, methodology and organization like B.Ed – Science with IT.

Gender: The psychological features and sociological categories of males and females created by human cultures. In this study, gender refers to male and female first-year students in the university.

Multiple Intelligences: Also referred to as types of intelligence based on Howard Gardner’s classification. The different unique ways to demonstrate intellectual

ability and benefit from the experience learn new ideas and sets of behaviour in dealing effectively with one's environment.

Personality types: In this study, personality will refer to attributes/characteristics as shown by the RIASEC three letter codes measured by the SDS activities, with the first letter indicating the personality type.

Public Universities: These are universities the owned by the government and are financed be the treasury.

Undergraduate Students: The students enrolled in a public university to persue a bachelors' honors degree programme. In this study, these were students enrolled in their first year of study to persue B.Ed degree programme.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter outlines a detailed description of reviewed literature based on the study objectives. Literature review is organized in the following sub-sections;

- i. Types of intelligence among first-year undergraduate students
- ii. Types of intelligence across gender among the first-year undergraduate students
- iii. Personality types across gender among the first-year undergraduate students
- iv. Types of intelligence across career choice among first-year undergraduate students
- v. Personality types across career choice among first-year undergraduate students

2.2 Types of Intelligence among First-Year Undergraduate Students

Many psychological studies assert that intelligence is not a single trait (Sternberg, 2003, 2018). Cohen (2012) defines intelligence as the capacity of an individual to act purposefully, think logically and deal with the environment. However Gardner broadened the concept of intelligence and formulated a unitary theory on types of intelligence called Multiple Intelligence (MI) (1983) theory which emphasizes types of intelligence which are autonomous but interactive.

A type of intelligence comprises assets of specific skills that embody both convergent problem solving as well as divergent thinking abilities and has its own memory system with specific cerebral structures dedicated to processing its specific contents (Gilman, 2012). For example, “interpersonal and intrapersonal intelligences are relating functions of the frontal lobes of the human brain” (Al-Sabbah, Al- Sabbah & Abod, 2011). Hence a person may have all the multiple intelligences or some of them with varying degrees as postulated by Eid and Alizh (2004), who observe that a person can have extra ordinary linguistic intelligence but low musical intelligence. To qualify as a type of intelligence, a particular capacity is considered from multiple perspectives drawn from the biological sciences, logical analysis, arts and humanities, psychology and psychometrics (Gardner, 2003). Each type of intelligence must have an identifiable core operation or set of operations in the context of the environment (Gilman, 2012).

The following is a detailed description of distinctive types of intelligence as postulated by Gardner’s (1983) model;

2.2.1 Bodily - Kinesthetic Intelligence

This is a manual type of intelligence characterized by the ability to control body movements and skillfully handle and construct objects (Gardner, 2012; Armstrong, 2012; Shearer & Luzzo, 2009). It involves good eye-hand coordination and sense of balance, for example in ball play. This intelligence suggests that “problem solving can occur when mental stimulation is supported by physical movement” (Green, 2010).

2.2.2 Logical - Mathematical Intelligence

This is the ability to use reason, logic and numbers. It includes the building of concepts in a logical and numerical pattern and connecting pieces of information. The intelligence of reason is characterized by ferocious logic and curiosity about the world, intense questioning and experimentations. According to Shearer and Luzzo (2009), “this type of intelligence is characterized by thoughts that are logical and mathematical in nature which show cause-effect connections and comprehend relationships among actions, ideas or objects. Young adults with lots of logical-mathematical intelligence are interested in patterns, categories and relationships” (Abdel, 2006; Lin, 2009; Gardner, 2012). The divergent and reflective aspects of logical-mathematical intelligence include the identification of novel problems or the generation of newer and worthy questions (Ahmad, 2010; Shearer, 2006). Kincheloe (2007) concludes that mathematical intelligence is not about mathematics or problem solving but the relationships one can draw from engaging in discussions.

2.2.3 Verbal - Linguistic Intelligence

Kincheloe, (2007) defines verbal - Linguistic Intelligence as the ability to use words and language and it encompasses both the spoken and the written varieties of language. The linguistically intelligent skills include meta-linguistic skills, listening, speaking, writing, storytelling, explaining, teaching, using humour, comprehending the syntax and meaning of words, recalling information convincing someone of their points of view and analyzing language usage (Armstrong, 2012; Shearer & Luzzo, 2009).

2.2.4 Visual - Spatial Intelligence

This refers to the ability to perceive the visual. Individuals who possess this kind of intelligence have high visual and mental manipulation skills which create a cognitive ability to recall and process information. Gardner (2012) argued that “young adults with spatially intelligent skills may be fascinated with mazes, jigsaw puzzle buildings, reading, writing, understanding charts and graphs, a good sense of direction, sketching, painting, drawing, and

creating visual metaphors and analogies, manipulating images, constructing, designing and interpreting visual images”. According to Gardner (2012), “the pressure of the environment results in the selection of spatial intelligence abilities which are critical for the survival of species”. For instance, early hominids had to navigate diverse terrains using spatial abilities (Gilman, 2012). Spatial visualization and spatial scanning are two significant aspects and distinct domains of spatial abilities (Razmjoo, 2008).

2.2.5 Naturalistic Intelligence

This is the ability to avidly interact with nature, nurture others, exhibit moral responsibility, and discriminate among living things and being sensitive to other elements of the natural world like clouds, rock configuration and evoking good emotions (Gardner, 2012; Shearer & Luzzo, 2009). Tirri and Nokelainen (2008) assert that naturalist intelligence includes love for nature, conservation of nature and promoting habits that environment-consumer friendly” (p. 34). Gardner (1999) asserts that “an individual who possesses this type of intelligence has the ability to find patterns and relationships to nature and is highly aware of subtle changes taking place in his/her environment” (p. 56).

2.2.6 Intrapersonal Intelligence

According to Wilson, (2018) intrapersonal intelligence refers to self-focus and self-control, personal motivation to achieve a goal, and persistence in goals. This is the ability to self-reflect and beware of one’s inner state of being. The capability to comprehend one’s wishes, inner feelings, dreams, to act with personal effectiveness, strengths and weaknesses is a sole demand of intrapersonal intelligence (Ghazi et al., 2011; Gardner, 2012; Armstrong, 2010, 2009; Shearer & Luzzo, 2009). Intrapersonal intelligence puts emphasis on the cognitive, metacognitive and behavioural aspects of self-understanding, self-reasoning and understanding one’s role in a relationship with others (Lumei & Turda, 2022; Gardner, 2006).

2.2.7 Musical - Rhythmic Intelligence

This is the capability to produce and appreciate music (Gardner, 2012; Armstrong, 2010, 2012). The unique ear for timbre, tone, rhythm and pitch singing is a blend of intelligence. The musically intelligent think in terms of sounds, rhythms and patterns and possess the ability to engage in active listening and identifying links between music and emotions (Shearer & Luzzo, 2009; Passadino, 2021)). The musically intelligent skills include “playing musical instruments, singing, recognizing tonal patterns, remembering melodies, composing

music and comprehending the structure and rhythm of musicals well as sensitivity to sounds” (Armstrong, 2012).

2.2.8 Interpersonal Intelligence

The interpersonal intelligence skills include “listening, empathy, group cooperation, noting people’s moods, motivations and communicating intentions, conflict resolutions and establishing positive relations with others” (Lumei & Turda, 2022; Gardner, 2012). Interpersonal intelligence entails excellent organizational abilities bordering on manipulation, encouraging corporation and group setting skills through use of verbal and non-verbal cues to open up to others. “Those who possess charismatic personalities due to their desire to interact with people are also classified as interpersonally intelligent” (Armstrong, 2012; Murphy & Hall, 2011).

2.2.9 Existential Intelligence

This includes the “sensitivity and capacity to tackle deep questions about human existences such as the meaning of life, why we die and how we get on earth and why we are born” (Wilson, 2012; Gardner, 2012). According to Wilson (2012), “the existence of existential intelligence is real and important especially among children who appear to have ‘old souls’ and are ‘fully aware’ of the universe- its multiplicity, complexity and wonder (p. 34). According to Tirri et al., (2006), “the dimensions of spiritual intelligence include awareness sensing, mystery sensing, value sensing and community sensing” (p. 13).

Göğebakan (2003) investigated how students’ multiple intelligences differ in terms of grade level and gender. Students at the first grade level demonstrated strong preferences for linguistic (mean=5,51 sd=1,78) and logical mathematical intelligences (mean=4,81 sd=1,95). The third grade students most dominant intelligences were interpersonal (mean=4,59 sd=1,43), spatial (mean=4,55 sd=1,53), For the fifth grade students, interpersonal intelligence (mean=6,23 sd=1,23) bodily-kinesthetic intelligence (mean=4,86 sd=1,54), were more dominant while for the eighth grade, interpersonal intelligence (mean=6,44 sd=1,73), was more dominant. The study by Göğebakan (2003) did not address existentialist intelligence, a profile that the current study sought to establish among undergraduate in a selected public university in Kenya.

Matto et al. (2006) conducted an exploratory study at Virginia Commonwealth University to determine faculty perceptions of the importance and effectiveness of MI when used for social

work practice and education. Participants were 91 faculty members, composed of a mix of ethnicity and gender. Results showed that most faculty members ranked their linguistic (97.2%), intrapersonal (94.3%), and bodily-kinesthetic (89.7%) intelligences higher while logical- mathematical intelligence (29.4%) was ranked as the lowest. Ozdemir et al. (2006) found that adolescents in Turkey ranked highly in logical-mathematical intelligence, followed by interpersonal and bodily kinesthetic. However, the findings further showed that musical intelligence was least common, a finding significant for this study.

The study conducted by Al-Alwan (2008) aimed at identifying the multiple intelligence preferences among 4th and 8th graders in Maa'n governorate in 2006/2007. The study explored the differences in these preferences based on variations in gender and grade level. The results of the study showed that the preferred intelligences among 4th graders included the linguistic, logical-mathematical, spatial and bodily-kinesthetic intelligences. However, the 8th graders preferred the bodily-kinesthetic, interpersonal, musical and naturalist intelligences. The results also revealed that the least preferred intelligences were the existential and naturalistic. The comparative study by Al-Alwan (2008) examined students in two grades while the current study utilized first year B. Ed students. Despite the differences with regard to the respondents used in the two studies, the findings are significant to this study as the results show dominant and less preferred intelligences.

Shariffudin (2010) explored the pattern of multiple intelligence among high achievers from Maktab Rendah Sains MARA in Malaysia. The results on Multiple Intelligences showed that the high achievers possessed the following intelligences; Musical/Rhythmic, 48%; Logical/mathematical, (44.8%); Existential, 41.6%; Verbal/Linguistic (40.8%); Visual – spatial, (39.2%); Interpersonal, 29.6%; Naturalist, 29.6%; bodily-kinesthetic (36%); and Intrapersonal, 31.2%. This implies that high achievers possess different types and levels of multiple intelligence. This study is similar to the current one which sought to establish the types of intelligence among first year undergraduate students in a selected public university in Kenya.

Al-Sabbah et al., (2011) measured the level of MI of students from a sample of 13 out of a population of 206 Jordanian high schools. The results showed that students scored very high in mathematical intelligence (89.5%), kinesthetic intelligence (79.5%) and linguistic intelligence (79.4%). However, the students scored poorly on musical intelligence (29.6%)

and natural intelligence (26.5%). Al-Sabbah et al. (2011) focused on Arabic students only and the authors attributed the low scores on musical and natural intelligences to the teaching of Islam which forbids the teaching of music and the fact that Muslims are required to be merciful towards animals. This study is similar to the present one which also sought to establish the frequencies with regard to the musical and natural intelligences among first year undergraduate public university students.

Ozgen et al. (2011) examined multiple intelligence domain and learning styles of pre service mathematics teachers studying in the Department of Secondary Mathematics Teachers Education at a public university in Turkey. Employing the survey model, the study was conducted with a sample of 243 (112 or 46.1% males and 131 or 53.9% female) among first, second, third, fourth and fifth graders. The findings showed that pre service teachers had the highest logical-mathematical intelligence (mean = 28.89; SD = 5.31), moderate advanced levels in verbal-linguistic intelligence and lowest in musical rhythmic intelligence (mean = 20.05; SD = 8.17). While Ozgen et al. (2011) focused on Math group only, this study focused on nine types of intelligence among first-year students in five cohorts of a B.Ed programme in a selected public university in Kenya.

In a multiple intelligence action research among American schools, Acosta (2012) found that 91% of students reported that they enjoyed activities that allowed them to be creative while 60% reported they enjoyed activities that allowed them to think in the non-traditional ways. Furnham and Baguma (2012) found significant national differences between Americans and Africans on the mean scores of Gardner's intelligences. Whereas white Americans reported higher mean estimates on logical, spatial, mathematical, musical and bodily-kinesthetic Africans rated higher in verbal intelligence. The comparative study by Furnham and Baguma (2012) compared the MI profile between races; however the current correlation study was conducted among predominantly multiethnic African student population in Kenya.

Manasseh (2013) conducted a study on the relationship between Multiple Intelligence and Self-efficacy among a sample of Hashemite university students'. The author sought to establish the multiple intelligence abilities of the students' means and standard deviations were calculated and reported. From sub-scales obtained it was noted that musical emerged the first followed by the other types as captured below: musical (M=2.70), verbal-linguistic (M= 2.54), naturalist (M= 2.52), visual (M= 2.50), bodily-kinesthetic (M= 2.46), logical (M= 2.42), intrapersonal (M= 2.42) existential (M= 2.40), understanding and interpersonal (2.16).

Mahasneh (2013) study is significant to this study as it sought to establish the nine types of intelligence among undergraduate students which is one of the objectives of this study. However, whereas Mahasneh (2013) found interpersonal intelligence to be low among Heshemite university undergraduate students, a finding significant to this study.

Hanafiye (2013) investigated the relationship between students' gender and intelligence types, the relationship between particular intelligence types and students' success in grammar, and writing in English as a foreign language among randomly selected 140 students from Islamic Azad University Tonekabon ranch, Iran. The analysis revealed that logical mathematical intelligence (mean: 3.88) the leading intelligence while musical intelligence (mean: 3.18) was less common. The study by Hanafiye (2013) even though conducted among Islamic students, is significant to this study as it revealed dominant types of intelligence like interpersonal and less common intelligences type like musical intelligence.

Mustafa et al., (2014) investigated types of Multiple Intelligences among Undergraduate Students at Yarmouk University in Light of Gardner's theory and results showed that linguistic intelligence ranks first with mean scores of (9.97) and SD of (3.02) while the visual-spatial intelligence ranks last with mean scores of (6.98) and a SD of (3.68). The authors attributed these results to the focus that the Jordanian government has placed in its educational systems at both the basic and higher levels which aims at developing linguistic intelligence among students through using teaching strategies based on exposition, lecturing, questioning, and dialogue as well as using verbal and written language in varied types of assessments and evaluations.

The study by Mustafa et al. (2014) is significant to this study which also notes that a lot of time and resources have been dedicated to the development of linguistic intelligence through the use of varied strategies employed to promote it in a country's educational system thereby making it rank first among undergraduate students. The authors attributed the results to features of university life including a diversity of co-curricular activities, selecting preferred courses, being responsible for one's studies, the nature of relationships and the social interaction at all levels support students in developing their personal skills.

Yavich and Rotnitsky (2020) examined the relationship between dominant intelligences according to Gardner's multiple intelligence theory and middle school students' academic achievement. The case study was conducted in Israel, in a middle school, among seventh-

graders and involved 158 students. Findings indicated that in excellent classes, 80.9% of students had logical intelligence, in at least one of the levels of dominance; in ordinary classes only 48.4% of students have logical intelligence, at least in one of the levels of dominance. We also examined the relationship between the amount of dominant intelligences among students in all classes, excellent and ordinary. Findings indicated that in excellent classes the percentage of students with two or three dominant intelligences was higher than the percentage in ordinary classes. It is important to note that these are not just the logical and verbal, but also all types of intelligences, such as spatial, musical, and kinesthetic and others.

Okatcha et al., (2012) examined the organization of the concept of intelligence among the Luo people in Kenya and asserted that the concepts (*Rieko, Luoro, Paro and Winjo*) appear to form two latent structures namely: socio-emotional and cognitive competences. According to Okatcha et al., (2012) opined that “people may have relatively high levels of intelligence in an academic setting yet show little in a practical one”. In the Africa context, “intelligence has many attributes such as responsibility, honesty, verbal memory, speaking in socially appropriate manner, being observant and manual dexterity” (Sternberg, 2018). The African conception of intelligence also majorly revolves around skills that facilitate and maintain intergroup relations (Nasser et al., 2006). Silence is regarded as intelligence among some communities in Africa. For example, among the Wolof tribe of Africa, those who speak less are considered intelligent (Sternberg, 2003). Research findings among the Buganda (as cited in Reggio et al., 2002) revealed that the Buganda people of Uganda associate intelligence with careful and deliberate thoughts and considerations of alternative solutions coupled with slow internal examinations before sharing thoughts with others.

Okatcha et al., (2012) respondent’s were from a specific ethnic community, the preset study was conducted among multiethnic and multicultural population of undergraduate first year students studying at a public university in Kenya. In yet another case study, Okatcha et al. (2012) tested the notion that academic and practical intelligences are separable and distinct constructs and found that scores on the test of tacit knowledge correlated significantly negatively with measures of academic intelligence and achievement, which were at odds with one another. This implies that a person’s ability to function in the routine of daily life and solve any problems that occur therein constitute intelligence.

The point of convergence between this study and the current one is that they both sought to establish types of intelligence not purely defined by examinations but in practical settings. In

addition, standardized I.Q tests have been criticized to have a self-fulfilling effect, to be inconsistent with success, and to discriminate against people outside of mainstream culture. The KCSE examination results utilized to place students in university degree programmes have also been found to be limited hence ignoring other human intelligences. Hence the choice of Gardner's Multiple Intelligences profiles (1983) to establish the types of intelligence among first-year undergraduate B.Ed students in a public university in Kenya.

The studies reviewed above are significant to this study as the authors found that their subjects possessed different types of multiple intelligences. It is obvious that there are many studies that have addressed the multiple intelligences theory in varied topics, levels and cultures. Apparently, no study was found to have been done based on a culture-fit model of MI to establish types of intelligence among any cohort of its students undertaking any programme offered in a public university in Kenya.

The review of literature revealed no specific study based on Gardner's MI model to establish types of intelligence among students at a public University in Kenya. Therefore, these types of intelligence may have largely remained untapped by public university education and research and probably widely unknown to most students. It was therefore important to establish the types of intelligence based on Gardner's (1983) MI model among first year undergraduate B.Ed students in a selected public university in Kenya.

2.3 Types of Intelligence across Gender among First-Year Undergraduate Students

By and large, several studies have indicated the need for research in gender related differences in intelligence (Wendy & Johnson, 2007). According to Cooijmans (2013) "sex differences in mental abilities are caused by hormonal differences (estrogen / testosterone) balances which work partly prenatally and partly after puberty" (p. 24). Females are slightly better than males at straight forward arithmetic (not complex mathematics). Females outscore males in perceptual speed with their advantage in such tasks as matching figures, clerical checking, speed and accuracy varying from .2 to .4 SD.

Cooijman (2013) further found that "males are better than females in spatial ability, mental manipulation of figures in two or more dimensions". The difference varies from .3 to .5 SD. Males are better in numerical ability at .1 to .25 SD. while in spatial ability there are huge differences favouring males. This therefore supports the several studies which have reported

gender differences in specific cognitive abilities with some supporting females and others males (Hyde, 2005; Lin, 2009).

Lynn et al. (2001) investigated sex differences in general knowledge, and intelligence between 469 females and 167 male undergraduate students at Ulster University. The study covered eighteen domains of knowledge namely: politics, sports, history, classical music, art, literature, general science, geography, cookery, medicine, games, discovery and exploration, biology, film, fashion, finance and popular music. Men obtained higher means than women in current affairs, physical health, recreation, art and science whereas women scored highly in fashion, cookery and literature.

Menevis and Efe (2014) reported higher self-estimates among males for logical-mathematical and spatial intelligences, while female estimates were significantly higher for musical and interpersonal intelligences. The above studies by Lynn et al. (2001), Menevis and Efe (2014) revealed in multiple intelligences across gender which is consistent with the objective of the present study which utilized undergraduate students as its respondents.

Göğebakan (2003) examined how students' multiple intelligences differ in terms of gender and results showed a significant difference among the students' logical-mathematical intelligence mean according to gender ($p < 0,05$; mean= 3,21 sd=1,99 males' mean=4,29 sd=2,25) students' logical-mathematical). Bodily- kinesthetic intelligence mean scores ($p < 0,05$: mean=4, 14 SD=1, 70) males' was (mean= 4, 72 SD=1, 54). There was significant differences among the students' mean scores for musical intelligence according to their gender ($p < 0,05$). The author concluded that male students tend to prefer the logical-mathematical and bodily-kinesthetic intelligences while female students tend to prefer the musical intelligence. The finding of this study is significant to the present study whose specific objective postulated that multiple intelligences across gender related among the first year undergraduate B. Ed students in a public University in Kenya. The difference between this study and the current one however was that the former used respondents in basic education while the latter those in university education.

Afanah and Al-Khazendar (2003) conducted a study to identify the level of multiple intelligences among 1-10 grades students of the lower elementary cycle in Gaza and the relationship of these levels with achievement in Mathematics and student tendency towards this subject. The sample of the study consisted of 1387 male and female students in Gaza

government schools. The findings of the study revealed that males out do females in logical-mathematical and bodily-kinesthetic intelligences. The study by Afanah and Al-Khazendar (2003) focused on mathematic achievement among students of lower elementary level. This study is similar to the current one in the sense that both bring to perspective gender related differences with regard to multiple intelligences. However, the respondents used in the two studies are different with the former using the first to tenth graders from different schools in Gaza while the latter, first year undergraduate B. Ed students in a selected public university.

Loori (2005) utilized a sample of ninety international students of English as a second Language. The author found that interpersonal intelligence ranked as the highest strength for both males (5.22) and females (4.73). Logical-mathematical was the next highest strength for most males, whereas females' second highest intelligence preference was spatial intelligence with a mean of 4.18. Johnson and White (2002) examined the MI strength among students of Criminal Justice at the University of West Florida. The participants were female ($n=110$ or 58.8%) and males ($n=77$ or 41.2%). The authors found significant verbal-linguistic intelligence results that indicated more strength for females (10.9%) than males (2.6%).

Whereas Johnson and White (2002) focused on Criminal justice students, Loori (2005) used Teele inventory in non-African populations. These two researches are similar to the present study in the sense that both studies were interested in establishing multiple intelligences among students. The point of divergence is that Loori (2005) utilized a smaller sample of ninety international students of English with the current study participants were first year B.Ed students in a selected public university.

Wendy and Johnson (2007) sampled 436 (188 males, 248 females) participants from Australia, Great Britain and North America and found very minimal gender differences with regard to mental ability. However, males performed better on visual-spatial tasks while females performed better on tests of verbal usage and perceptual speed. Nasser et al. (2006) investigated gender differences on estimates of multiple intelligences using a sample of 648 Lebanese and 252 Indian students. Males were rated highly on bodily-kinesthetic as compared to females while females estimated their verbal and intrapersonal intelligences higher than males. The authors argue that in societies characterized by kinship and patriarchal systems, distinct biases prevail towards higher male self-estimates on mathematical and kinesthetic abilities. The finding of this study is critical to the present one which sought to establish multiple intelligences across gender among first year undergraduate B. Ed students.

Adrian and Buchanan (2005) also asserted that this difference is consistent across countries and populations although there are wide differences in the level of intelligence.

Tirri and Nokelainen (2008) operationalized the nine MI scales by testing with an empirical sample of Finnish preadolescents ($n=183$) and adults ($n = 227$). Results of the correlation analysis between gender and the MI scales showed that boys rated their logical-mathematical intelligence higher than girls ($r(183) = .39$; $p < .01$; $r^2 = .15$) while females tended to rate their linguistic abilities higher than males ($r(183) = -.18$; $p < .01$; $r^2 = .03$). In a similar study carried out among university students by Tirri and Komulainen (2002), male students were found to rate highly in logical-mathematical intelligence than females ($r(256) = .27$; $p < .001$; $r^2 = .07$). Unlike this study which focused on a widespread age group, the study by Tirri et al. (2008) which focused on preadolescents only was demographically limited just unlike the current study conducted among first year male and female undergraduate B. Ed students in a selected public university in Kenya .

Nofal and Al-Heeleh (2008) investigated the differences in Gardner's multiple intelligences among students in UNRWA/Jordan higher education institutions within the 1st academic year. The sample of the study consisted of (515) male and female students, distributed into two groups; (103) males and (412) females. The findings showed that there were statistically significant differences attributed to gender on the logical-mathematical, visual-spatial, and interpersonal intelligences in favour of females and in the musical intelligence in favour of males. The results also indicated that there were no significant differences between males and females on the linguistic, bodily- kinesthetic, intrapersonal, and naturalistic intelligences. Similarly the current study sought to establish multiple intelligences across gender among undergraduate first year B. Ed students in a public university in Kenya.

Net et al. (2008) conducted a study to investigate the relationship between gender and attitudes towards intelligence and self-assessment of multiple intelligences. The study sample consisted of 242 male and female students. The results of the study found out that there were significant differences between them in accordance to gender where the males rated themselves higher than females in the logical-mathematical, spatial, spiritual, and naturalistic intelligences. The study revealed significant differences through self- assessment as was revealed in the questionnaires utilized in this study. This current study utilized a self rating questionnaire with a sample of 220 respondents to establish multiple intelligence across gender among the first-year students in the B.Ed programmes in a public university in Kenya.

In a study to investigate the relationship between multiple intelligence and language proficiency among Iranian PhD candidates in Shiraz university who undertook a PhD entrance exam, Razmjoo (2008) found no significant difference among 119 male (mean=311.60; SD=37.16) and 99 female (mean=309.64; SD=34.45) participants' multiple intelligences in general and each type of intelligence in particular. However, the author concluded that the results were clearly suggestive due to lack of cooperation among students, lack of feasibility with respect to types of intelligences and influence of other variables like age and fields of study. Whereas Razmjoo (2008) focused on PhD student's entrance examination, the present study investigated types of intelligence across gender among undergraduate first year students admitted to a public university and who are in the course of settling in a degree programme. In Razmjoo (2008) case, the focus was on PhD (postgraduate) students who had settle in a career and only sought retooling in specific fields like research.

Naderi et al (2008) investigated the difference between gender-role identity and intelligence among randomly sampled 153 undergraduate Iranian students (48 females and 105 males) in Malaysian Universities. The authors administered a Cattell Culture fair Intelligence Test and the results of the descriptive statistics focusing on average and t-test showed no significant differences between female and male students in relation to intelligence ($p=0.443$; mean=-1.932). While this study adopted Cattell Culture Fair Intelligence Test, the focus of the present one was to establish multiple intelligences across gender among first-year undergraduate B. Ed students. The study used a multiple intelligence questionnaire as the main instrument for data collection. The choice of this instrument was based on the fact that no previous researches have been done in a public university using the multiple intelligence questionnaire as the primary instrument.

Lin (2009) examined major differences (the gender variable being among them) in self-estimates of multiple intelligences within pre-service teachers at the National Changhua University of Education in Taiwan. The participants were 411 pre service teachers drawn from academic department. The result showed significant higher self-estimates for the male participants with regard to the mathematical-logical (mean=39.65, $t\text{-value} = 8.64^{***}$) and bodily-kinesthetic (mean=42.51, $t\text{-value} = 3.58^{***}$) intelligences while females rated highly in Verbal-linguistic (mean=36.72, $t\text{-value}=3.14^{**}$) and musical-rhythmic (mean=38.90, $t\text{-value}=3.14^{**}$) intelligences.

value=-2.77) intelligences. Lin (2009) study is similar to the current study because in both cases the study population were preservice teachers pursuing an undergraduate programme.

Serin et al. (2009) carried out a comparative study on factors affecting teaching styles and the multiple intelligence types of primary school teachers in Turkey and Cyprus. Simple random sampling was used to sample 140 (57%) female and 105 (42.9%) male primary school teachers. The results showed that naturalistic intelligence changes in favour of male teachers ($t = 2.220$; $p < 0.0001$) working in Cyprus (Lefkosa) while spatial intelligence changes in the favour of the ones ($t = 3.915$; $p < 0.001$) working in Turkey (Izmir). The comparative study by Serin et al. (2009) investigated teaching styles and MIs among randomly sampled primary school teachers in two countries and results showed distribution of intelligence types across gender. Even though this was a comparative study which used simple random sampling to obtain the sample population, the findings are relevant to the current study which employed stratified sampling to establish the types of intelligence among male and female undergraduate B. Ed students in a selected public university in Kenya.

Ishhq et al. (2010) investigated students' MI according to their preferences and how the students' MI differs in terms of gender at elementary level. A sample of 2000 (50% males and 50% females) seventh class students aged above 12 years was drawn using stratified random sampling. Significant differences were observed in the mean scores of boys and girls for linguistic ($Z = 1.97$), body-kinesthetic ($Z = 5.54$), interpersonal ($Z = 4.45$) and naturalistic ($Z = 3.89$). Males were ahead of females in logical and bodily-kinesthetic while females took slight leads in linguistic and musical intelligences. The study although conducted among elementary level students is important to this study as the author revealed multiple intelligence across gender which is similar to what the second objective of the current study. The differences between the two studies is that the one conducted by Ishhq et al. (2010) used respondents at the elementary level of education while the present one used first year undergraduate students in a public university.

Shahzada et al. (2011) investigated Self-Perceived Multiple Intelligences of first year male and female students in all government degree colleges during the 2010 session in Bannu district.. Using convenient sampling techniques, a sample of 714 students (379 males and 335 females) were selected for the study. It was revealed that the mean score of the male self-perceived intrapersonal intelligence was mean=3.26 and female mean=3.57, SD=.64, .55, P value is .00 which is less than $\alpha 0.01$ which means that there is a significant difference

between male and female self-perceived intrapersonal intelligences. The mean score of the male self-perceived visual/spatial intelligence was mean=3.05 and female mean=3.24, SD=.73, .63, P value is .00 which is less than α 0.01 which means that there is a significant difference between male and female self-perceived visual/spatial intelligence in favour of females. The result of self-perceived logical/mathematical intelligence revealed a mean score of mean= 3.12 and female mean= 2.94, SD=.89, .84, P value is .00 which is less than α 0.01 which means that there is a significant difference between males and females self-perceived logical/mathematical intelligence in favour of males. Even though the study by Shahzada et al., (2011) employed convenient sampling and did not examine gender difference in existential intelligence, the study is significant to the current study's second objective which adopted purposive and proportionate stratified sampling to establish types of intelligence across gender differences among the first-year undergraduate students in the B.Ed programmes in a in a selected public university in Kenya.

Mahasneh (2013) conducted a study on the relationship between Multiple Intelligence and Self-efficacy among a sample of Hashemite university students to determine if there are significant differences on the use of multiple intelligence among the respondents when grouped according to sex and academic performances. Mean and standard deviations and t-test were calculated, for example bodily-kinesthetic (males 2.49, SD, .62; females, mean 2.43 SD, .59 and logical-mathematical (males mean 2.40; SD .64; females mean 2.43, SD .54). The results portrayed no significant differences in the level of all sub-scales of the multiple intelligence between males and females. Mahasneh (2013) focused mainly on logical mathematical, linguistic, spatial and bodily-kinesthetic and no other significant MI profiles like existentialist, intrapersonal and naturalistic which were examined by this study.

Hanafiye (2013) further investigated whether there is a significant difference between female and male students in terms of their types of Intelligences. Results show that intrapersonal, linguistic, logical, and musical intelligences were more common among females. Further analysis of group difference revealed a significant difference between males and females only in linguistic intelligence ($p < .02$). In conclusion, Hanafiye (2013) study is instrumental to the current study's second objective which also sought to establish types of intelligence across gender differences among the first-year undergraduate students in the B. Ed programmes in a selected public university in Kenya.

Mustafa et al. (2014) further investigated types of multiple intelligences among undergraduate Students at Yarmouk University in Light of Gardner's theory to find out if there are statistically significant differences in multiple intelligences abilities among the students. Results attributed to the gender variable showed that there are no statistically significant differences ($p=0.05$) between the mean scores of the male and female respondents on intrapersonal intelligence while there are significant differences ($p= 0.05$) between the mean scores of the male and female respondents on the rest of the intelligences. The study is instrumental to the current study which showed that males were favoured on the mathematical, visual-spatial, bodily-kinesthetic, and naturalistic intelligences while females were favoured on the linguistic, interpersonal, and musical intelligences.

The above studies are significant to this study even though some examined gender differences in specific but not all types of intelligence. Cooijmans, (2011) focused mainly on logical mathematical, linguistic, spatial and bodily-kinesthetic and no other significant MI profiles like intrapersonal and naturalistic. Studies by Tirri and Nokelainen, (2008) focused on preadolescents only in non-African populations hence was demographically limited. Therefore the focus of this study was to establish Gardner' multiple intelligence (1983) profiles among male and female students in a in a selected public university in Kenya.

2.4 Personality Types across Gender among First-Year Undergraduate Students

Personality refers to measurable traits that a person exhibits (Robbins and Judge, 2019). Human personalities differ because of different traits within people (Mweru & Njuguna, 2009; Pervin et al., 2005). According Hossain (2023), academics discuss personality models and approaches, such as: The Five-factor Model of Personality, The RIASEC Model of Personality, Extroversion Introversion Typology, Myers-Briggs Type Indicator, Personalities of Types A and B, Eysenck's Approach and The Dark Triad. Holland (1997) developed most empirical, reliable, valid, and widely applied Holland Codes career development theory of vocational personality types which describes personality type's vis-à-vis occupational interests (Kennelly et al 2018; Hossain (2023)). The following is a detailed description of distinctive personality types;

2.4.1 The Realistic Personality Type

The solid orientation of this personality type is towards physical skills, masculinity and ability to control body movement with a de-emphasis on social interpersonal and verbal skills. The Realistic personality type are those who possess mechanical, practical, hands-on,

technical and manual competencies and have a preference for solving concrete and tangible problems (Gottfredson & Holland, 1996; Hollandcodes.com, 2012; PASD, 2012; Career Keys; 2023). As described by Onoyase and Onoyase (2009), such personalities are usually “compelling, conforming, candid, conscientious, tenacious, sturdy, robust, timid, reliable, physically strong, frugal, unsocial and regularly aggressive”

2.4.2 The Investigative Personality Type

This personality type is described as investigative, careful, critical, inquisitive, independent, introspective, procedural, prudent, accurate, sensible, scholarly, independent and restrained. This personality type centers around “science and scientific activities and those who possess it are always original, creative, task oriented and finds pleasure in solving abstract problems, making extensive use of their intelligence, always thinking, organizing ideas and trying to comprehend issues”(Onoyase & Onoyase, 2009). These personality types “enjoys ambiguous challenges and do not function optimally in structured situations with many rules” (Hollandcodes.com, 2012; PASD 2012; Hossain, 2023) ; Career Keys; 2023).

2.4.3 The Artistic Personality Type

The artistic personality resembles the investigative one in that they prefer to work alone, are less aggressive but more sensitive, emotional, candid and original. They can also be described as independent, atypical, emotionally reminiscent, tense, impetuous, practical, inventive, conforming, sophisticated and disorderly. Artistic personality type is drawn to creative forms of the arts. Additionally, “those who are in this category are reported to possess an intuitive ability that they usually draw upon during work-related situations” (Hollandcodes.com, 2012; PASD, 2012; Hossain, 2023); Gottfredson & Holland, 1996).

2.4.4 The Social Personality Type

Social personality type likes working with people but avoids intellectual pursuits. They are outgoing, accountable and concerned with the welfare of others. They prefer to “solve problems by discussing, serving, inspiring, teaching others or by arranging or rearranging relationships between others” (Onoyase & Onoyase, 2009). They have limited interest working with machinery and describe themselves “as emotional, jolly, popular, morally achieving, existential and good. Social personality type enjoys assisting and informing others in a systematic environment” (Hollandcodes.com, 2012; PASD, 2012; Career Keys; 2023).

2.4.5 The Enterprising Personality Type

The Enterprising types have great facility with words and they draw success through manipulating others. They prefer social tasks and are socially vibrant, fervent, venturesome, compelling, self-confident and predominant. They like power, attention seeking, ambitious, authoritarian, hedonistic, self-assured, popular, attention getters, and material wealth seekers who enjoy working in expensive settings but are quite impatient with work involving long periods of intellectual effort. Holland (2012) described enterprising individuals as “possessing a natural ability to exploit and influence others” (p. 132). Taking a valid political stance and asserting aggressive behaviour is typical characteristic this group (Gottfredson & Holland, 1996; Hollandcodes.com, 2012; PASD 2012; Hossain, 2023)).

2.4.6 The Conventional Personality Type

The ability to use words, language, reason, logic and number in highly ordered activities and well established chain of command settings is a characteristic of the conventional personality type (Onoyase & Onoyase, 2009). The personality type is conforming, systemized, cautious, conservative, conscious, constrained, obedient, orderly, resolute, efficient, tranquil and self-controlled and responds to power but have little interest in problems requiring physical skills. They are effective in well-defined tasks as they prefer to know precisely what is expected of them. (Hollandcodes.com, 2012; PASD 2012; Hossain, 2023); Career Keys; 2023).

Gender therefore “remains fundamentally correlated to Holland’s vocational classification” (Smart et al., 2000; & Pike, 2006). Daisy and Tracey (2007) assert that “the Holland’s basic structure (quasi-circumplex) is invariant across gender although the distances between dimensions vary in different samples” (p. 12). Murray and Hall (2001) reviewed the vocational interests of undergraduate male and female students and career choice. The results showed that females possess a higher co-curricular interest than males in artistic and social areas. Males possess a higher co-curricular interest than females in realistic and investigative areas. The findings of this study are significant to the current one which sought to establish personality types across gender among first year undergraduate B. Ed students.

Martino et al. (1985) surveyed 68 resident life staff members academic major and level of satisfaction with the major. The Strong-Campbell Interest Inventory -SCII (1981) was used to determine the personality types. The authors found personality types and environmental types among the participants as follows; Realistic (20.4%; 5.5%), Investigative (1.8%; 9.3%), Artistic (5.6%; 3.7%), Social (25.9%; 25.9%), Enterprising (24.0%; 50%) and Conventional

(9.3%; 5.5%). 12% of the study participants had no dominant type. Whereas Martino et al. (1985) surveyed staff members academic major and level of satisfaction with the major using SCII (1981) to categorize them into the personality types, this current study employed Holland's RIASEC model to classify first year undergraduate B. Ed male and female students into their vocational personality types.

Glaser et al. (2003) used Holland's theory to make a comparison between adjudicated male adolescents at a regional youth detention center and non-adjudicated male adolescents at a local high school. Results from the study showed lack of differentiation of the six code types (RIASEC) among the adjudicated youth while two codes Realistic and Artistic were elevated. Glaser et al. (2003) concluded that "the significant disparity between the two groups could primarily be attributed toward the differences in environments" (p. 15).

The two codes were elevated due to a high value that was placed on "artistic expression" which is typical for those assessed as Artistic and "hands-on occupations which coincide with realistic occupations. This study is significant because it illustrates the extent to which different environments and different educational experiences can shape one's career orientation. This study differs from the present one because it was demographically limited as it focused on adjudicated male youths only while the present focused on both male and female undergraduate students.

Kniveton (2009) also found out that males placed Realistic type at the top of their list while Artistic type topped the female list. Wais et al., (2007) based their study on RIASEC and found that women tend to choose Artistic and Social careers unlike men who tend to choose Investigative and Realistic careers. Males had higher self-efficacy and were most likely to be Realistic, Investigative, Enterprising and Conventional type. The studies by Wais et al., (2007) and Kniveton (2004) are similar to the current study which also used Holland's (1997) RIASEC model to establish personality types across gender among first-year undergraduate students in the B.Ed degree programmes in a selected public university in Kenya .

Abdullah et al (2009) did their research in public universities in Malaysia and found that 70% males chose Realistic type, 75% females chose Social type while 62% females chose Artistic type. The authors further found that males prefer Investigative and Realistic types while females prefer Artistic, Social and Conventional types. Almiskry et al. (2009) conducted a study to determine the career interests of university students in Malaysia using two hundred

and thirty-eight undergraduates, found a significant difference on the realistic type interest pattern between male and female students.

The above studies by Abdullah et al., (2009) and Almiskry et al., (2009) although similar to the current study in population and scope of study; the authors did not investigate the enterprising-personality type resulting in an incomplete RIASEC model. The results however support the findings of one of the objectives of the current study which sought to establish personality types across gender among the first-year undergraduate students in the B.Ed programmes in a public university in Kenya.

A meta-analysis study by Su et al., (2009) examined gender differences in vocational interests in more than half a million participants, reporting robust differences in the interests of men and women. Men showed stronger preferences for Realistic and Investigative jobs. Women on the other hand had strong preferences for Conventional, Social, and Artistic occupations. This study is similar to the current one which also sought to establish personality types across gender among the first-year undergraduate B.Ed students in a public University.

Woods and Hampson (2010) conducted a longitudinal study examining association between childhood personality traits, gender and environment over forty years. Results showed that Realistic environments are strongly male-dominated and men who were less open/intellectual as children had higher Realistic scores as adults ($\beta = -.12$, $t = -2.43$, $p < 0.05$) but this association was not significant for women ($\beta = .04$, $t = 0.70$, $p = 0.48$). Conventional environments are strongly female-dominated, and we found that women who were less open/intellectual as children had higher Conventional scores ($\beta = .01$, $t = 0.27$, $p = 0.79$), but this association was not significant for men ($\beta = .01$, $t = 0.27$, $p = 0.79$). The finding for Enterprising was unexpected since men who were more Open/Intellectual as children ($\beta = .16$, $t = 2.96$, $p < 0.05$) had higher Enterprising scores but not women ($\beta = -.11$, $t = -1.83$, $p = 0.07$).

Woods and Hampson (2010) study is significant to this study as it provides longitudinal evidence that childhood personality traits predict occupational environments, a proposition supported by Holland's (1997) theory, although moderating pathways of vocational interests remain to be tested. Woods and Hampson (2010) conducted a longitudinal study on Holland codes showing their cause-effect on childhood traits. The present study however focused on

male and female university undergraduate students in the B.Ed programmes in a public university in Kenya.

Gitonga et al. (2013) explored the relationship between gender and classification of personality types using Holland's Self –Directed Search with 389 third year students at Kenyatta University. They found a significant relationship between gender and personality ($\text{mean}=34.962$, $df\ 5$, $p = 0.000$) that indicates a significant relationship between gender and degree programs. Upon examining the gender and personality types distribution the results showed that more than two-thirds of the students enrolled in Engineering and Sciences were male; (85.5%) and (63%) respectively, compared to the female students in Engineering (14.5%) and Sciences (37%). In the social sciences, there were more female students in Education (67%) compared to males (33%). Examining the distribution of students by gender in the personality types, the number of female students in an investigative field was slightly higher than the realistic field. These results imply that gender continues to play a key role in the choice of mathematics and science based subjects with majority of females avoiding these fields.

Whereas Gitonga et al. (2013) utilized third year university students as study population, the current study used first year students. Moreover, it examined the gender differences in personality types and the choice of degree programmes. Gitonga (2012) examined the relationship between gender and personality types. The chi-square results ($\text{mean}=34.962$, $df=5$, $p=.000$), suggested a significant relationship between gender and personality types. Gitonga's (2012) study is instrumental to the current study in a number of ways for instance, both used university students as respondents. The author also employed theoretical model and analytical tools similar to the ones used in the current.

Chemeli (2013) investigated the relationship between personality types and career aspirations among form three secondary school students in Eldoret West District. The highest percentage was recorded on the Enterprising personality type (29.1%), followed by the investigative type (24.4%). The Girls' personality types revealed majority being Enterprising (29.7%) followed by the Investigative type (22.8%). In mixed day Schools, the Investigative personality type had the highest percentage (31.8%) whereas Realistic type had the least (5.3%). The Artistic personality type has the lowest percentage (2.7%). The Investigative, as it is with the other schools has the majority of students (36.4%).

The almost absent realistic personality type is because of lack of environment to develop it, as it is assumed in majority of societies influenced by western formal education that realistic occupations, for example animal caretakers, cooks, technicians do not need much education. Majority of form three students were found to be investigative and this was attributed to the structured curriculum (8-4-4) that has accustomed the students into doing things in a specific manner. For example, the methodological approach adopted by teachers where examples are given followed by exercises for practice in mathematics, or demonstration of experiments by the teacher in the chemistry laboratory, followed by group work where students perform the practical under the guidance of the teacher. These methods of approach lead to the majority of students attaining the investigative personality type by the time they are in form three.

Migunde et al. (2011) explored gender differences in adolescents' career aspirations and career development barriers among 348 form four secondary school students in Kisumu Municipality, Kenya. The results showed that the types chosen by more females than males were Social career (86.9%), Conventional type (70.3%) and Artistic type (68%). Males scored higher on Realistic type (81.8%), Investigative type (52.6%) and Enterprising type (52.9%). The authors further found that the Investigative type is the most preferred by both males and females. However, the authors attributed the differences in personality types to socialization in different cultures where certain careers are not suited for particular gender.

Similarly, Migunde et al. (2011) investigated factors influencing career choice among form four secondary school students in Kisumu Municipality, Kenya. A sample of 332 students and 28 teacher-counselors participated in the study. Responses in each type by gender indicated Investigative type, males 44.3% and females 33.9%; Social type was most chosen by females (18%) and least chosen by males (3.2%). 14.2% females and 7% males chose Artistic careers. The Realistic type was mostly chosen by males (11.4%) and the least chosen by females (2.2%). Migunde et al. (2011) further reported that over 80% males chose Realistic careers while females were less than 20%. Over 50% males chose Investigative careers. More females chose Social career (80%), Conventional careers (60%) and Artistic careers (70%). The difference between Migunde's (2011) study and the current one is in the study population used. Whereas Migunde (2011) sampled form four students, the current one utilized undergraduate students in the B.Ed programmes in a public university in Kenya.

The comparative study by Glasser et al. (2003) demographically focused on adjudicated male youth only; Green's (2010) action research focused on female fashion students only hence

was demographically limited. In Nigeria Onoyase and Onoyase's (2009) did not address gender difference. In Kenya Chemeli (2013), Migunde (2011) focused on form four students while Gitonga (2012) focused on third year university students. Other authors like Migunde (2011) attributed the gender differences in personality types to cultural beliefs and socialization factors. This correlation study therefore employed Holland's Code (1997) theory to establish personality types across gender among the undergraduate first-year B. Ed students in a selected public university in Kenya.

2.5 Types of Intelligence across Career Choice among First-Year Undergraduate Students

Armstrong (2009) suggested that "the multiple domains of intellectual abilities have unique skills and occupational channels" (p. 11). According to Lenaghan (as cited in Shiruffudin 2010), "the interpersonal intelligence type is characterized by teaching, public speaking and leading" (p. 35). Wambugu (2010) asserts that "some information technology professionals spare much thought about communication skills because they share their ideas visually and use flowcharts, blueprints, satellite images, and schematics" (P. 6). The old field leader of a sports team might not require a particular high I.Q especially if he or she is "a talented athlete, experienced and knowledgeable of the sports" (Reggio et al., 2002). The epitomes of existentialist intelligence include "the scientist Einstein and early philosophers like Aristotle, Confucius, Plato, and Socrates" (Wilson, 2012).

A student endowed with multiple intelligence will seek an academic programme and courses congruent to his/her unique types" (Johnson, 2007, p.65). For example, the musically intelligent student will pursue a course to hone his/her music skills like playing musical instruments, singing, recognizing tonal patterns, remembering melodies, composing music and understanding the structure and rhythm of music. A bodily - kinesthetic Intelligence student will pursue programmes such as physical education and fine arts whereas a student with logical - mathematical intelligence uses reason, logic, numbers, intense questioning and experimentations in sciences and mathematics and problem solving (Advance CTE, 2020; Morris, 2012; Gardner, 2012.). Therefore, students training to be mathematicians or physicists spend years sharpening their mathematical intelligence in a distinctive and logically relevant way. According to Kerka (2012), "young adults with visual-spatial intelligence skills may be fascinated with mazes, jigsaw puzzle buildings, reading, writing, understanding charts and graphs, a good sense of direction, sketching, painting, drawing, and

creating visual metaphors and analogies, manipulating images, constructing, designing practical objects and interpreting visual images” (p. 13).

Teacher-trainees and history students need 3-D modeling and visualization to recreate historic characters while geography, physics and chemistry teachers can make these subjects interesting when teaching concepts like gravitational force and pressure using 3-D animation (Kariuki, 2011). Naturalist intelligence includes love for nature for example, university botanical gardens, environment friendly courses like geography, zoology, botany. In a university academic environment, a student with existentialist and intrapersonal intelligences portrays understanding, self-reasoning and knows his/her role in a relationship with others. Such students also excel in courses like research, philosophy and psychology. A summary of the types of intelligence and sample congruent careers is given in Table 2.1.

Table 2.1: Types of Intelligence and Sample Congruent Careers

Types of Intelligence	Congruent Careers
Musical	Musician, disk jockey, singer, composer, vocalist, music teacher, band director
Logical/ Mathematical	Accountant, engineer, scientist, researcher, computer programmer, mathematician, statistician, tax expert
Visual/ Spatial	Composers, conductors, music teachers, vocalists, musicians, songwriters, music directors.
Bodily/ Kinesthetic	Athlete, choreographer, dancer, music director, firefighter, artisan, P.E tutor
Verbal/Linguistic	Poet, journalist, public relations, writer, teacher, politician, lawyer, translator
Intrapersonal	Researchers, theorists, philosophers, psychologists
Interpersonal	Salesperson, counselor, teacher, nurse, politician, business person
Naturalist	Biologist, farmer, botanist, meteorologist, veterinarian
Existentialist	Preacher, philosopher, star reader, astrologer

Source: Gardner, 2012; Shearer & Luzzo, 2009; Advance CTE, 2020.

<http://www.Ipride.net/learningstyles.mi.htm>

Students of Criminal Justice at the University of West Florida participated in a study to identify what career might best suit them, based on the strength of their multiple intelligences. The participants were female ($n=110$ or 58.8%) and males ($n=77$ or 41.2%). The MI results showed that 65% ($n=115$) of participants indicated strengths in intrapersonal intelligence, which Johnson and White (2002) attributed to the strength of being self-reflective and an awareness of one’s internal state. Johnson and White (2002,) concluded that criminal justice careers would suit persons with intrapersonal intelligence. According to

Johnson and White (2002), the strength in verbal-linguistic skills could benefit females who seek a career as attorneys however, it could be considered a weakness for those who did not select it and are seeking a career in law enforcement.

The Johnson and White (2002, 2007) study is significant because it can assist students in determining their Multiple Intelligences, strengths and weaknesses and a self-identified occupation. Johnson and White (2002) used survey method while the present study employed ex-post facto design to establish types of intelligence across career choice in the B. Ed programme among first-year undergraduate University in Kenya.

Chan (2003) explored the consistency between Chinese secondary school teacher's areas of responsibilities and their types of intelligence and his findings reported relative weaknesses in visual-spatial and bodily-kinesthetic intelligences. Arts/music and sports teachers were reported to have greater strengths in musical intelligence. Chan (2003) reported greater strength in intrapersonal intelligence as portrayed by teachers of guidance and counseling. The study by Chan, (2003) focused on a specific demographically limited population namely the Chinese secondary school teachers. On the contrary, this study is significant to the current one as it showed strong relationship among the types of intelligence and careers as postulated by Gardner (2006) and Armstrong (2009).

Further, Shearer (2009) explored the relationship between intrapersonal intelligence and university students' career decision making, retention and academic success. The sample consisted of 82 participants (49 females and 33 males). ANOVA showed that the largest scale differences were for the Intrapersonal and Math/Logic scales which were both 12% points lower for the career exploration group. The lower academic skills scales reported were Linguistic and Logical-math (-7%). According to Shearer (2009) this indicates that there is a moderately strong relationship between one's self-knowledge and degree of career clarity. The study by Shearer (2009) focused on one type of intelligence namely intrapersonal while other types of intelligences like existentialist and naturalistic have been addressed by the current study.

Matto et al. (2006) conducted an exploratory study at Virginia Commonwealth University to determine faculty perceptions of the importance and effectiveness of MI when used for social work practice and education. Participants were 91 faculty members. The authors found that interpersonal (79.4%) was considered important to the participants. With regard to the degree

of effectiveness, both linguistics (79.2%) and intrapersonal (64.0%) were highly ranked, and the lowest degrees were indicated by spatial (7.8%) and logical mathematic (8.0%). Matto et al. (2006) conducted an exploratory study to determine perception and the effectiveness of MI when used for social work practice and education This study is similar to the current one in the sense that both investigated the different types of intelligence however, while the former was an exploratory study the latter was a correlation one that sought to establish types of intelligence and career choice among undergraduate first year B. Ed students in a selected public university in Kenya.

Alghazo et al. (2009) investigated the types of multiple intelligences in social studies, Arabic and English books for the first three grades. The results of the study showed that most common type of intelligence in all the three books and grades was visual-spatial intelligence (Social studies=33.4%; Arabic = 46.14%; English=57.9%). The least common type of intelligence is the physical (Social studies=5.6%; English=3.2%). The researchers further used to find out the correlation between subject, type of intelligence and grade.

The chi-square results showed Social studies ($\chi^2=192.255$; $df= 8$); Arabic language ($\chi^2=192.255$; $df= 8$) and English language textbooks ($\chi^2=192.255$; $df= 8$).The difference in distribution of the varied multiple intelligences in the books was attributed to the nature of the subject hence the varied percentages from one grade to another. The study by Alghazo et al. (2009) is significant to the present one because textbooks are the key tools of content analysis in training programmes hence the types of intelligence.

Lin (2009) examined gender and other differences in self-estimates of multiple intelligences among 411 pre-service teachers drawn from university departments. The Chinese literature department participants self-estimates of verbal-linguistic intelligence ($F=3.04$; $p < .001$) were higher while industrial education, mathematics, chemistry, physics departments participants self-estimates of mathematical-logical intelligence ($F=13.66$; $p<0 .001$), were higher. The Arts department participants self-estimates of visual-spatial intelligence ($F=6.55$, $p< .001$) were higher.

The physical education department participants self-estimates of bodily kinesthetic intelligence ($F=3.3.43$; $p<.001$) were higher. Participants from biology and geography departments self-estimates of naturalistic intelligence ($F=2.79$; $p<.001$) were higher compared to estimates of mathematics. There were no significant differences in musical-

rhythmic, interpersonal, and intrapersonal intelligences among different departments. The study is instrumental to the current study as it showed how types of intelligence are aligned to specific subject areas offered to pre-service teachers within university academic departments.

Serin et al. (2009) examined the relationship between the teaching styles and the multiple intelligence types of primary school teachers in Izmir in Turkey and Lefkosa in Cyprus. Simple random sampling was used to draw a sample of 140 (57%) female and 105 (42.9%) male primary teachers. The results showed significant statistical differences between the following sub-scales; Verbal-linguistic ($t=8.766$; $p < 0.001$), Logical-mathematical ($t=11.021$; $p < 0.001$), Spatial-visual ($t= 11,153$; $p < 0.001$), Naturalistic ($t= 9.987$; $p < 0.001$), Musical-rhythmic ($t = 6,033$; $p < 0.001$), Bodily-kinesthetic ($t = 4.944$; $p < 0.001$), Interpersonal ($t=4.802$, $p < 0.001$) and Intrapersonal ($t=4.133$, $p < 0.001$). The authors attributed the differences to teachers working in Cyprus (Lefkosa) where the primary programmes have been appropriately prepared to conform to the varied intelligence fields. Since teaching styles form a core component of B. Ed programmes, the study by Serin et al. (2009) is important as it reflect the activities, tasks and practices expected of each B. Ed programme as a career choice.

Ghazi et al. (2011) investigated the relationship between students self-perceived multiple intelligences and academic achievement of 714 male and female first year students enrolled in all government degree colleges in district Bannu in Pakistan. The study found significant correlation between self-perceived verbal/linguistic ($r = .26$; p . value $= .00$ at 0.01 level), logical/mathematical ($r = .42$; p . value $= .00$ at 0.01 level) and students' academic achievement. However, insignificant correlation was found between perceived musical intelligence and academic achievement ($r = .05$; p . value $= .14$ at 0.01 level) and very weak correlation between bodily/kinesthetic intelligence and academic achievement. ($r = .12$; p . value $= .04$ at 0.01 level). The finding by Ghazi et al. (2011) is significant to the current study because entry and progress in the degree choice under investigation are determined by academic achievement an examination tests scores.

Green (2010) using a sample of twelve first quarter fashion students investigated the perceptions of usefulness using Holland Code theory and MI theory to determine their career niche in the fashion industry. The researcher found that all the student participants were able to make a connection with their MI strengths. This means that the participants also selected careers which reflected their unique skills and interests. The study by Green (2010) was

characterized by small sample size among demographically limited American population and did not address other types of intelligence like existentialist and naturalistic. Further, it focused on females fashion students only while the current study included both males and females B. Ed students in a in a selected public university in Kenya.

Hanafiye (2013) further scrutinized whether there is a significant relationship between a particular type of intelligence and success in grammar, listening and writing. Results show that there is a low positive relationship between writing scores and musical intelligence ($r=.182$, $p<.033$). The analysis also indicated some negative correlations in the following intelligences: bodily- kinesthetic ($r= -.166$, $P<.049$), intrapersonal ($r=-.183$, $P<.031$), and spatial ($r=-.172$, $p<.042$) had low negative correlations with student's grammar test scores.

Although Hanafiye (2013) correlated a particular type of intelligence and success in grammar, listening and writing using Pearson correlation coefficients (*Correlation is significant at the 0.05 level (2-tailed), the study revealed some degree of low positive correlation between student grammar test scores and specific intelligence types. This finding supports the current study's assumption that students may possess overlapping types of intelligences in varying degrees.

Yamin (2013) conducted a study to investigate the types of mathematical thinking and its relationship with some variables. It sought to identify the relationships between the intelligences among 10th graders in Toolkarem governorate. The study sample consisted of 395 male and female students in the second semester of 2012/2013 academic year. The results showed that the participants possess all the intelligences in varied levels. The interpersonal intelligence ranked first while the spatial intelligence ranked last. The ratio of the students who chose the scientific stream was 35% while that of those who chose the humanity sciences was 65%. This study is significant to the present one as both studies sought to establish the dominant types of intelligence and less dominant types of intelligence across B.Ed programmes. The findings revealed that the participants possessed all the nine types of intelligences in varied levels with some most dominant while others were less common.

Öztürk et al. (2014) examined the emotional Intelligence characteristics of students studying at various faculties and colleges of universities. Accordingly, faculty of science and letters has the highest average of wellbeing (5.31) and School of Tourism Management has the lowest average (4.99). Faculty of Science and Letter also has the highest average (4.80) in

terms of self-control whereas the Faculty of Fine Arts has the lowest average (4.43). The Faculty of Economics and Administrative Sciences (5.30) and that of Science & Letters (5.30) have the highest averages in emotionality factor and the Faculty of Fine Arts has the lowest average (4.97). Faculty of Science & Letters (5.24) and Fine Arts (5.22) have the highest averages in sociability factors whereas the Faculty of Economics and Administrative Sciences has the lowest average. This study by Öztürk et al. (2014) is relevant to the current study since it examined emotional intelligence which falls within the realms of interpersonal and intrapersonal intelligences which are within the nine intelligence types (Lumei & Turda, 2022) The point of divergence between Öztürk et al. (2014) and the present study is that while the former focused on only two types of intelligences, the latter examined the nine multiple intelligence domains.

Mustafa et al., (2014) found significant differences on the mean scores of the study sample on the rest of the intelligences attributed to the college variable in favour of science based colleges on the logical- mathematical, visual-spatial, and naturalistic intelligences and in favour of humanity colleges on the interpersonal, intrapersonal, verbal-linguistic, musical-rhythmic and existential intelligences. The authors explained that this is perfectly understandable on the grounds that most students are in the science based colleges by virtue of their logical-mathematical intelligence.

The study by Mustafa et al. (2014) which compared science based colleges and those of humanities with regard to the types of intelligences that students in such colleges possess is similar to the constructs the current study sought to establish .The findings which are significant to this study revealed that science based colleges focus on scientific concepts, methodologies, activities and skills through a wide range of tools based on scientific thinking, reasoning, evidence, and experiments.

Gallup Africa International (2012) conducted a study on the status of higher education in Kenya. The sample interviewed were five hundred students in public universities. The survey revealed that 94% of public university students are allocated courses that were not of their choice while 85% were not studying degrees of their selection despite scoring well in KCSE. Only 3.9% were allocated studies of their choice mainly in medicine, law, engineering and commerce. This therefore means that majority of students end up in degree programmes they are not passionate about hence public universities are busy churning out graduates who

studied subjects that they don't care much about. This finding is instrumental because it provides a significant gap for the current study.

Karugu and Otiende (2012) conducted a survey of graduates of Kenyatta University (1985 - 1995). This study focused on bachelor of education degree graduates (females 48%; males 52%) who graduated in the year 1995 and were teaching in various secondary schools in Kenya. The authors reported that respondents chose the following abilities and skills in order of importance as expected at the work place: sense of responsibility; self-confidence; ability to solve problems and perform reliably and initiative. This study is similar to the current one because the abilities and skills identified during the survey constitute the subscales of different types of intelligence that are the main focus of the current study. This study further sought to align the abilities and skills surveyed by Karugu and Otiende (2012) to specific multiple intelligence profiles.

There has been a growing interest in the application of multiple intelligence theories in the educational settings. Apparently no attention has been given to exploring multiple intelligence among students at any level of education system in Kenya where career decision making is critical. Many studies like Shearer (2009), Wilson, (2012), Shearer, (2006), Green (2010), Shiruffudin, (2010), and Ozgen et al. (2011) which focused on specific multiple intelligences among the Europeans and Asian populations. It was therefore important to determine the degree of relationship between the types of intelligence and career choice among first-year undergraduate B.Ed students in a selected public university in Kenya.

2.6 Personality Types across Career Choice among First-Year Undergraduate Students

The Holland code career model “matches personality with a vocational environment” (Toomey et al., 2009; Hollandcodes.com, 2012; Career Keys; 2023). The codes can ‘reflect both the individual and the occupation that is most congruent’ (Hollandcodes.com, 2012). Students within a university seek an academic environment that “provides them with an opportunity to pursue a degree program that will exploit their dominant personality attributes. These academic environments need to be conducive for the effective development of different degree programmes dominated by varied personality types. For example, a social environment promotes social personality types” (Holland, 1997).

According to Holland's (1997) theory, “people tend to be most productive when there is a seamless connection between their personality types and their careers hence people look for

environments which allow them to exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles (p.76). Holland's theory proposes that people express their personalities while choosing a career. (Greenhaus et al.,2019). Therefore, "a good match between a person's interest and occupational type is a critical concept underlying occupational stability, satisfaction and longevity" (Cotter & Fouad, 2011; Woods & Hampson, 2010).

Holland (1997) argues that "people with specific vocational personality types are attracted to activities and occupations associated with those types, and they demonstrate behavioural repertoires, patterns of likes and dislikes, and concordant attitudes and values that support their developing interests" (p. 78). This argument is corroborated by Kemboi et al. (2016) who stress the fact that "the choice of an academic course is influenced by the unique personality types that students possess" (p. 9).

Disciplines commonly associated with realistic environments are electrical engineering, mechanical engineering and military science. An investigative degree program emphasizes the acquisition of knowledge through investigation and problem solving. Some of the disciplines that are considered investigative are biology, mathematics, sociology, economics, physics, economics and civil engineering (Gitonga, 2012). Artistic disciplines include English, Literature, architecture, Music, and Theatre. The emphasis is on ambiguous, free, and non-systematic activities that involve emotionally expressive interactions with people.

Disciplines that are commonly associated with social environments are Education, Political Science, Nursing, Special Education, Philosophy and History. Social degree programmes focus on activities that involve mentoring, treating, healing or teaching. Students who undertake training in the social degree programmes "feel rewarded for displaying empathy, humanitarianism, sociability and friendliness" (Gitonga, 2012).

Enterprising degree programme is oriented towards personal or organizational goal attainment through leadership or manipulation with the emphasis being on leadership development. Enterprising disciplines include Business, Journalism, Communication, and computer science. Lastly, "the conventional degree programme has courses such as accounting and data processing that focus on competencies associated with the use of numbers or machines" (Furnham et al., 2005). The Personality types and sample congruent careers as postulated by Holland's typologies are presented in Table 2.2.

Table 2.2: Personality Types and Sample Congruent Careers

Personality Types	Sample Congruent Careers
Realistic	craftsman, policeman, P.E teacher, Fitness trainer, engineering, computer technician, gardener, farmer, forestry
Investigative	biologist, chemist, historian, researcher, geologist, doctor, actuary, tax expert, mathematician
Artistic	artist, musician, cosmetology actor, dancer, designer, writer, photographer, painter
Social	teacher, clergy, coach, therapist, nurse, counselor, pastor, audiologist, babysitter, social worker, foreign service
Enterprising	manager, producer, lawyer, entrepreneur, marketing executive, principal, public health, salespeople, public relations, catering, insurance, law, politics, communications
Conventional	accountant, banker, editor, office manager, librarian, reporter, actuary, administrator, secretary

Source: Ahmed et al (2019), Advance CTE. 2020; Career Keys; 2023.

Several studies have found personality types to be predictive of student's choice of a degree programme as presented by Holland's typology (Kamuri, 2010; Onoyase & Onoyase, 2006; Porter & Umbach, 2006; Kemboi, et al. 2016; Zainudin, 2020).

Vigna (1996) explored Holland's codes for a sample of 1,000 interior designers to determine the primary, secondary, and tertiary types and job satisfaction. The author found that the most common primary code for interior designers was Enterprising; the most common secondary code was Social, and the most common tertiary code was Artistic. Job satisfaction was most closely linked to interior designers who did possess the primary and secondary codes of enterprising and social. This study is significant because it links a specific occupation to only three Holland's typologies to job satisfaction. It however differs from the present study which sought to establish the entire RIASEC typologies across career choice among undergraduate first year B.Ed students in a selected public university..

Helwig and Myron (1997) examined the stability of Holland codes over a decade across three generations to explore compatibility between family members and significant others. They further showed that first- generation family members were strongly Realistic, a personality type that was attributed to a rural environment and acceptance of a farming lifestyle, while third-generation family members were influenced more by urban lifestyle. The researchers concluded that the social code had replaced the Realistic one as the family code, with an increase in the Investigative code, which researchers attributed to the latest generation's

attainment of a higher education. This study is significant because it showed how attainment of higher education and societal factors could determine typology, and ultimately one's career choice.

Miller (2003) sought to determine the congruence between parents' occupation and 58 graduate students' career interests using the Self-Directed Study (1997). The parents' Holland code was determined by their recent occupations if they were retired. Results showed a mean of 9.2 between fathers and sons and 11.5 between mothers and daughters, which according to the researcher was a moderate degree of congruence between parents, their offspring and personality types. This study is significant because it indicates that approximately 10% of children are likely to get into occupations that are similar to those of their parents whose attributes they copy. While Miller (2003) study utilized SDS and the population was made up of parents and their graduate children, the current study employed an adapted version of questionnaire modified from Holland's SDS among first year B.Ed students.

Hogan and Holland (2003) evaluated the links between job performance and personality types by using a socioanalytic theory and meta-analysis to evaluate the links. An examination of 43 studies on the Holland code revealed that Realistic occupations represented 66.7%, Conventional 13.4%, Enterprising 11.1%, Social 4.6%, Investigative 3.0%, and Artistic 1.2%. The authors concluded that the actual number of occupations held is representative of the number of articles researched, meaning there were no limitations reflected on the Investigative and Artistic occupations. The study by Hogan and Holland (2003) is different from the present study because it evaluated job performance and personality types using socioanalytic theory. However, it is similar to the current study in the sense that it also investigated personality types across career choice based on Holland's model.

Pike (2006) determined vocational preferences and college degree expectations among undergraduate students. 396 females (62.8%) and 235 (37.2%) males participated in the study. The MANCOVA indicated a statistically significant effect for the Holland typology ($F=7.25$; $df=25, 3505$; $p<0.001$) and a statistically significant indication was noted between the Holland typology and degree of congruence ($F2.12$; $df=50, 4304$; $p<0.001$). However, the main effect for the degree of congruence was not statistically significant ($F=1.44$; $df=10, 1886$; $p>0.05$). These findings showed that Science Mathematics scale and Investigative students showed the highest expectations and were highly congruent with Investigative typology. For the Artistic and Cultural Experiences scale, the Artistic students showed the

highest level of expectation which was also highly congruent with Artistic typology. Pike's (2006) finding is significant to the current study as it revealed that students are likely to select degree majors that reflect their personality types.

Porter and Umbach (2006) found that the choice of an academic major is influenced by a student's pattern of interests. They concluded that assisting student's make informed career decisions on the selection of degree programmes promotes greater student satisfaction and success in their undergraduate experience. Feldman et al., (2004) found that the likelihood of students increasing their initial prominent characteristics over a four-year period of study is largely a function of whether or not they choose an academic environment that is consistent with their dominant personality types at the time they entered college. They also concluded that the prevailing academic environment has an influence on personality types. Similarly, the present study sought to determine if the B. Ed programme presents an environment that are aligned to typologies exhibited by students admitted in specific programme.

Green (2010) sampled twelve first quarter female students studying fashion to investigate the perceptions of usefulness using Holland's Code theory and MI theory. The aim of the study was to determine the students' career niche in the fashion industry. Green (2010) found that all student participants were able to select careers which reflected their Holland Code. Although the career choice in Green's (2010) study was career choice in fashion design using female students only, the current study involved career choice among male and female students in B.Ed degree programme. Further, both studies sought to establish personality types across career choice using Holland (1997) RIASEC model.

Wilhelm (2012) examined the relationship of Holland's theory of vocational personalities (RIASEC) to Miner's entrepreneurship types (Personal Achiever (PA), super sales people (SS), Real Manager (RM), Expert Idea Generator (EIG) and Complex Entrepreneurs (CEs). Holland's (1997) six- dimensional vocational model is premised on a match between individuals and occupations while Miner's (1996) contends that the different types of entrepreneurs have distinct personalities. Results showed that Holland's E type and Miner's RM Route are significantly positively related ($r = 0.402$, $p = 0.000$). RM is also significantly positively related to S ($r = 0.278$, $p = 0.01$). S also relates significantly positively with Miner's SS ($r = 0.363$, $p = 0.001$) and RM ($r = 0.278$, $p = 0.01$). Holland's E type relates significantly positively with Miner's composite measure of entrepreneurship, CE, ($r = 0.391$,

$p = 0.000$). Holland's S type scores were also significantly positively related with Miner's CE ($r = 0.382, p = 0.000$).

This study suggests that more entrepreneurs may be drawn from the social and artistic type majors in colleges significantly raising the pool of workforce which traditionally depended on entrepreneurship students only. This suggestion is critical to the present study as it attempts to relate entrepreneurship and personality psychology fields and the implication of such a relationship to the process of placement.

Ktoridou et al (2014) conducted a study in Cyprus in which the compatibility between undergraduate students' personality types and their study major was measured in order to estimate the extent to which students study a major that fits their personality types. To measure the fit between personality and major of study, the author used Holland's Occupational Themes. The results revealed that in four schools over 50% of the students personality types were found in a corresponding academic environment.

For instance, the School of Sciences was dominated by Investigative types (63%), School of Creative and Performing Arts dominated by Artistic types (57%), School of Education dominated by Social Types (61.9%) and the School of Economics dominated by Conventional types (48.7%). These results show that the social type represented the largest group (61.9%). The study by Ktoridou et al. (2014) is significant to the current study as it measured undergraduate student's personality types and their study major, a construct the current study also sought to establish.

Onoyase and Onoyase (2009) investigated the relationship between personality types and career choice of secondary school students in federal government colleges in Nigeria. The researchers used a sample of 616 senior secondary students who responded to two instruments on personality and career choice. The results showed that there was a significant relationship between Social (coefficient value=0.65; critical r value=0.20), Enterprising (coefficient value=0.04; critical r value=0.22) and Investigative (coefficient value =0.05; critical r value=0.22) personality types on one hand and career choice on the other. However, no significant relationships were found between Realistic (coefficient value=0.15, critical r value=0.30) and Conventional (coefficient value=0.57, critical r value=0.29) personality types and career choice. However the two studies differ in scope and population as Onoyase

and Onoyase (2009) utilized secondary school students the current study was conducted among undergraduate students in a public university in Kenya.

Similarly in Nigeria, Fred (2012) conducted a study on the relationship between personality characteristics and vocational choice using Holland's theory. The findings of the study showed that 70% of the population had personality types that were congruent with their career choice, a finding in support of the fourth objective of the current study which sought to establish the personality types across career choice among first-year undergraduate students in the B.Ed programmes in a public university in Kenya.

The Government of Kenya (G.O.K) (2007) conducted a study using a random sample of 22 schools to determine career guidance practices in Kenyan high schools. The study adopted Meyer-Briggs Type Indicator (MBTI) to group personality types and job categories to develop an appropriate college course admission model to solve the problem of colleges placing students in courses not suited for them and the subsequent mismatch between professional occupations and personality interests. The study further showed that the premise to be used in personality analysis to diagnose one's natural career is that human performance in a job situation is primarily dependent on one's ability to comprehend certain unique cognitive concepts demanded by the job situation and one's natural disposition towards certain tasks and environments.

Although the G.O.K (2007) study adopted Meyer-Briggs Type Indicator (MBTI) among practicing teachers, it is important to the present study based on Holland Codes (1985) which aimed at establishing personality types across career choice among students in a public university. This is so because students have been wrongly placed in courses thereby leading to the subsequent mismatch between professional occupations and personality interests.

Basing her study on Holland codes, Migunde (2011) grouped the students' career choice into six based on RIASEC. The results were analyzed and the findings showed that the most preferred careers were Investigative 40%; Enterprising, 25%; Artistic 11%; and lowest were Conventional 7% and Realistic 7%. Migunde (2011) further reported that over 80% males chose realistic careers with less than 20% of females choosing the same. Over 50% males chose investigative careers while more females (80%) chose social career; Conventional careers (60%); and Artistic careers, (70%).

The author found that more than 70% career choice made by form four students were influenced by their interests. Although Migunde (2011) sampled secondary school students, the study examined how students select subjects in high schools that eventually lead to the degree programmes pursued at the university which is crucial for the present study in comprehending the relationship between a student's interest and the degree programme they are placed in a public university.

Kemboi et al. (2011) investigated the relationship between personality types and career choice of underground students of Moi University. The authors utilized the Holland Occupational Finder Checklist to categorize the degree programmes into career choice according to Holland's RIASEC. The results were analyzed using chi square and percentages. Analysis by percentages revealed that the highest personality type was Realistic (95.4%) while the least represented was Artistic (8.3%).

The authors attributed the low representation to the sampled degree programmes not linked to machines, tools and practical materials. Furthermore, the subjects like fine arts, home science, economics that would enhance development of these personality types were made optional in high school curriculum. Whereas the study by Kemboi et al. (2011) established significant relationship between personality type and career choice, it is significant to the current study which sought to establish personality types and career choice among undergraduate students in a selected public universities in Kenya.

Gitonga (2012) examined the distribution of personality types in different schools at Kenyatta University, Kenya. Results indicate that in four schools over 50% of the students' personality types were found to correspond to the academic environment. They include School of Sciences dominated by investigative types (63%), School of Creative and Performing Arts dominated by Artistic types (57%), School of Education dominated by Social Types (61.9%) and the School of Economics dominated by Conventional types (48.7%).

However, the School of Engineering was dominated by enterprising type (33.9%) instead of the realistic types and school of Business was dominated by Artistic type (34.8%) as postulated by Holland (1997). The results imply that the personality types influenced the choice of degree programs at Kenyatta University, a result which would act as proxy data to the personality types and career choice among first-year undergraduate students in the B.Ed degree programmes investigated in the current study.

Although the chi-square results (mean=389.753, *df* 25, *p* = .000.) in Gitonga's (2012) study revealed a significant relationship between personality types and choice of degree program, the study did not display significant relationship specific to each personality type. The generalization of relationship between personality type and career choice made sweeping assumptions that would have ignored the specific relationship of each personality type and career choice. This is because according to Holland codes theory each typology matches with a vocational environment. This study therefore differs with the study by Gitonga (2012) as it sought to establish personality types across career choice in the B.Ed programme in a selected public university in Kenya.

The G.O.K (2012) commissioned a task force on the re-alignment of the education sector to the new Constitution 2010 and vision 2030. The specific reason for reviewing of the education structure was to provide an opportunity for early identification and nurturing of talents in learners in order to establish a system that is not exam oriented. The commission observed that examination based certification pervades each cycle of education leading to a small number (28.4%) of those qualified to join university.

Similarly, the G.O.K (2012) found that most teacher trainees do not choose teaching as a first choice a finding that cuts across all levels of teacher training and recommended the vetting of all trainees to establish their interests in teaching as career. One of the recommendations of the study was that KCSE applicants joining teacher training colleges for primary school teacher training should indicate their interests and motivation (G.O.K, 2012).

Kimani and Kinyanjui (2012) assessed the effectiveness of the B. Ed (Arts) programme in meeting the job needs of graduates of University of Nairobi. A sample of 1170 graduates was drawn through snowball technique and their findings showed low rating of teaching career and the overall rating of job satisfaction was poor. This finding was critical to the current study whose assumption is that the target population of this study was admitted to train in B. Ed programmes as their ultimate career is teaching.

Karugu and Otiende (2012) surveyed the graduates of Kenyatta University (1985 –1995) and found that the decision to enroll in Bachelor of Education degree courses is to a large extent and importantly influenced by availability of the courses, admission cut-off points, future career prospects, reputation of the university and advice from teachers, parents and guardians. The survey is significant to the present study as it recommended that career counselors should

help students determine the most suitable careers based on their abilities, capability and interests. The knowledge on typologies in occupationally rewarding environment would boost career guidance practice by providing complementary information to career counselling services, training and research knowledge.

Chemeli (2013) tested the hypothesis that there is no significant relationship between personality type and career aspiration. The researcher used a sample of 429 participants from 12 secondary schools in Eldoret west district. A survey on the career aspirations showed that the one with the highest number is the Investigative (140; 32.6%) followed by the Enterprising (92; 21.4%), Artistic (53; 12.4%), Social (53; 12.4%), Conventional (52; 12.1) and the least was Realistic (39; 9.1%). Overall, majority of students (32.6%) aspired for Investigative careers, followed by Enterprising ones (21.4%). Out of 429 students that were interviewed, 140 had Investigative career aspirations. This number was attributed to the science-oriented curriculum that has prompted the students in secondary schools to have such interests.

Njoroge (2017) attributed the serious shortage of professional skills to “failure by universities to help students chart credible career paths”. The student selection to join the university is based on the subject cluster points, academic performance and the university capacity for specific courses. Even though students are required to make a choice of a degree program they intend to pursue in the universities at high school, there is no documented study to show whether the students are admitted to the courses they prefer most. This provided a significant gap for the current study which sought to establish personality types across career choice among first year undergraduate students in a public university in Kenya.

The personality variable with regard to career choice has been widely researched using varied theoretical frameworks, population and designs (Garcia-Sedan et al., 2010). For instance, G.O.K, 2012 utilized MBTI; Hogan and Holland (2003) utilized socioanalytic theory. Hall 2010, Tang et al., 2013 Chemeli (2013) and Migunde (2011) utilized secondary school students as study population. Almiskry et al., 2009; Gitonga, 2012 and Kemboi et al., 2016 employed Holland (1997) model and focused on personality types and gender among undergraduate students.

The study population in Gitonga’s (2012) study were third year students who had settled in their degree choice and harmonized their interests to training activities and environment

unlike the first year students under the current study who had just been placed in a degree programme and were probably facing turbulence and with little self knowledge to match their personality interests and career choice. Muraya (2011) also showed that students in Kenya suffered career indecision due to lack of appropriate policy on placement. This study sought to establish personality types across career choice among first-year undergraduate students in the B. Ed programmes in a in a selected public university in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in this study. It commences with a description of the research design and locale. This is followed by a discussion of the major variables that were derived from the objectives of the study. The chapter then discusses the target population and sampling strategies used to get the subjects that participated in the study. The types and justification of the research instruments is discussed in line with the strategies used in data collection and analysis. The chapter ends with a discussion of the combination of methods that were used to analyze the data and issues generated by the study.

3.2 Research Design

An ex-post facto and descriptive survey research designs were adopted for this correlation study. The two designs therefore complemented each other in examining the variables under study. In ex-post facto design, the researcher attempts to determine the relationship and not causation. Ex-post facto design was considered appropriate for this study because the independent variables under investigation especially the gender of respondents, types of intelligences, personality types and degree programs had already been determined and could not be manipulated (Orodho, 2012). Ex-post facto design has been supported in educational research which does not lead to experimental work (Frankel & Wallen, 2008).

The study also adopted a descriptive survey method for this research. Such a research describes a situation to reveal relationships between phenomena (Cepni, 2009; Mugenda, 2011; Orodho, 2009, 2012). The survey design was also appropriate since the study relied on individual student's self rating and opinion and not on scientific intelligence and personality experiments or tests. According to Cherry (2013) descriptive surveys are fast, cheap, easy and more flexible.

3.3 Area of Study

A fully-fledged university public university in Kenya (Appendix E) was purposively selected as the study area. The university was founded in 1990 as a university college and became a fully-fledged public university in the year 2000. It is located in Nyanza province, Kisumu County, Kisumu West Sub County, along Kisumu-Busia road and sits on the equator. The public university lies between coordinates 0⁰01' 00''S and 34⁰ 36' 00''E. The area receives annual rainfall of about 1400mm per annum and temperature range between 20⁰C-30⁰C. . For

nearly two decades, the public university has offered quality undergraduate B. Ed programmes in a wide range of subjects in linguistics, humanities, mathematics and sciences and creative arts studies. This could be attributed to the tradition of high quality teacher training standards set by the precursor, the Siriba Teachers Training College.

The choice of the public university was influenced by the typical similar nature of public universities in Kenya hence was chosen to act as a proxy to other public universities in Kenya. The student population at a public university is similar to all other public universities in that majority of them are admitted and the data generated is a proxy to the population in other public universities. The public university was also purposively selected for this study because it is composed of a diverse student population from across the country giving it a multicultural and multiethnic student population of about 5000 (Academic Division, 2017) .

The B.Ed programmes were purposively selected because of similarity with other programmes in other public universities in terms of curriculum design and expected outcomes. Furthermore the IT component The IT component gives the university B.Ed programmes a unique curriculum design hence act as a market leader in Kenya (Njoroge, 2019). The IT component also provides an interface with skills and abilities normally postulated by human intelligences such as visual spatial, speech and languages and decision making. In addition, the university has a long history of offering unique courses like fine arts and music, which according to Gardner (1983) and Holland (1997) fall distinctly under the bodily-kinesthetic and artistic fields. For this reason, the researcher felt that the university B.Ed degree programmes classification fitted well within the Gardner's (1983) and Holland's (1997) models. Apparently, they may have remained untapped or assumed in university B.Ed. training and research.

According to World Universities Ranking (2011), the university was ranked number 5807 among the top 14,131 recognized universities in the world (Webometrics, 2023). The university is also a member of the Association of Commonwealth Universities and African Universities. The university is ranked position 207 out of 1,104 recognized universities in Africa and number 12 out of 63 among the recognized universities in Kenya (Webometrics, 2023).

3.4 Study Population

The study population included all the 490 (289 males and 201 females) first-year undergraduate students at the School of Education, main campus during the 2016/2017 academic year. (Academic Division, 2017). The females were 41.02% of the total student's accessible population and males were 58.98%. The actual number of students fluctuated with admissions, transfers, course revisions and drop outs (Academic Division (2017). The population was represented in the programmes as follows; B.Ed-Arts with IT 54.08%, B.Ed- Sciences with IT 26.33%, B.Ed-Special Needs with IT 5.31%, B.Ed-French with IT 8.57% and B.Ed- ECDE with IT 5.71%.

First year undergraduate B.Ed students were selected for this study because they form one bipolar end of university degree choice characterized by career turbulence of entry-change verses exit-recurring. First-year students have also not stabilized in the degree program and face unexpected career turbulence, uncertainty and indecisiveness hence are likely to change or drop out. Universities also tend to periodically remodel or restructure their programmes and courses with the intention of tailoring them to the training designs to the needs of incoming first year students. Consequently, first year students may be faced with career uncertainty due to the turbulent career paths stretching from as early as form one in secondary school. Lastly, B.Ed. students are a representative group in all disciplines be it sciences, humanities or languages.

3.5 Sample Size and Sampling Technique

First, a sample size of 220 B.Ed students was obtained using a formula developed by Israel (2013) as shown;

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n = required sample size

N = the target population

e = the derived level of precision (sampling error at 0.05)

$$n = \frac{490}{1 + 490(0.05)^2}$$

n = 220

The sample size (n = 220) is acceptable as Gay et al. (2007) recommend "a minimum sample size of 30 in establishing the existence or non-existence of a relationship in a correlation

study” (p. 34). In the event of cohorts with large samples obscuring the data electiveness, smaller cohorts like B.Ed.-Music with IT was treated within B Ed.-Arts with IT. For example, B.Ed-Music with IT sometimes registers as low as five students. .The programmes were lumped due to similarities in subjects offered, and activities within related course units. This is an assumption borrowed from other related studies (Chemeli, 2013; Gitonga, 2012).

First, a sample size of 220 B.Ed. students was obtained. Proportional stratified sampling was then used to ensure that students from the five cohorts or subgroups under the School of Education are adequately selected and represented in the sample in proportion to their number in the population hence maximizing the likelihood of representativeness (Kombo & Tromp, 2006). The sample size is shown in Table 3.1.

Table 3.1: Sample Size

Programme	Number of Students			Sample Size
	M	F	t	
B.Ed – Arts	155	110	265	$265/490 \times 220 = 119$
B.Ed –Science	87	42	129	$129/490 \times 220 = 58$
B.Ed –ECDE	11	15	26	$26/490 \times 220 = 12$
B.Ed –Special	24	18	42	$42/490 \times 220 = 19$
B.Ed –French	12	16	28	$28/490 \times 220 = 12$
TOTAL	289	201	490	220

Simple stratified random sampling technique was then be used to select respondents from each cohort to take part in the research. Respondents were randomly determined and samples drawn until the desired sample size was attained since it was practically impossible to get all the respondents in a single assembly. The choice of the number of respondents in each cohort sample was based on gender hence by quota sampling, the higher the number in the cohort the higher the number selected relative to the cohort sample size.

3.6 Instrumentation

This study employed Student Questionnaire (Appendix A: Student’s Questionnaire), interview schedule (Appendix B) and document content analysis.

3.6.1 Student Questionnaire (Appendix A)

In this study, a Questionnaire: based on a five-level Likert scale (*Describe me completely = 1; Describe me fairly well = 2; Unsure =3,Doesn’t describe me very well = 4 and Doesn’t describe me at all=5*) was used to gather the qualitative data. The questionnaire was based on Gardner’s multiple intelligences and Holland’s personality types to place students in

Gardner's multiple intelligences and Holland's personality types. Since there are no locally developed intelligence and personality interest inventories, the researcher adapted and modified an already developed MIDAS and SDS scales from the Psychological Assessment Resources Inc.

The questionnaire consisted of two parts. Part one inquired on participant's gender and career choice. Part two, section A consisted of self-scoring statements that describe a respondent's type of intelligence. This sought to establish the type (s) of Intelligence (9 modes; 90 stems) based on Gardner's Multiple Intelligences. For example a mode would be: Logical-Mathematical intelligence and the stem is 'Maths and Science are my favorite subjects.' Section B consisted of self-scoring statements that describe a respondent's personality type. This sought to establish the Personality Type (s) (6 typologies; 60 stems) of the respondents based on Holland's Typologies. For example, a mode would be: social personality type and the stem is 'I am concerned with the welfare of others'. Section C sought to establish the Career Choice (5choice; 50 stems) of the respondent based on the selected public university B.Ed programmes. The statements were modified in terms of terminologies and phraseologies to make them suitable for use in this study only hence sensitive and applicable to the target sample of this study. The items were not serialized to minimize on response biasness and spontaneity. The questionnaires were also anonymous and confidential.

3.6.2 Interview Schedule (Appendix B)

An interview schedule was used in a face to face interaction to gather qualitative information from key informants regarding the types of intelligence, personality types and career choice. This was meant to add value to this study by corroborating and validating responses in the questionnaire. These types of questions that were preferred were those that allowed respondents to explain answers without limitation and to clarify what was important. The researcher also had an opportunity to clarify questions.

3.6.3 Document Content Analysis

The researcher also obtained vital researched and recorded information regarding student population, careers, and personality types, intelligence types from documented materials like journals, official websites, admission registers, sessional papers, education commission and working party reports and relevant course materials.

3.7 Reliability and Validity of Instruments

3.7.1 Reliability

For the purposes of attaining reliability and to remove language ambiguity the questionnaire was personally distributed among forty nine (10% of the study population) subjects as a pilot run. This pilot study was conducted during the first week of October 2022 before the administration of the final version of questionnaires. The pilot study was conducted among randomly selected 49 first-year undergraduate students in the B.Ed programmes in the university. Reliability was determined by test-retest method for internal consistency of the items. The instruments were administered twice at an interval of two weeks. Data was analyzed through SPSS–16. Pearson Product Moment correlation was used to determine reliability at alpha level 0.05. The resulting value obtained was a reliability index of 0.84. Test-retest reliabilities for most MIDAS across multiple samples range between 0.78 and 0.89 with a mean of 0.86 (Shearer, 2007) and within the range of 0.92 as posited by Holland, Fritzsche & Powell (1994) and 0.8 by Orodho (2009) for SDS (R). This means that the instruments were reliable enough to be used to answer the research questions in the actual study.

3.7.2 Validity

To ensure face and content validity of the questionnaires and interview schedule, the research instruments were screened for content and language appropriateness by three psychometric experts from the department of Educational Psychology, at the university and their input included in the final draft of the instruments.

The questionnaire was also adapted from online multiple intelligence tests and personality tests (www.multipleintelligencetests.com, 2012; Hollands.com, 2012). Adaptation was done to reflect the sociocultural realities in the Kenyan context. This was also done to validate the instrument's face, construct and content research thresholds.

3.8 Procedures for Data Collection

A research permit was obtained from the university's Ethics Review Committee (MUERC) to facilitate conducting of the study within the public university. Letters informing the Dean, School of Education of the intended research were dispatched through the Chairman of the Department of Educational Psychology. The researcher then visited the degree programme offices for introduction, to obtain permission and to familiarize himself with the administrators, lecturers and student class representatives for the purposes of making

arrangements for the administration of instruments. The researcher got introduced to various lecturers in-charge of varied course units after which he contacted them and made appointments with the lecturers to permit administration of the questionnaires during lecture sessions. Where this was not feasible, student class representatives assisted the researcher in administration of the questionnaires to their classmates at their convenient time.

Data was collected cross-sectionally from each cohort sample on a weekly timeframe in the first quarter of the second semester over a period of one month. This data was collected when the students were in session on main campus during lecture sessions and at any opportune time that the participants could be reached like during breaks in between the lectures. Students who were present took part voluntarily. Subjects who were not willing to complete the questionnaire were not compelled to do so. The questionnaires were administered during the two-hour common course lectures and at times when students were out of lecture halls mostly during their free time. Class representatives who acted as research assistants greatly helped with the latter as they were familiar with their classmates and their on-campus routine.

The researcher would explain the purpose of the study, confirm voluntary participation and assure all respondents of confidentiality. Thereafter, the questionnaires would be distributed to the respondents in the lecture hall. The students were given few minutes to fill (it took an average of 25-30 minutes to complete the questionnaire) and return the questionnaires. This ensured an immediate high rate of return and low cost factor. On-the-spot administration of questionnaire also ensured non-interference from other variables like response assistance and gave the researcher an opportunity to explain the study. Interview schedule was conducted at the time of administering the questionnaire through face to face interview with key respondents. The responses were recorded with informed consent from the respondents. This ensured accountability and legitimacy when communicating the findings of the study.

3.9 Methods of Data Analysis

The independent variables in this study were types of intelligence and personality types. The dependent variables were and career choice. The qualitative and quantitative data collected from the study was analyzed at two levels. The raw data generated using the questionnaire was coded and entered into a Statistical Package for Social Sciences (SPSS) Version 16 computer program. The data was analyzed according to the objectives posted for the study.

First, descriptive data from closed ended items in the questionnaire like gender, study category, career choice, type of intelligence and personality type, were subjected to computation of descriptive statistics such as frequency counts, percentages and central tendency measure of mode. The descriptive data was further reported using bar graphs. Similarly, types of intelligence across gender, personality types across gender, intelligence types across career choice and personality types across career choice were established using percentage gender distribution. The SPSS –Version 16 program was used for this analysis.

Types of intelligence were classified as mathematical/logical, linguistic/verbal, bodily/kinesthetic, visual/spatial, musical/rhythmic, interpersonal, intrapersonal, naturalist and existential and measured using questionnaire based on Gardner's Multiple Intelligence theory (1983). The types of intelligence were coded as 1-9. The ten statements under a type of intelligence were similarly coded with a corresponding value of 1-9. For example, Bodily-Kinesthetic intelligence was coded 1 and all statements describing this type of intelligence coded 1.

The researcher scored the questionnaire by counting (TICKS) and the totals recorded in the boxes shown on the questionnaire (*Describe me completely = 1; Describe me fairly well = 2; Unsure = 3, Doesn't describe me very well = 4 and Doesn't describe me at all = 5*). For each score, 1 was interpreted as most descriptive while 5 indicated most nondescriptive. All scores between (1-2) on the liker scale was considered as a respondent's dominant type of intelligence. The MIDAS Professional Manual (Shearer, 2007) was utilized to interpret the results and categorize each respondent into an intelligence type(s). The MIDAS ranking scale by Shearer (2007) scores range from 0 -100% (*80-100 = *Very High*: *60 -79% = *High*: 40 – 59% = *Moderate*: *20 -39 = *Low*: *0 – 19 = *very Low*).

Personality types were classified as realistic, investigative, artistic, social, enterprising, and conventional (RIASEC) and were measured using questionnaire based Holland's (1997) theory. The ten statements under a type of personality were similarly coded with a corresponding value of 1-6. For example, the Conventional personality type was coded 6 and all statements describing this personality type coded 6. All the scores/ticks for each column and level of response were added. The researcher scored questionnaire by counting (TICKS) and the totals recorded in the boxes shown on the questionnaire (*Describe me completely = 1; Describe me fairly well = 2; Unsure = 3, Doesn't describe me very well = 4 and Doesn't describe me at all = 5*).

For each score, 1 was interpreted as most descriptive while 5 indicated most nondescriptive. All scores between (1-2) on the likert scale were considered as a respondent's dominant personality type. For the purposes of this research, the highest of the six numbers for each participant was taken to be his/her personality type. The SDS-R Holland Typologies (1997) was utilized to interpret the results and categorize each respondent into a personality type(s). In this case, the highest scores R (6), I (5), A (4) S (3) E (2) C(1) indicated the summary code for the participant. The researcher used the 1st letter to determine the personality type of the participant. For example, a person was regarded as a realistic personality type since R had the highest frequency.

Career choice (Degree programs) is classified using the School of Education programmes guide (2012), which reflects the different B.Ed programmers (B.Ed- Arts, B.Ed- Science, B.Ed- Special Needs, B.Ed- ECDE and B.Ed- French) within the selected public university (Academic Division, 2012). The dependent variable was congruent with the degree program. Congruence was measured using a dichotomous dummy score of (1) Congruent and (2) Incongruent, was generated from the liker scale with scores ranging from 1-5. The liker scale had statements to assess the student familiarity with the degree program, which were scored at five levels namely: 1. (*Describe Career Choice completely*); 2. (*Describe Career Choice Fairly Well*); 3. (*Unsure*) 4. (*Doesn't describe career choice very well*); 5. (*Doesn't describe career choice at all*).

The ten statements under a type of career choice were coded with a corresponding value of 1-5. All the scores/ticks for each column and level of response were added and the highest scores indicated the respondent's familiarity with the career choice within the B.Ed programmes. For each score, 1 was interpreted as the most congruent while 5 indicated most incongruent. All scores between (1-2) on the liker scale were considered as congruent, while scores between 3-5 were considered incongruent with the degree program.

Lastly qualitative data obtained through the interview schedule was transcribed into text form of emerging themes and reported. Information that was similar in content was merged into single coherent description of discussion of themes per the objectives of the study. Equally information from document content analysis guides were synthesized to validated research findings. These analytical techniques reinforced each other and enabled the researcher to explain findings obtained from the questionnaire.

3.10 Logistical and Ethical considerations

3.10.1 Logistical Considerations

The researcher obtained the required licenses from MUSERC (Appendices C) and NACOSTI (Appendices D) to carry out the study at the University. Plans of contacting the Deans of various schools who assisted the researcher to contact individual lecturers to allow time for data collection were put in place. Research assistants helped the researcher to collect code and analyze the data.

3.10.2 Ethical Considerations

Data for this study was collected during regular lecture sessions, breaks and free time and students who were present took part voluntarily. The researcher first briefed the subjects on the purpose of the study, and assured all respondents of confidentiality. To ensure confidentiality was maintained, the researcher assured the participants that the data collected was purely for the purposes of research. Before interviews were conducted, each participant was requested to fill in a consent form to accept to be involved in the study and the students were free to withdraw from the study if they so wished. The students were free to withdraw from the study if they so wished. Subjects who were not willing to complete the questionnaire were not compelled to do so.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The chapter presents the results and discussions of the findings of the study. The chapter begins with descriptive statistics computed for the predictor variables. Results are presented in frequency distributions and graphs. This is followed by statistical analyses of the objectives and the findings are presented and discussed according to the objectives under the study.

4.2 Demographic Data

A total of 220 first-year students participated in the study. Therefore 220 questionnaires were distributed to the participants and completed. The return rate was 100% of all questionnaires presented.

4.2.1 Gender of Respondents

Among the first-year students at selected public university, male students were 59.5% and female students were 40.5%. The data is presented in Table 4.1.

Table 4.1: Gender of Respondents

	F	%
Male	131	59.5
Female	89	40.5
TOTAL	220	100

With a 19% gender difference, the results imply that the gender gap has been reduced considerably and more female students are accessing university education at the University. This finding is in agreement with a documentary analysis from the Academic division of the university which indicated that the female students constitute about 40.58% while males make 59.42% (Academic Division, 2017). This result indicates that the population of male students exceeds that of females among the first-year students in all the B.Ed. programmes.

4.2.2 Study Category

Students who participated in the study were admitted in the public university either through joint government placement or self-sponsorship. There are an increased number of students enrolling in Kenyan public universities through the government supported admission. The study therefore assumed that students were enrolled in available degree programmes at the university. There is no evidence to show that majority of students sampled may have enrolled

in programmes of their choice given that government allocates to universities based on available programmes and university capacity. This finding is in agreement with the findings of Gitonga (2012) who reported that students are allocated available programme which may not be of their interest or choice.

4.2.3 Career Choice, Gender Distribution and Congruence with the B.Ed Programmes

The participants were required to indicate their degree programme. Gender distribution in the B.Ed programmes was investigated and the findings in this study show that the enrolment patterns to B.Ed programmes namely Science, Arts, French, Special Needs Education and ECDE disciplines are influenced by gender. The career choice in the B.Ed programmes and gender distribution is presented in Table 4.2.

Table 4.2: Gender Distribution in B.Ed Programmes

B.Ed Degree Programme	Males		Females		Total
	f	%	f	%	Total
B.Ed – Arts	80	67.2	39	32.8	119
B.Ed – Science	33	56.9	25	43.1	58
B.Ed –ECDE	5	41.7	7	58.3	12
B.Ed –Special	9	47.4	10	52.6	19
B.Ed –French	4	33.3	8	66.7	12
TOTAL	131	100	89	100	220

The results in Table 5 indicate that students enrolled in the B.Ed-Arts, there were more males (n=80; 67.2%) compared to females (n=39; 32.8%). In B. Ed-science were more males (n=33; 56.9%) compared to the females (n=25; 43.1%). The results revealed that more female (n=8; 66.7%) student enrolment in B. Ed- French, B.Ed-Special Education (n=10; 52.6%) and Early Childhood Studies (n=7; 58.3%). Overallly, males were the majority (59.5%) of total student enrolments in the first year B.Ed programmes. It is notable that in other academic programmes like B. Ed-French, the difference in enrollment of male and female students was not very large as depicted in Figure 4.1.

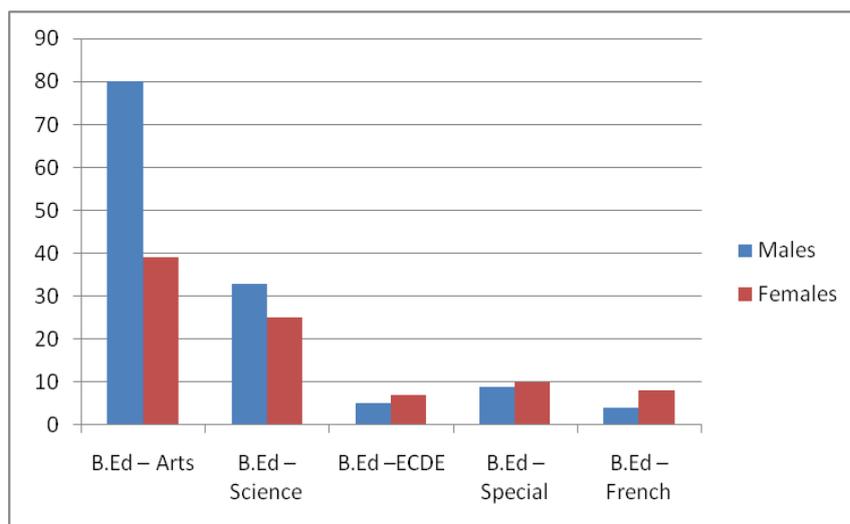


Figure 4.1: Gender Distribution in B. Ed Programmes

This finding is supported by Abdullah et al. (2009), Smart et al. (2006) and Ranson, (2003) who found that scientific fields attract more males than females. These results imply that gender continues to play a key role in the choice of mathematics and science based subjects with majority of females avoiding these fields. Gender therefore remains fundamentally correlated to vocational choice (Almiskry et al., 2009; Pike, 2006). The disparities in enrolment of females in science related fields continue to be supported in earlier studies by Gitonga (2012); Karugu and Otiende, (2012) and Eurostat, (2004) who state that the choice of careers and academic fields continue to reflect the gender dichotomy between males and females.

Sophie et al. (2006) investigated whether the sex differences observed on the subtests of intelligence tests were attributable to sex differences in general intelligence. The results of Sophie et al (2006) and Abdullah et al. (2009) study showed that males outperformed females on three out of ten subtests (information, arithmetic and matrix reasoning) while females performance was better than males only on one subtest namely digit of symbol substitution. This finding corresponds to the findings by Gitonga (2012) which showed that over 50% of female students enrolled in Special Education (68.8%) and Early Childhood Studies (61.1%). On the overall, females had over 50% enrolment in social sciences and languages.

Gitonga (2012), and Karugu and Otiende, (2012) pointed out that the Faculty of Education has traditionally received more females compared to other Faculties like Science. Most of the female students felt as if they were weak in mathematics and sciences as was reported by Betz (2008). The disparities in enrolment of females in science related fields continue to be

supported in earlier studies by Sophie et al. (2006), Abdullah et al. (2009) and Gitonga (2012) who state that the choice of careers and academic fields continue to reflect the gender dichotomy between males and females. The results are supported by the findings of Holland and Gottfredson (1997), Smart et al (2006) who reported more males in science fields and more females in social sciences. The results are consistent with International data in EUROSTAT (2004) which shows that in Europe and other industrialized countries, the number of women in science fields has been increasing steadily but still falls far below the males (Ranson, 2003; Bix, 2004 & Gitonga, 2012).

However, the researcher interview with a number of respondents from different programmes courses and results revealed that the minor gender disparities were characterized by the nature of subjects offered, with more male students dominating science subjects while females languages. Most female respondents claimed to have been misplaced in the B.Ed choice Gender therefore continues to play a key role in the choice of subjects however a significant number of female students prefer and embraced enrollment in science related fields.

The researcher also examined the relationship between congruence as a measure of fit and the choice of B.Ed. degree program. Congruence in this study was examined as a measure of familiarity expressed by respondents regarding their choice of B.Ed programmes. Familiarity with the career choice they were pursuing was examined using a questionnaire on career choice and how much they felt the statements described their career choice were established on a likert scale 1-5. The results of the distribution of congruence in B.Ed programmes are shown on Table 4.3.

Table 4.3: Congruence with Career Choice in the B.Ed Programmes

B.Ed Programme	Congruent		Incongruent		Total	
	f	%	f	%	f	%
B.Ed-Arts	82	68.9	37	31.1	119	100
B.Ed- Science	43	74.1	15	25.9	58	100
B.Ed-Special Needs	15	78.9	4	21.1	19	100
B.Ed-French	9	75	3	25	12	100
B.Ed-ECDE	9	75	3	25	12	100

An examination of the data in Table 6 shows that programmes which registered the highest number of respondents who were familiar with their career choice were B.Ed-ECDE (n=9;75%), B.Ed-French (n=9;75%), B.Ed-SNE (n=15;78.9%) and B.Ed-Science (n=43;74.1%) while B.Ed-Arts registered the least (n=82; 68.9%) cases of congruence. In

sum, majority (n=158; 71.82%; 258.5⁰) of students were familiar with the degree programmes they were pursuing. These results are in harmony with the findings of Gitonga (2012) who found that majority (86.3%) students in the school of Education at Kenyatta University are familiar with their career choice. Feldman, Smart and Ethington (2006) however argue that a student who is not congruent can through socialization, learn from the interactions with the faculty and develop skills, attitudes and values that would in turn help them fit in the academic environment.

A spontaneous interview with the B.Ed-French, B.Ed-ECDE and B.Ed-SNE respondents revealed that majority of the students enrolled in these programmes had a well formulated expected learning or course outcomes and programme outline. In addition, a number of them especially in the latter two (B.Ed-ECDE and B.Ed-SNE) had already undergone similar buildup courses at certificate or diploma levels and were therefore familiar with the choice even by virtue of its professional content, title, and salient characteristic not shared in B.Ed-Arts and B.Ed-Science courses.

These results imply that students are familiar with their career choice hence need to be in academic environments of choice. They seek to be enrolled in degree programmes where their interests will be fulfilled as they develop competencies. This result is corroborated in the current study where having spent considerable time at the university, first year students were familiarized and socialized through orientation programmes offered by the different schools, departments and cohorts. This was done with the intention of assisting those who are not congruent to achieve some level of congruence by developing skills, attitudes and values that can help them fit in the academic environments they find themselves in.

4.3 Types of Intelligence among First-Year Undergraduate Students

In response to the first objective which was to establish types of intelligence among first-year undergraduate students in the Bachelor of Education degree programmes in the selected public university, student's percentages were calculated. The results showed all participants possess all the types all intelligences in varying levels. For instance, majority of students (n=34; 15.5%) reported high frequency in interpersonal intelligence which ranked first. This was followed by verbal-linguistic intelligence (n=32; 14.5%), logical-mathematical intelligence (n=30; 13.6%), bodily-kinesthetic (n= 28; 12.7%), and naturalistic intelligence (n=28; 12.7%). However low frequencies were recorded in visual-spatial intelligence (n=16; 7.3%), intrapersonal intelligence (n=16; 7.3%) and existentialist intelligence (n=16; 7.3%).

Because of percentages recorded on these multiple intelligences, they were considerably regarded less common. The types of intelligences (frequency counts, percentages and rank) among first year undergraduate B.Ed students shown in Table 4.4.

Table 4.4: Types of Intelligence among First –Year Undergraduate Students

Type of intelligence	f	%	Rank
Interpersonal	34	15.5	1
Verbal –Linguistics	32	14.5	2
Logical-Mathematical	30	13.6	3
Bodily-Kinesthetic	28	12.7	4
Naturalistic	28	12.7	4
Music-Rhythmic	20	9.1	6
Existentialist	16	7.3	7
Intrapersonal	16	7.3	7
Visual-Spatial	16	7.3	7
TOTAL	220	100	

From Table 4.4, the most dominant type of intelligence was interpersonal intelligence followed by verbal-linguistics and then logical-mathematical, in that order. The least dominant were existentialist (7.3%), intrapersonal (7.3%) and visual-spatial (7.3%). This result differs from that of Mustafa et al., (2014) who investigated types of multiple intelligence among undergraduate students at Yarmouk University and found that linguistic intelligence ranked first. The findings of this study concur with those of Yamin (2013) Hanafiye (2013). Whereas Yamin (2013) reported that respondents possessed all the nine types of intelligences in varying levels, Hanafiye (2013) revealed dominant types of intelligence like interpersonal and less common intelligences type like musical intelligence.

However, Mustafa et al., (2014), Mahasneh (2013), Al-Sabbah (2011), Al-Alwan (2008), Nofal and Al-Heeleh (2008), Gogebanakan (2003), and Net et al., (2008) postulate that a person may have all the multiple intelligences or some of them with varying degrees. The interpersonal intelligence which ranked first can be attributed to the nature of students at the university level, where they enjoy higher levels of social freedom and stability. Such a conducive academic environment gives them opportunities to identify their types of intelligence.

4.4 Types of Intelligence across Gender among First-Year Undergraduate Students

In response to the second objective which sought to establish the types of intelligence across gender among first-year undergraduate students in the Bachelor of Education degree programmes, frequency counts and percentages on the nine intelligence abilities were calculated as shown in Table 4.5.

Table 4.5: Types of Intelligence among Male and Female students

	Types of Intelligence																			
	IT		VL		LM		BK		N		MR		EX		IP		VS		Total	
	f	(%)	F	(%)	F	(%)	F	(%)	F	(%)	F	(%)	F	(%)	f	(%)	f	%	f	%
Male	18	(30.2)	19	(31.9)	18	(30.2)	16	(26.9)	18	(30.2)	12	(20.2)	10	(16.8)	10	(16.8)	10	(16.8)	131	100
Female	16	(39.6)	13	(32.1)	12	(29.7)	12	(29.7)	10	(24.7)	8	(19.8)	6	(14.8)	6	(14.8)	6	(14.8)	89	100
Total	34	(15.5)	32	(14.6)	30	(13.6)	28	(12.7)	28	(12.7)	20	(9.1)	16	(7.3)	16	(7.3)	16	(7.3)	220	100

KEY:

IT=Interpersonal; **VL**=Visual-Spatial; **LM**=Logical-Mathematical; **BK**=Bodily-Kinesthetic; **NT**=Naturalistic; **MR**=Music-Rhythmic; **IP**=Interpersonal and **VS**-Visual-Spatial.

Males dominated in all types of intelligence except interpersonal, verbal-linguistic and bodily-kinesthetic. Males recorded higher frequencies in logical-mathematical intelligence (f = 18; 30.2%) while females (f=12; 29.7%). In naturalistic intelligence, males were dominant (f =18; 30.2%) against females (f=10; 24.7%). However, both male and female respondents recorded equal frequencies in visual/spatial intelligence, existentialist intelligence and intrapersonal intelligence.

These results confirm the findings other studies such as Afanah and Al-Khazendar (2003); Gogebanakan (2003); Net, Ruiz, and Turnham (2008); Al-Alwan (2008), Nofaland Al-Heeleh (2008) while these results disagree with other studies such as Golam (2011), Khataybeh and Al-Bdor (2006) and Nofal and Al-Heeleh, (2008). The difference in types of intelligence across gender may be due to small sample sizes in some of the B.Ed programmes e.g. B.Ed-French and B.Ed-ECDE.

4.5 Personality Types across Gender among First-Year Undergraduate Students

To establish the personality types among male and female first-year students, data were grouped and analyzed according to the six Holland (1997) personality types (RIASEC). The personality types, frequency counts and percentages, are presented in Table 4.6.

Table 4.6: Personality Types among male and female B.Ed Students

Gender	Personality Types													
	RE		IN		AR		SO		EN		CO		TOTAL	
	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)
Male	19	(31.9)	21	(35.3)	21	(35.3)	24	(40.3)	23	(38.6)	24	(40.3)	131	(100)
Female	11	(27.2)	15	(37.1)	15	(37.1)	16	(39.6)	15	(37.1)	16	(39.6)	89	(100)
Total	30	(13.6)	36	(16.4)	36	(16.4)	40	(18.2)	38	(17.3)	40	(18.2)	220	(100)

KEY:

RE-Realistic; **IN**- Investigative; **AR**-Artistic; **SO**-Social; **EN**- Entrepreneurship; **CO**-Conventional

The personality type regardless of gender with the highest number of respondents was social and conventional (f=40; 18.2%). The personality type with the least number of respondents was realistic (f=30; 13.6%). Males recorded higher proportions in all personality types except in Artistic type where females were dominant (f =15; 37.1%). There were more males (f=21; 12.5%) in the Investigative personality type than females (f=15; 6.1%). These results are

consistent with the findings of some studies such as Chemeli (2013); Gitonga (2012), Abdullah et al., (2009), Migunde (2011) and Eurostat (2004).

Key informants attributed the high preference of social type and conventional type to lifestyle within the college and socialization. This is a reflection of students' interests in multiple areas and to pursue activities in suitable social environments with a less restricted degree of freedom. The existence of majority of students in the Investigative personality type may be due to the structured nature of their training where lecturers giving examples followed by exercises for practice in mathematics, or demonstration of experiments by the teacher in the chemistry laboratory, followed by group work assignments and term papers and research. Another reason given by respondents for embracing the enterprising personality type may be attributed to the way society views enterprising careers as glamorous and associated with wealth generation success and flamboyancy.

4.6 Types of Intelligence across Career Choice among First-Year Undergraduate Students

The fourth objective of the study was to establish types of intelligence across career choice in the Bachelor of Education degree programmes. First, the researcher examined the distribution of types of intelligence within the B.Ed programmes. The results of the study showing distribution of types of intelligence within the B.Ed programmes is presented in Table 4.7.

Table 4.7: Distribution of Types of Intelligence across Career Choice

Types of Intelligence	B.Ed Arts		B.Ed Science		B.Ed SNE		B.Ed French		B.Ed ECDE		TOTAL	
	f	(%)	f	%	f	(%)	f	(%)	f	(%)	f	%
Interpersonal	18	(15.1)	6	(10.3)	5	(26.3)	2	(16.7)	3	(25.0)	34	(15.5)
Verbal – Linguistics	16	(13.4)	7	(12.1)	2	(10.5)	5	(41.7)	2	(16.7)	32	(14.5)
Logical-Mathematical	10	(8.4)	15	(25.9)	2	(10.5)	1	(8.3)	2	(16.7)	30	(13.6)
Bodily – Kinesthetic	15	(12.6)	10	(17.2)	1	(5.3)	1	(8.3)	1	(8.3)	28	(12.7)
Naturalistic	12	(10.1)	15	(25.9)	1	(5.3)	0	(0.0)	(0.0)	(0.0)	28	(12.7)
Music-Rhythmic	13	(10.9)	1	(1.7)	3	(15.8)	1	(8.3)	2	(16.7)	20	(9.1)
Existentialist	13	(10.9)	1	(1.7)	2	(10.5)	0	(0.0)	(0.0)	-	16	(7.3)
Intrapersonal	12	(10.1)	1	(1.7)	1	(5.3)	2	(16.7)	(0.0)	-	16	(7.3)
Visual-Spatial	10	(8.4)	2	(3.4)	2	(10.5)	0	0	2	(16.7)	16	(7.3)
TOTAL	119	(100)	58	(100)	19	(100)	12	(100)	12	(100)	220	(100)

From Table 4.7, the most dominant types of intelligence across B.Ed programmes were interpersonal intelligence (f=34; 15.5%) followed by verbal-linguistic (f =32; 14.5%) followed by logical-mathematical (f=30; 13.6%). The least dominant were existentialist, intrapersonal and visual-spatial (f=16; 7.3%). All the types of intelligence were distributed across all the B.Ed programmes with the exception of naturalistic and existentialist. More specifically, the B.Ed French and B.Ed-ECDE programmes had no naturalistic and existentialist types of intelligence. Similarly, visual-spatial type of intelligence was not found in B.Ed French while intrapersonal was not found in B.Ed –ECDE programme.

The most dominant type of intelligence in the B.Ed (Arts) programme was interpersonal intelligence (f=18; 15.1%). This was followed by verbal linguistics (f=16: 13.4%). The least type of intelligence among B.Ed (Arts) respondents were existentialist and visual-spatial (f=10; 8.4%).

According to MIDAS Manual (2007), the other intelligence types like bodily – kinesthetic (f= 15; 12.6%), musical-rhythmic (f=13; 10.9%) and existentialist (f=13;10.9%) are considered moderate in terms of proportions in populations. However, the current study found them to be less dominant types of intelligence.

In B.Ed (Science), the least type of intelligence was the music/rhythmic, existentialist and intrapersonal (f=1; 1.7%) while logical-mathematical and naturalistic intelligence recorded

the highest number of respondents (f=15; 25.9%). Results also show that in B. Ed (SNE), the dominant types of intelligence was interpersonal (f=5; 26.3%) followed by music-rhythmic (n=3; 15.8%). However, intrapersonal, bodily and naturalistic intelligence recorded the least number of respondents (f=1; 5.3%) within the B. Ed-SNE.

Within the B. Ed French programme, the dominant type of intelligence was verbal-linguistic (f=5; 41.7%). However, naturalistic and visual spatial types of intelligence were not found in the programme. Results further showed that B. Ed -ECDE had few cases across all types of intelligence.

These results are in agreement with the results of Mustafa et al. (2014) who reported differences between the types of intelligence in favour of science colleges and those in favour of humanities. However, Matto et al. (2006) found that interpersonal intelligence (79.4%) was more common in Virginia University than other types of intelligence. Findings of the current study however, differ from those of Matto et al. (2006) in which intrapersonal intelligence ranked highly (64.0%), while logical mathematic (8.0%) and spatial (7.8%) types of intelligence faculty members ranked low.

The themes that emerged from key informants attributed their dominant types of intelligence such as logical-mathematical was linked science based programmes. These programmes largely focused on scientific concepts, methodologies, activities and skills through the use of a wide range of tools based on scientific evidence and experiments. As per B.Ed-French and B. Ed-Arts sharing similar dominant types in verbal- linguistic, music-rhythmic and interpersonal intelligences. Respondents from these programmes alluded to the two programmes sharing similar common units especially in the linguistics department and humanities which focus on the methodologies, activities, and skills that develop the linguistic, interpersonal, and musical intelligences through concentrating on certain strategies such as discussion, dialogue, verbal and written expressions and debate.

However, the themes emerging from each programme and should not be misinterpreted by the reader since this study was done with large groups especially in the B. Ed Arts and B. Ed-Science and this may have obscured important individual and subgroup differences for groups with low enrolments like B. Ed-French and B. Ed-ECDE. The results were further attributed the distribution of types of intelligences across the B. Ed programmes to the

predetermined criteria of subject mean scores, combinations, and expected course outcomes specific to each degree programme.

4.7 Personality Types across Career choice among First-Year Undergraduate Students

In this objective, the researcher's intention was to establish the personality types across career choice in the Bachelor of Education degree programmes. The researcher examined the distribution of personality types across career choice. The results of the study showing distribution of personality types within the B.Ed programmes as presented in Table 4.8.

Table 4.8: Distribution of Personality Types across Career choice

B.Ed programmes	Personality Types													
	RE		IN		AR		S O		EN		CO		TOTAL	
	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)	f	(%)
B.Ed- Arts	12	(40.0)	15	(41.7)	24	(66.7)	36	(90.0)	12	(31.6)	20	(50.0)	119	(100)
B.Ed -Science	10	(33.3)	18	(50.0)	6	(16.7)	1	(2.5)	15	(39.5)	8	(20.0)	58	(100)
B.Ed-SNE	5	(16.7)	2	(5.6)	1	(2.8)	1	(2.5)	3	(7.9)	7	(17.5)	19	(100)
B.Ed –French	1	(3.3)	0	(0.0)	2	(5.6)	1	(10.0)	2	(5.3)	6	(15.0)	12	(100)
B.Ed-ECDE	2	(6.7)	1	(2.8)	3	13.9	1	5.0	2	(5.3)	3	(7.5)	12	(100)
TOTAL	30	(13.6)	36	(16.4)	36	(16.4)	40	(18.2)	38	(17.3)	40	(18.2)	220	(100)

KEY:

RE-Realistic; **IN**- Investigative; **AR**-Artistic; **SO**-Social; **EN**- Entrepreneurship; **CO**-Conventional

Holland personality types were recorded across all B.Ed programmes except B.Ed- French which had no respondents in investigative (f=0; 0%). The B.Ed programme is dominated by social personality type (f=40; 18.2%) with B.Ed-Arts, recording the highest number of respondents in social type (f=36; 90.0%). B.Ed-Science was dominated by investigative type (f=18; 50.0%). The B.Ed-SNE is dominated by all RIASEC codes with the highest number of respondents exhibiting conventional personality type (f=7; 17.5%), followed by realistic type (f=5; 16.7%). All the personality types were well distributed among the sample of twelve B.Ed ECDE students. The dominant personality type in B.Ed-French was by convectional type (n=6; 15.0 %). However, B.Ed-French also recorded the lowest number of respondents in Realistic (n=1; 3.3%) and no respondent in Investigative types (n=0; 0%).

Several studies have supported this finding revealing that students will seek academic environments that match their personality types and avoid those which do not match their interests (Smart, Feldman & Ethington, 2006; Porter & Umbach, 2006). For example,

Ktoridou et al (2014) reported over 50% of the students personality types were found in a corresponding academic environment with the social type represented the largest group (61.9%). A study by Fred (2012) also showed that 70% of the population had personality types congruent with their career choice. Ktoridou et al. (2014) reported that School of Science dominated by Investigative type (63%), School of Education dominated by Social type (61.9%). Similarly Gitonga (2012) reported that the School of Education was dominated by social type (61.9%) while science disciplines were dominated by investigative type (63%). Tasrif (2022) also found the dominant personality type in each study program tested is Informatics Engineering dominated by social personality type (71%), and Remote Sensing Technology had a social dominant personality type (74%).

The themes that emerged from key informants in different B.Ed programmes revealed personality types that trained them to develop skills and attitudes associated with the degree choice through preferred activities and encourage members to behave in ways consistent with the preferred style of the academic environment e.g. science students putting on white lab coats across lecture halls. Most respondents in the B.Ed -Arts especially music students felt that they had a chance to develop their musical talents and skills. The respondents in B. Ed-Science retorted that the courses they were pursuing fitted well with their interests and gave them opportunities to explore scientific concepts e.g. students taking mathematics or physicists hence dominance in investigative type. From the information, the career path the students wanted to pursue seemed clear in their minds and the need to develop the competences in those areas of occupational interest was critical. However any mismatch was attributed to the assumption that some of these students may be studying some courses because that's what was available, availability of job opportunities, parental pressure or what society considers glamorous but not because of a personality interests.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusions and recommendations of the study.

5.2 Summary of Findings

The study findings were summarized as follows:

5.2.1 Demographic Data and Career choice

The study respondents comprised 59.5% male and 40.5% female students. The findings showed in the B. Ed-Arts, there were more males (n=80; 67.2%) compared to females (n=39; 32.8%). Male students continue to dominate the B.Ed science (n=33; 56.9%) while female students dominate B.Ed-French (66.7%). The study however revealed more female (n=8; 66.7%) student enrolment in B. Ed- French, B.Ed- Special Education (n=10; 52.6%) and Early Childhood Studies (n=7; 58.3%). Overallly, males were the majority (59.5%) of total student enrolments in the first year B. Ed programmes. In other academic disciplines like B. Ed-French, the differences in enrollment of males and females were not very large.

5.2.2 Types of Intelligence among First-Year Undergraduate Students

The results showed that first-year students' dominant types were interpersonal (15.5%), verbal-linguistic (14.5%), logical-mathematical (13.6%), bodily-kinesthetic (12.7%), and naturalistic (12.7%) intelligences. The students had equally less dominant types of intelligences such as visual-spatial (7.3%), intrapersonal (7.3%) and existentialist (7.3%) however these scores were deemed low in comparison to the intelligences previously mentioned hence regarded as less common intelligences.

5.2.3 Types of Intelligence across Gender among First-Year Undergraduate Students

Males dominated in all types of intelligence except interpersonal, verbal-linguistic and bodily-kinesthetic. Furthermore, male respondents recorded higher frequencies in logical-mathematical intelligence while females. In naturalistic intelligence, males were dominant against females. However, both male and female respondents recorded equal frequencies in visual-spatial intelligence, existentialist intelligence and intrapersonal intelligence.

5.2.4 Personality Types across Gender among First-Year Undergraduate Students

The personality type with the highest number of respondents was social (f=40; 18.2%) followed by conventional (f=40; 18.2%). The personality type with the least number of respondents was realistic (f=30; 13.6%). Males recorded higher frequencies in all personality types except in Artistic type where females were dominant (f =15; 37.1%). Investigative type was chosen by majority males (f=21;12.5%) and least chosen by females (f=15; 6.1%); The research showed that the social and conventional type was the mostly (f=40; 18.2 %) preferred type by both males and females.

5.2.5 Types of Intelligence across Career choice among First-Year Undergraduate Students

All the types of intelligence were distributed across all the B.Ed programmes with the exception of naturalistic and existentialist intelligence. The most dominant types of intelligence across B.Ed programmes were interpersonal intelligence (f=34; 15.5%), verbal-linguistic (f =32; 14.5%) and followed by logical-mathematical (f=30; 13.6%). The least dominant were existentialist, intrapersonal and visual-spatial intelligence (f=16; 7.3%).

The most dominant type of intelligence in the B.Ed (Arts) programme was interpersonal intelligence (f=18; 15.1%). This was followed by verbal linguistics (f=16: 13.4%). The least type of intelligence among B.Ed (Arts) respondents were existentialist and visual-spatial (f=10; 8.4%). More specifically, the B.Ed French and B.Ed-ECDE programmes had no naturalistic and existentialist types of intelligence. Similarly, visual-spatial type of intelligence was not found in B.Ed -French while intrapersonal was not found in B.Ed – ECDE programme.

In B.Ed (Science), the least type of intelligence were the music/rhythmic, existentialist and intrapersonal (f=1; 1.7%) while logical-mathematical and naturalistic intelligence recorded the highest number of respondents (f=15; 25.9%). Results also show that in B. Ed (SNE), the dominant types of intelligence were interpersonal (f=5; 26.3%) followed by music-rhythmic (n=3; 15.8%). However, intrapersonal, bodily and naturalistic intelligence were least dominant (f=1; 5.3%) within the B. Ed-SNE. Within the B. Ed French programme, the dominant type of intelligence was verbal-linguistic (f=5; 41.7%). However, naturalistic and visual spatial types of intelligence were not found in the programme. Results further showed that B. Ed -ECDE had few respondents across all types of intelligence.

5.2.6 Personality Types across Career Choice among First-Year Undergraduate Students

Holland personality types were recorded across all B.Ed programmes except B.Ed-French programme where no investigative type (f=0; 0%) was found. The B.Ed programme was dominated by social personality type (f=40; 18.2%) with B.Ed-Arts recording the highest number of respondents in social type (f=36; 90.0%). B.Ed-Science was dominated by investigative type (f=18; 50.0%). The B.Ed-SNE is dominated by all RIASEC codes with the highest number of respondents exhibiting conventional personality type (f=7; 17.5%), followed by realistic type (f=5; 16.7%). All the personality types were well distributed among the sample of twelve B.Ed ECDE students. In B.Ed-French conventional personality type (n=6; 15.0 %) was the most dominant type.

5.3 Conclusions

Based on the findings of the study, the following conclusions were made.

5.3.1 Demographic data and Career choice

The study concludes that gender remains an important factor in the choice of different B.Ed programmes. Majority of the students were familiar with their choice of B.Ed programmes.

5.3.2 Types of Intelligence among First-Year Undergraduate Students

The study concluded that first-year students at the selected public university possess nine Gardner's intelligence types in varying degrees and levels. The dominant types were reported in interpersonal, verbal-linguistic, logical-mathematical, bodily-kinesthetic and naturalistic intelligences. The least dominant types of multiple intelligence were visual-spatial, intrapersonal and existentialist intelligences.

5.3.3 Types of Intelligence across Gender among First-Year Undergraduate Students

Male and female students possess different types of intelligence with some favouring males and others favouring males. Males dominated in all types of intelligence except in interpersonal, verbal-linguistic and bodily-kinesthetic. However, both male and female respondents recorded equal frequencies in visual/spatial intelligence, existentialist intelligence and intrapersonal intelligence. The university B.Ed academic environment therefore provides for development of their dominant types of intelligence.

5.3.4 Personality Types across Gender among First-Year Undergraduate Students

The personality type regardless of gender with the highest number of respondents was social and conventional. The personality type with the least number of respondents was realistic. Males recorded higher proportions in all personality types except in Artistic type where females were dominant. There were more males in the Investigative personality type than females. The study concluded that male and female students possess different personality types within the university B.Ed programmes which provides for development of student dominant personality types.

5.3.5 Types of Intelligence across Career Choice among First-Year Undergraduate Students

The most dominant types of intelligence across B.Ed programmes were interpersonal intelligence followed by verbal-linguistic and then logical-mathematical in that order. The least dominant were existentialist, intrapersonal and visual-spatial. All the types of intelligence were distributed across all the B.Ed programmes with the exception of naturalistic and existentialist. More specifically, the B.Ed French and B.Ed-ECDE programmes had no naturalistic and existentialist types of intelligence. Similarly, visual-spatial type of intelligence was not found in B.Ed French while intrapersonal was not found in B.Ed –ECDE programme. The study concluded that the types of intelligence is reflected in the B.Ed programmes to nurture of unique abilities of students through strategies, activities, courses and development of competencies core to each specific programme.

5.3.6 Personality Types across Career Choice among First-Year Undergraduate Students

Holland personality types were recorded across all B.Ed programmes except B.Ed- French which had no respondents in investigative. The B.Ed programme was dominated by social personality type with B.Ed-Arts, recording the highest number of respondents in social personality type. B.Ed-Science was dominated by investigative personality type. The B.Ed-SNE was dominated by all RIASEC codes with the highest number of respondents exhibiting conventional personality type followed by realistic type. All the personality types were well distributed among the sample of twelve B.Ed ECDE students. The dominant personality type in B.Ed-French was by conventional type. However, B.Ed-French also recorded the lowest number of respondents in Realistic and no respondents in Investigative types. The study

concluded that B.Ed first year undergraduate students are enrolled in programmes which are an expression of their vocational typologies.

5.4 Recommendations

This following practical implications or recommendations, which are based on the objectives of the study, can be adopted by educators, counselors, career development professionals, policy makers and researchers;

- i. A career guidance programme at the universities will enhance a student's ability to make the relation between intelligence, personality types and career choice. This is because university academic departments do more teaching than career guidance.
- ii. Universities can also help students become more aware the academic environments but also to offer various activities, so students realize whether the degree programme are congruent with their multiple intelligence and personality types.
- iii. The School of Education at the university is encouraged to design its courses and teaching methodologies in accordance with the dominant multiple intelligences and personality types among their students. The university should give more attention to the visual-spatial, existentialist intelligence and artistic personality types.
- iv. Additionally, career interests begin with early access to activities and programs. Some of the participants in this study e.g. B.Ed-SNE and B.Ed-ECDE had previous participation with education programmes at certificate and diploma levels hence directing state and local resources to support career education may promote earlier exposure to interest and skill development.
- v. The university placement process should appraise students to ensure they are placed in degree choice where their intelligences and personality types will be nurtured.
- vi. The Ministry of Education in Kenya should examine the implication of Holland's (1997) and Gardner's (1983) career models on career guidance to inform career guidance practices at pre-university level. The assumption is that students joining university have already chosen careers. Opportunities for B.Ed students to take the MIDAS and SDS should be considered. This will improve self-awareness of students and assist educators or counselors to decide the way of intervention (e.g., individual counseling, group counseling, self-help, lecture, etc.) based on the students' patterns.

5.4.1 Recommendations for Further Research

- i. There is need to conduct study to test the predictive powers of these intelligence and personality types with respect to learning styles and scholastic academic achievements. It goes without saying that among B.Ed-science students, the best predictor is postulated to be logical-mathematical intelligence and investigative personality types.
- ii. The study recommends the need to investigate factors at the university environment which influence the development of female and male intelligences and personality types.
- iii. A longitudinal study based on the premise of this current study would be conducted involving following up the students in their career training, tracking their progress leading to their graduation.
- iv. A large-scale comparative study with a larger sample size could ventilate more on how Gardner's MI and Holland codes influence the suitability of students in a other degree programmes not only in within the public university but also in private universities in Kenya,.
- v. Research on the current practices of teacher education institutions with respect to multiple intelligences and personality types can be conducted.

5.4.2 Contribution to Knowledge

- i. The government and relevant stakeholders should devise comprehensive appraisal tools that encourage holistic assessment of students to inform placement of students into degree programmes which suit the interests and unique abilities.
- ii. The findings and recommendations of this study would boost career guidance knowledge and practice and provide readily available complementary information to career counseling services, training and research knowledge.
- iii. Findings and recommendations of this study based on Gardner's MI and Holland vocational personality types would be useful to university academic advisors to understand the abilities and interests of their students in choosing course major, retention efforts and success in training.
- iv. Finally, this study may provide useful guidelines to government and stakeholders to synchronize vocational intelligence personality traits into the operationalization of competency based curriculum key pathways.

REFERENCES

- Abdulla, S. A., Bakar, R. & Othman, M. (2009). Gender difference and career interest of undergraduates: Implications for career choice. *European Journal of Scientific Research*, 26(3), 465-469.
- Academic Division, (2017). Selected university academic programmes. Retrieved from <http://www.masenouniversity.ac.ke> on 27/10/2017.
- Access, Open & Terence, J. G. T. (2021). Validity and reliability findings of personal globe inventory short form *Turkish*. 4: 24–48.
- Acosta, M. (2012). Multiple intelligence action research. Retrieved from <http://www.theWritingtutor.biz/articles/MI-intro-roblem.php> on 25/1/2012.
- Adrian, F., & Buchanan, T. (2005). Personality, gender and self-perceived intelligence. *Journal of Personality Individual Difference*, 39, 543-555.
- Advance CTE. (2020). Career clusters. <https://careertech.org/career-clusters>
- Afanah, I., & Al-Khazendar, N. (2003). Levels of multiple intelligences among basic cycle Students in Gaza and its relationship with achievement in mathematics and tendency towards it. *Journal of Humanity Research*, Islamic University in Gaza, 12(2), 323-363.
- Ahmad, M. A. (2010). *The impact of a program based on multiple intelligences in developing creative thinking and achievement among students of the commercial secondary school*. [Unpublished master's thesis]. University of Cairo.
- Ahmed, S., Ahmed, A., and Salahuddin, T. (2019). How RIASEC personality traits crystallize occupational preferences among adolescents: Match or mismatch. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, 13(4), pp. 976-996
- Al-Alwan, A. F. (2008). Identifying the intelligence preferences among 4th and 8th graders in accordance with multiple intelligence theory. *Dirasat Journal, University of Jordan, Educational Sciences*, 37(2), 454-474.
- Alghazo, K., Obeidat, H., Al-Trawneh, M., & Alshraideh., M. (2009). Types of multiple intelligences in social studies' Arabic and English language textbooks for first three grades. *European Journal of Social Sciences* 12(1), 232 -258.
- Allen, J., & Robbins, S. (2010). Effects of interest-major congruence, motivation, and academic performance on timely degree attainment. *Journal of Counseling Psychology*, 57, 23-35.

- Almiskry, A. S. (2009). Gender difference and career interest among undergraduates: Implications for career choice. *European Journal of Scientific Researchers*, 26(3), 465-469.
- Al-Sabbah, S., Al-Sabbah, S., & Abod, F. (2011). The implications of MI theory and MIDAS scale for educators and students in Jordanian schools. *International Journal of Innovation, Management and Technology*, 2(2), 324 -347.
- Armstrong, P. I., Day, S. X., Mcvay, J. P., & Rounds, J. (2008). Holland's RIASEC model as an integrative framework for individual differences. *Journal of Counseling Psychology*, 55, 1–18
- Armstrong, T. (2009). *Multiple intelligences in the classroom* (3rd Ed.). Virginia: Wiley
- Armstrong, T. (2010). *Multiple intelligences inventory for adults*. Retrieved 15th February, 2010 from: <http://www.Avln.Org/Resources/Standards/Pdfs/Imi>
- Armstrong, T. (2012). *What are the types of multiple intelligence?* Retrieved from <http://www.Idpride.net/learningstyles.MI.html> on 25/10/2012.
- Armstrong, T. (2017). *Multiple Intelligences in the classroom* (4th Ed.). Alexandria, VA: Association for Supervision & Curriculum Development.
- Betz, N.E. (2008). Advances in vocational theories. In S. D. Brown & R. W. Lent (Eds.), *Handbook of Counseling Psychology* (4th ed., pp.357–374). New York, NY: Wiley.
- Bix, S. A. (2004). From engineers to “girl engineers” to “good engineers”: A history of women's us engineering education. *National Women's Study Association Journal*, 1(1), 27-49.
- Bordei, S. (2017). How can one possibly determine the multiple intelligences? *Journal Plus Education*, 18(2), 204-212. <https://doi.org/10.24250/jpe/2/2017/SB>
- Career Key. (2023). Holland's theory of career choice and you. Retrieved from http://www.Careerkey.Org/Asp/Your_Personality/Hollands-Theory-Ofcareer-Choice.Html on 22nd April 2023.
- Cepni, S. (2007). *Research and project work*. Trabzon: Celep Printers.
- Chan, D.W. (2003). Multiple intelligences and perceived self-efficacy among Chinese secondary teachers in Hong Kong. *Educational Psychology* 23(5), 521-533.
- Chemeli, S. O. (2013). An assessment of the relationship between students' personality types and career aspirations in Eldoret West District, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (Jeteraps)*, 4(2), 383-391.

- Cherry, K. (2013). Psychology research with correlation studies. Retrieved from <http://psychology.about.com/od/researchmethods/a/correlational.html> on 22nd March, 2013.
- Cohen, H. (2012). What is intelligence and how is it measured? Retrieved <http://www.aboutintelligence.co.uk/what-intelligence.html> on 10th June, 2012.
- Cooijmans, P. (2013). Sex differences in intelligence. Retrieved from www.paulcooijmans.com/intelligence on 7th March, 2013.
- Cotter, E.W., & Fouad, N. A. (2011). The relationship between subjective well-being and vocational personality type. *Journal of Career Assessment* 19 (1), 51-60.
- Eid, R., & Alizh, I. (2004). Applying MI theory in teacher training programmes. *Resalt*. New York.
- Elfi, T. (2022). RIASEC Holland's reliability and validity on personality of informatics engineering education students in higher education, 8(1), 11-21. Retrieved from <https://jurnal.iicet.org/index.php/jppit> on June 10th 2022.
- Eurostat (2004). Highest proportions of graduates in science in Sweden, Ireland and France. *News Release 11(1)*, 69 -83.
- Feldman, K. A., Ethington, C. A., & Smart, J. C. (2006). A further investigation of major fields and person-environment fit: Sociological vs. psychological interpretations of Holland. *Journal of Higher Education*, 72, 670-698.
- Freinkel, H. R., & Wallen, N. E. (2008). *How to design and evaluate research in education*. New York: McGraw-Hill
- Fred, F. D. (2012). *Personality characteristics and vocational choice. A test of Holland's theory*. [Unpublished master of education project]. University of Ibadan. Ibadan.
- Furnham, A., & Baguma, P. (2012). Self-estimates of intelligence: A cross cultural study from three continents. *North America Journal of Psychology*, (1), 69-78.
- Furnham, A., Petrides, K. V., Tsaousis, I., Pappas, K., & Garrod, D. (2005). A cross-cultural investigation into the relationships between personality traits and work values. *The Journal of Psychology*, 139, 5-32.
- Gallup Africa International. (2012). *The status of higher education in Kenya*. Retrieved from <http://www.gallupafrica.com> on 3rd September, 2012
- Garcia-Sedan, M., Jose, I., Navarro, J. I., & Immaculate, M. O. (2010). Relationship between personality traits and vocational choice. *Psychological Reports*. 105, 1- 10.

- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences* (1st ed.). New York: Basic Books.
- Gardner, H. (1999). *Multiple intelligence: The theory in practice*. New York: Basic Books.
- Gardner, H. (2000). *Intelligence reframed: Multiple intelligence for the 21st century*. New York: Basic Books.
- Gardner, H. (2003). *Multiple intelligences after 20 years*. A paper presented at the American Educational Research Association on 21st April 2003. Chicago: Illinois.
- Gardner, H. (2006). *Development and education of the mind: The selected works of Howard Gardner*. London: Routledge.
- Gardner, H. (2012). The nine types of intelligences. Retrieved from <http://www.skyview.vansd.org/ischimdt/Projects/The%20Nine%20Types%20> on 20th October, 2012.
- Ghazi, R. S., Shahzada, G., Gilani, U. S., Shabbir, N. M., & Rashid, M. (2011). Relationship between students' self-perceived multiple intelligence and their academic achievement. *International Journal of Academic Research*, 3(2), 619 -623.
- Gilman, L. (2012). Development of MI theory. Paper submitted for intelligence website. Retrieved from <http://www.Indiana.edu/-intell/mitheorys.html> on 17th September, 2012.
- Gitonga, C. M. (2012). *The relationship between Holland's personality types, gender, congruence and satisfaction with degree programs among third year students*. [Doctoral thesis, Kenyatta University].
- Gitonga, C. M., Orodho, J. A., Kigen, W., & Wangeri, T. (2013). Gender differences in Holland personality types. *International Journal of Education and Research*, 1(7), 42 -53.
- Glaser, B., Calhoun, G., Bates, J., & Bradshaw, C. (2003). Self-reported career interests among adjudicated male adolescents: A pilot study. *Journal of Addictions & Offender Counseling*, 33(1), 73 -91.
- Göğebakan, D. (2003). *How students' multiple intelligences differ in terms of grade level and gender*. [Doctoral thesis, Middle East Technical University].
- Gottfredson, G., & Duffy, R. (2008). Using a theory of vocational personalities and work environments to explore subjective well-being. *Journal of Career Assessments*.16 (44), 44-59.

- Gottfredson, G., & Holland, J. (1996). *Dictionary of Holland occupational codes*. Lutz, FL: Psychological Assessment Resources, Inc.
- Government of Kenya. (2007). *Career guidance practices in Kenyan high schools*. Nairobi: Government Printer.
- Government of Kenya. (2012). *Re-alignment of education sector to the constitution of Kenya 2010: Towards globally competitive quality education for sustainable development*. Nairobi: Government Printer.
- Greenhaus, J. H., Callanan, G. A., and Godshalk, V. M. (2019). *Career management for life (1st ed.)*. Routledge, New York.
- Green, D. C. (2010). *Perceptions of usefulness using Holland code theory, multiple intelligence theory and role model identification to determine a career niche in the fashion industry for first quarter fashion students*. [Doctoral dissertation, Kent State University College and Graduate School]. North Carolina.
- Gudo, G. (2012). University expansion in Kenya and issues of quality education: Challenges and opportunities. Retrieved from <http://www.semanticscholar.org/papr/Universityon> 27th July, 2012.
- Hall, S. (2010). The relationship between gender and career choice. Retrieved from www.Ehow.com on 17th September, 2010.
- Hanafiyeh, M. (2013). The relationship between Iranian Efl learners' multiple intelligence and success in foreign language learning. *Asian Journal of Management Sciences and Education*, 2(1), 273 -290.
- Helwig, A., & Myron, M. (1997). Ten-year stability of Holland codes within one family. *The Career Development Quarterly*, September (46), 62 - 72.
- Hogan, J. & Holland, B. (2003). Using theory to evaluate personality and job-performance relations: A Socioanalytic perspective. *Journal of Applied Psychology*, 88(1), 100-112.
- Hossain, R (2023) Personality and Career Choice <https://doi.org/10.https://www.researchgate.net/publication/37390257> .Page No: 121-135,
- Holland, J. L. (1997). *Making Vocational choice: A theory of vocational personalities and work environment*. Englewood Cliffs, NJ: Prentice-Hall.
- Hollandcodes.com. (2012). Holland codes career models. Retrieved from http://www.hollandcodes.com/Holland_Code_career.html on 8th December, 2012.

- Hull-Blanks, E. (2005). Career goals and retention-related factors among college freshmen. *Journal of Career Development, 32*(1), 16 – 30.
- Hunter, A. (2021, April 9). Recognizing multiple intelligences: An interview with Dr. Howard Gardner. *Brain World*. Retrieved from <https://brainworldmagazine.com/recognizing-multiple-intelligences-qa-howard-gardner/> on 30th August, 2021.
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60*, 581-592.
- Ishhq, H., Maqsood, A., Syed, A. M., & Sardar, F. (2010). Perceptions of students regarding adaptability of MI at elementary level in Khyber Pakhtunkhula. *Journal of Education and Sociology*. ISSN 2078-032.
- Issa, A. O., & Nwalo, N., (2008). Factors influencing the career choice of undergraduate students in Nigeria library and information science. *African Journal of Library Archives and Information Science, 18*(1), 23 -32.
- Johnson, K., & White, J. (2002). The use of multiple intelligences in criminal justice education. *Journal of Criminal Justice Education, 13*(2), 369-386.
- Johnson, M. (2007). *The effect of multiple intelligences on elementary student performance*. [Unpublished master's thesis]. Dominican University of California.
- Kalambuka, P. (2010, December 17). It is not KCPE exam we should worry about but a failed education system. *The Daily Nation*. 13. Nairobi: The Nation Media Group.
- Kamau, C. (2010, December 3). Find your career in your passion. *The Standard*, 47. Nairobi: The Standard Group Centre.
- Kamuri, P. (2010, September 24). Personality matters when choosing varsity courses. *The Standard*, 43. Nairobi: The Standard Group Ltd.
- Kariuki, W. (2011, June 1). Change: Nontraditional careers suddenly become attractive. *The Standard*, 30. Nairobi: The Standard Group Ltd.
- Karugu, A. M., & Otiende, J. E. (2012). Higher education and work: A survey of graduates of Kenyatta University (1985-1994). Retrieved from www.2aau.org/karugu.pdf on 29th August, 2012.
- Kemboi, R. J., Kindiki, N., & Misigo, B. (2016). The relationship between personality types and career choices of undergraduate students: A case of Moi University, Kenya. *Journal of Education and Practice, 7*(3), 102-112.

- Kennelly, E., Sargent, A., and Reardon, R. (2018). RIASEC literature from 1953-2016: Bibliographic references to Holland's theory, research, and applications. *Florida State University: Tallahassee, FL, USA*.
- Kerka, S. (2012). Multiple intelligences and career development. *Trends and Issues Alert*, 8. Ohio: Clearinghouse on Adult, Career, and Vocational Education.
- Khataybeh, A. M., & Al-Bdor, A. (2006). The impact of using multiple intelligences in teaching science on acquiring science processes among 7th graders. *The Journal of Arab Gulf Message*, 85, 99-133.
- Kimani, G., & Kinyanjui, J. (2012). Assessment of the effectiveness of bachelor of education programme (B.Ed. Arts) in meeting job needs of graduates of University of Nairobi. Retrieved from www.2aau.org/-kimani.pdf on 29th August 2012.
- Kincheloe, J. L. (2004). *Multiple intelligences reconsidered*. New York. Basic Books.
- Kniveton, B. H. (2009). Influences and motives on which students base their choice of career. *Journal of Research in Education*, 72, 47-59.
- Ktoridou, D., Epaminonda, E., Arola, N. A., George, K. G., & Paschalis, A. (2014). The fit between major of study and personality type: An application of Holland's codes in Cyprus University of Nicosia. *Cyprus Icicte 2013 Proceedings*. www.Cytanet.Com.Cy.Unic.Ac: Cyprus.
- Lin, S. (2009). Gender and major differences in self-estimates of different aspects of Gardner's multiple intelligences: A study of the undergraduate pre-service teachers in Taiwan. *Asian Social Science*, 5(5). Retrieved from www.ccnnet.org/journal.html on 2nd May, 2010.
- Loori, A. A. (2005). Multiple intelligences. A comparative study between the preferences of males and females. *Social Behavior and Personality*, 33(1), 77-88.
- Lumei, C., & Turda, E. S. (2022). The role of theory multiple intelligences in primary education process. Retrieved from <http://www.europeanproceedings.com> on 16th January 2022.
- Lynn, R., Irwing, P., & Commck, T. (2001). Sex differences in general knowledge and intelligence. *Journal of Educational Research*, 30(1), 27-39.
- Mahasneh, A. M., (2013). The relationship between multiple intelligence and self- efficacy among sample of Hashemite University students. *International Journal of Education and Research*, 1(5), 75 -84.

- Mantzaris, J. (2012). Adding a dimension to career counseling. *Focus on Basics*, 3(1), 26 -43. Retrieved from <http://ncsall.gseweb.harvard.edu/fob/1999mantzari.html> on 29th October 2012.
- Marens, M. (2020). Gardner's theory of multiple intelligences. Retrieved from <https://www.simplypsychology.org/multiple-intelligences.html> on 6th December, 2021.
- Matto, H., Berry-Edwards, J., Hutchinson, E. D., Bryant, S. A., & Waldbilling, A. (2006). Teaching notes: An exploratory study on multiple intelligences and social work education. *Journal of Social Work*, 42 (2), 405-416.
- Menevis, I., & Efe, B. (2014). Do age and gender influence multiple intelligences? *Social Behavior and Personality*, (42), 9-20.
- Migunde, Q. A. (2011). *Factors influencing career choice among form four secondary school students in Kisumu municipality, Kenya*. [Unpublished master's thesis]. Maseno University.
- Migunde, Q., Agak, J., & Odiwuor, W. (2011). Career aspirations and career development barriers of adolescents in Kisumu Municipality, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, 2 (5), 320-324.
- Miller, M. (2012). Do types influence types? Examining the relationship between students' and parents' Holland codes. *College Student Journal*. Retrieved from <http://frindarticles.com/p/articles/mi> on 15th December 2012.
- Morgan, H. (2016). Relying on high-stakes standardized tests to evaluate schools and teachers: A bad idea. *The Clearing House*, 89(2), 67-72.
- Morgan, H. (2021). Howard Gardner's multiple intelligences theory and his ideas on promoting creativity. In F. Reisman (Ed.), *Celebrating giants and trailblazers: A-Z of who's who in creativity research and related fields* (pp.124-141). London, UK: KIE Publications
- Morris, C. (2012). Multiple intelligences and career implications. Retrieved from http://miresearch.org/files/Know_Thyself3.doc on 27th March, 2012.
- Mugenda A. G. (2011). *Social science research: Theory and principles*. Kijabe: Kijabe Printing Press.
- Muigai, P. K. (2007). *Students' perception on the influence of degree on career aspirations: A case of Moi University, Kenya*. [Unpublished master's thesis]. Moi University, Eldoret.

- Multiple Intelligence Tests. (2013). Retrieved from <http://www.nedprod.com/Niallstuff/Intelligencetest.html> on 29th March 20213.
- Muraya, F. M. (2011). *The role of career guidance in the choice of careers among students in public schools in Kenya: A case of Nakuru Municipality*. [Unpublished masters of philosophy thesis]. Moi University, Eldoret.
- Murphy, N. A., & Hall, J. A. (2011). Intelligence and interpersonal sensitivity: A meta-analysis. *Intelligence*, 39(1), 54-63.
- Murray, J., & Hall, P. (2001). Gender differences in undergraduate Holland personality types: Vocational and co-curricular implications. *NASPA Journal*, 39 (1), 14-29.
- Mustafa, S. A.Y., Saleh, M. A. J., & Onoz, S. M. (2014). Types of multiple intelligences among undergraduate students at Yarmouk University in light of Gardner's theory. *International Journal of Humanities and Social Science*, 4(6), 117 -131.
- Mweru, M., & Njuguna, J. N. (2009). *Personality development*. Nairobi: Longhorn.
- Naderi, H., Abdullah, R., & Aizan, H. T. (2008). Male versus female intelligence among undergraduate students: Does it matter? *Asian Journal of Scientific Research*, 1, 539 – 543.
- National Center for Education Statistics. (2010). *Fast Facts, 2010*, nces.ed.gov, Washington, DC.
- Net, F., Ruiz, F., & Turnham, A. (2008). Sex differences in self-estimation of multiple intelligences among Portuguese adolescent. *High Ability Studies*, 19(2), 189-204.
- Nistal, M. T., Fernández, J. K. M. S., & Frannia A. P. Z. (2019). The structural validity of Holland's and Gati's RIASEC models of vocational interests in Mexican students. *Electronic Journal of Research in Educational Psychology*, 17(49): 707–30.
- Njoroge, A. (2019). *Academic staffing and implication on the quality of bachelor of education program in selected public Universities in Kenya*. [Unpublished doctoral thesis]. Kenyatta University.
- Nofal, M., & Al-Heeled, M. (2008). Differences in multiple intelligences among 1st year students of higher education institutions at Unrwa in Jordan. *The Journal of Al-Najah for Research*, 22(5), 1599-1623.
- Obora, H. (2012). Talent testing and psychometric kits to identify one's career. Retrieved from www.Acgt.com on 23rd December 2012.

- Okatcha, R. J., Grigorenko, E., Nokes, C., Prince, R., Bundy, D. A., & Sternberg, R. J. (2012). The relationship between academic and practical intelligence. A case study in Kenya. *Intelligence*, 29,401-418.
- Okatcha, R. J., Grigorenko, E., Prince, R., Nokes, C., Geissler, P. W., Kenny, D. A., Bundy, D. A., & Sternberg, R. J. (2012). The organization of Luo conceptions of intelligence: Study of implicit theories in a Kenyan village. *International Journal of Behavioral Development*, 25(4), 367 -378.
- Onoyase, D., & Onoyase, A. (2009). The relationship between personality type and career choice of secondary school students in the federal government colleges in Nigeria. *Nigeria Journal of Guidance and Counseling*, 11(2), 102 -115.
- Organization for Economic Co-operation and Development. (2003). *Career guidance and public policy: Bridging the gap*. Ioc/Ec/2003/5. Paris.
- Oriedo, M. (2011, June 1). Moving with the times in career choices. *The Standard*. Nairobi: The Standard Group Ltd.
- Orodho, A. J. (2009). *Elements of education and social science research methods*: Nairobi: Kanezja Publishers.
- Orodho, A. J. (2012). *Techniques of writing research proposals and reports in education and social science*. Nairobi: Kanezja Publishers.
- Özdemir, P. Güneysu, S., & Tekkaya C. (2006). Enhancing learning through multiple intelligences. *Educational Research*, 40(2), 74-78.
- Ozgen, K., Tataroglu, B., & Alkan, H. (2011). An examination of multiple intelligence domains and learning styles of pre-service mathematics teachers. Their reflections on mathematics education. *Educational Research and Reviews*, 6(2), 168 -181.
- Özturk, S., Nazan, Y. N., Hacıoglu, G., Kiray, A., Ezilmez, B., Soylemezoglu, E., Cetin, H., & Sonme, R. (2014). Emotional intelligence characteristics of students studying at various faculties and colleges of universities. *European Scientific Journal*, 8(8), 1857-7431.
- Passadino, D. (2021). *The theory of multiple intelligences in special education music classroom* [Master's thesis, Liberty University].
- Pervin, L., Cerrone, D., & John, O. (2005). *Personality theory and research*. USA: John Wiley and Sons.
- Pike, G. (2006). Vocational preferences and college expectations: An extension of Holland's principle of self- selection. *Research in Higher Education*, 47(5), 591-612.

- Porter, S. R., & Umbach, P. D. (2006). College major choice: An analysis of person-environment fit. *Research in Higher Education*, 47, 429–449.
- Psychometric Assessment for Selection and Development. (2012). Description of six Holland types. Retrieved from <http://www.psychmetrics.co.uk/est.html> on 27th October 2012
- Ranson, G. (2003). Beyond gender differences: A Canadian study of women and men careers in engineering. *Gender, Work and Organization*, 10(1), 22-41.
- Razmjoo, S. E. (2008). On the relationship between multiple intelligences and language proficiency. *The Reading Matrix Volume*, 8(2), 771-796.
- Reggio, R. E., Murphy, S. E. & Pirozzolo, F. (2002). *Multiple intelligences and leadership*. New jersey: Lawrence Erlbaum Associates, Inc.
- Robbins, S. P., and Judge, T. A. (2019). *Organizational behavior*. Pearson Education Limited, pp. 134-157.
- Ryckman, R. (2004). *Theories of personality*. Belmont CA: Thomson/Wadsworth.
- Saeedi1, N., Pazvari, M. H., Saeid, S. A., & Mousavian, S. I., (2012). Studying the influence of emotional intelligence on career success. New Jersey: Textroad.
- Samora, M. (2010, December 2010). Forget trends, base career choice on your abilities. *The Daily Nation*, 6. Nairobi: The Nation Media Group Ltd.
- Serin, N. B., Serin, O., Yavuz, A., & Muhammedzade, B. (2009). The relationship between the primary teachers' teaching strategies and their strengths in multiple intelligences. *Procedia Social and Behavioral Sciences*, 1, 709 -712.
- Shahzada, G., Ghazi, S. R., Khan, H. N. & Iqbal, S. (2011). Self-perceived multiple intelligences of male and female. *Mediterranean Journal of Social Sciences*, 2(1), 138 -147.
- Shariffudin, R. S. (2010). *The pattern of personality types, multiple intelligence and critical thinking preferences for high achievers*. Malaysia research paper presented to Fakulpendidikan, Universititeknologi.
- Shearer, C. B. (2006). *Math skill and multiple intelligence: An investigation into the MI profiles of high school students with varying levels of math skill*. Ohio: Multiple Intelligence Consulting Inc.
- Shearer, C. B. (2006). *Reading skill and multiple intelligence: An investigation into the MI profiles of high school students with varying levels of reading skill*. Ohio: Multiple Intelligence Consulting.

- Shearer, C. B. (2006). *Using a multiple intelligence assessment to facilitate teacher development*. Kent: Ohio. MI Research and Consulting.
- Shearer, C. B. (2007). *Multiple intelligence development assessment scales*. Kent Ohio: I Research Consulting Inc.
- Shearer, C. B. (2009). Exploring the relationship between intrapersonal intelligence and university students' career confusion. Implications for counseling academic success and school-to-career transition. *Journal of Employment*, 46, 52 – 61.
- Shearer, C. B., & Luzzo, D. A. (2009). Exploring the application of multiple intelligence theory to career counseling. *Career Development Quarterly*, September, 2009.
- Smart, J. C., Feldman, K. A., & Ethington, A. E. (2000). *Academic disciplines: Holland's theory and the study of college students and faculty*. Vanderbut, Nashville: University Press.
- Sternberg, R. J. (2003). *A handbook of intelligence*. Cambridge: Cambridge University Press.
- Sternberg, R. J. (2018). *The nature of human intelligence*. Cambridge: Cambridge University Press.
- Su, R., Rounds, J., & Armstrong P. (2009). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*. 135(6), 859–884.
- Tang, M., Pau, W., & Newmeyer, M. D. (2013). Factors influencing high school students career aspiration. *Journal of Professional School Counseling*. Retrieved from www.acesmylibrary.com on 15th February 2013.
- Tariq, S., Majoka, M. I. & Hussain, S. (2011). A study to investigate emotional intelligence of male and female students at university level in Pakistani context. *Interdisciplinary Journal of Contemporary Research in Business*, 2(10), 209-218.
- Tirri, K., & Nokelainen, P. (2008). Identification of multiple intelligences with the multiple intelligences profiling questionnaire III. *Psychology Science Quarterly*, 50(2), 206 – 221.
- Toomey, K. D., Levinson, E. M., & Palmer, E. J. (2009). A test of Holland's theory of vocational personalities and work environments. *Journal of Employment Counseling*, 2(6), 324-361.
- Tsai, M. Y (2016) Research on multiple intelligences of junior high school students with different background variables. *Journal of Modern Education*, 6(1), 10-18. [https://doi.org/10.15341/jmer\(2155-7993\)/01.06.2016/002](https://doi.org/10.15341/jmer(2155-7993)/01.06.2016/002)

- Vigna, D. (1996). *Holland typology, person-environment congruence and job satisfaction for international interior design association members*. [Doctoral dissertation, The University of Nebraska]. Lincoln.
- Wagah, M. O., Indoshi, F. C., & Agak, J. O. (2010). Factors that determine students' and teachers' attitudes towards art and design curriculum. *International Journal of Vocational and Technical Education*, 2(1), 9-17.
- Wais, S. E., Firker, A., & Henning, J. (2007). Association between the second to fourth digit ratio and career interest. *Personality and Individual Differences*, 43(3), 485 – 493.
- Wambugu, A., Onsomu, E., & Munga, B. (2010). *Unemployment in Kenya: A situational analysis, paper No. 1/2010*. National Economic and Social Council (NESC): University of Nairobi.
- Webometrics. (2023). Webometric university ranking. Retrieved from www.webometrics.info/en/Africa on 5th April 2023
- Wendy, J. B., & Johnson, T. (2007). Sex different in mental abilities masks the dimensions on which they lie. *Intelligence*, 35, 23 -39.
- Wilhelm, P. G. (2012). The relationship of Holland's vocational typology and personality theory, gender and miner's four types of entrepreneurs: Implications for education. Retrieved from www.redorbit.com on 16th December 2012.
- Wilson, L. O. (2010). Newer views of learning-exploring the ninth intelligence. Retrieved from <http://www.uwsp.edu/Wilson/learning/ninethintelligence.html> on 22/12/2010.
- Wilson, S. D. (2018). Implementing co-creation and multiple intelligence practices to transform the classroom experience. *Contemporary Issues in Education Research (CIER)*, 11(4), 127-132. Retrieved from <https://doi.org/10.19030/cier.v11i4.10206> on 6th November 2019.
- Woods, S. A. & Hampton, S. E. (2010). Predicting adult occupational environments from gender and childhood personality traits: *Journal of Applied Psychology*, 95(6), 1045–1057.
- Yamin, W. A. (2013). *Types of mathematical thinking and its relationship with multiple intelligences and the desire in the specialization and achievement among tenth graders in Palestine*. [Unpublished master's thesis]. Al-Najah National University.
- Yavich, R., & Irina R. (2020). Multiple intelligences and success in school studies. *International Journal of Higher Education*, 9(6), 202 URL: <https://doi.org/10.5430/ijhe.v9n6p107>

- Yazdanimoghaddam, M., & Khoshroodi, B. S. (2010). The relationship between teachers teaching efficacy and their multiple intelligence. *Journal of Language and Translation, 1*(2), 33-45.
- Zainudin, Z. N. (2020). The relationship of Holland theory in career decision making: A systematic review of literature. *Journal of Critical Reviews 7*(9): 84–92.

APPENDICES

APPENDIX A: STUDENT'S QUESTIONNAIRE

Dear Respondent;

My name is Richard Juma Atela. I am a postgraduate student undertaking a Doctorate degree in Counseling. You have been selected as a respondent in this study on the **Types Of Intelligence, Personality Types and Their Relationship with Gender and Career Choice Among Undergraduate Students in A Selected Public University, Kenya**

I am kindly requesting you to fill this questionnaire for me. Your sincere responses will be highly appreciated. Be assured that the information given in this study will be treated in confidence and it is of value to my research only. The information obtained in this study is hoped to be of great importance to stakeholders and policy makers in career choice admission among university students.

INSTRUCTIONS:

- **Please Do Not Write Your Name.**

The questionnaire consisted of two parts:

- PART ONE

Respondent's gender and degree programme (career choice).

- PART TWO,

Section A consisted of self-scoring statements that describe a type of intelligence.

Section B consisted of self-scoring statements that describe a personality type.

Section C sought to establish the Career Choice (5choice; 50 stems) of the

PART ONE

1. Gender: - Male
Female
2. What is your career choice in the university Undergraduate B.Ed Degree?
Programmes (Please tick (√) one)
 - B.Ed- Arts (IT)
 - B.Ed- Science (IT)
 - B.Ed –Special Needs (IT)
 - B.Ed- French (IT)
 - B.Ed- ECDE (IT)

PART TWO

SECTION A: QUESTIONNAIRE FOR TYPES OF INTELLIGENCE

1. Below is a list of statements on types of intelligence. Read them carefully and tick (√) appropriately in one box to show how much the statement describes your intelligence(s).

STATEMENT	1. Describes me completely	2. Describes me fairly well	3. Unsure	4. Doesn't describe me very well	5. Doesn't describe me at all
I prefer subjects such as English, History					
I can identify different musical instruments					
I can express myself orally or in writing. I am good story teller					
I am ever troubled with issues like holiness, virginity, conscious					
I have a realistic idea of my own strengths and weaknesses.					
I am knowledgeable on how the body works and health issues.					
I need to group things to properly appreciate their relevance.					
I can hold my own in arguments or debates.					
I appreciate the art					
I would prefer to be at a party rather than home alone watching TV.					
I enjoy working with numbers and can do mental calculations					
I talk over problems with others rather than trying to resolve them by myself					
I tend to make a visual record of events with a camera or phone					
I don't mind getting up on the dance floor.					
I enjoy working with a group or committee?? Or community??of people.					
I often make my point by providing a diagram.					
Math and Science are my favourite subjects.					
I use gestures or other kinds of body language to express myself.					
I always wonder where animals go when they die					

I communicate well with people and can help resolve disputes.					
I like reading books, magazines, newspapers, even product labels					
I can play a musical instrument					
People sometimes have to ask me to explain a word I have used.					
I can recognize and name different types of trees, flowers and plants.					
I believe there are angels, 'jinks', ghosts, blessings, curses					
I can dismantle an object and put it back together.					
I like to talk through problems, explain solutions, and ask questions					
People tend to come to me for advice.					
I like lessons in art and prefer geometry.					
I like a musical background when reading or working					
I take great pride in being a mentor to someone else.					
I prefer a reading material that is illustrated.					
I sometimes imagine reversed roles e.g. animals undertaking the roles of humans and vice versa					
I believe there other dimensions of issues					
I like to put detailed itinerary for vacations or business trips					
I like games involving other people such as bridge, Monopoly					
I have an understanding of environmental issues.					
I can sing on key					
I am quite adept at 'do-it-yourself'					
I take part in a sport or regularly perform some kind of physical exercise.					
I often whistle or hum a tune.					
I need to physically handle something to fully understand it					
I take the lead; showing other peoples how to get things done.					
I enjoy word play, making puns, tongue-twisters, limericks.					
I enjoy jigsaw puzzles and mazes.					
I believe and question, birth,					

death, child innocence, ageing					
I value conservation of resources and achieving sustainable growths					
I take a systematic, approach to problem solving.					
I always wonder why some people are evil, while others are good					
I am conscious of wildlife. I can 'read' weather signs.					
I enjoy the challenges of brain teasers or puzzles.					
I am interested in new scientific advances					
I find myself doodling when taking notes or thinking through something.					
I always wonder where I came from, how I got here and where I will go.					
I find myself tapping in time to music.					
I punctuate my conversation with allusions to things I have read or heard.					
I can find specific examples to support a general point of view.					
I often listen to music at home and in a vehicle					
I can visualize how things look from a different perspective.					
I keep a personal diary or log to record my innermost thoughts.					
I am reasonably informed about astronomy, universe.					
I like to think through problems while engaged in physical activity such as walking or jogging.					
I like to go out by myself or I am happy with my own company.					
I have no problem reading maps and navigating.					
I envision myself as a farmer or fisherman.					
I have a private hobby or interest which I don't really share with anyone.					
The most enjoyable classes are PE and handicrafts lessons.					
I can't imagine life without music					
I like rough and tumble play with children.					

I am interested in social issues and psychology.					
I have set my own goals. I know where I am coming from and where I am going.					
Theme music or jingles often pop into my head.					
I need to tackle a new learning experience 'hands on' rather than reading a manual or watching its video.					
I keep or like pets.					
I believe in heaven or hell and there is life in other planets					
I am an independent thinker- I know and make up my own mind					
I work for myself – or have contemplated doing my own thing.					
I like to do crosswords, play Scrabble, Word puzzles.					
I tend to find the logical flaws in things people say and do					
I have attended self-improvement workshops or counseling.					
I always question what life, death, and healing are					
I am a keen gardener/farmer.					
Usually, I can remember a tune after hearing it just a couple of times.					
I have several very close personal friends.					
I like the most thrilling rides at the fun fair.					
I can easily balance my accounts; do the household budget					
I can readily absorb information from the radio or audio sources					
I prefer team sports –such as basketball, football -to individual sports such as swimming and running.					

SECTION B: QUESTIONNAIRE FOR PERSONALITY TYPES

2. Below is a list of statements on personality types. Please read them carefully and tick (√) appropriately in one box to show how much the statement describes your personality type(s).

STATEMENT	1. Describes me completely	2. Describes me fairly well	3. Unsure	4. Doesn't describe me very well	5. Doesn't describe me at all
My interest is in scientific activities					
I am frank and honest					
I am artistically oriented.					
I am social, cheerful, popular and responsible					
I have great facility with words					
I prefer highly ordered verbal and numerical activities					
I am shy and thrift					
I don't like highly structured problems					
I am concerned with the welfare of others					
I am domineering and always energetic,					
I prefer office work in a large organization					
I tend to be creative and original.					
I am impatient with precise work.					
I am independent, original and intense					
I get along with others					
I like power and leadership status					
I prefer self expression through artistry e.g. media.					
I prefer to remain less assertive about opinions and capabilities.					
I do not prefer work involving intense relationships with others					
I prefer to work in expensive settings					
I do not like working with heavy machinery.					
I am confident and prefer social tasks.					

I am independent and introverted.					
I can solve abstract problems.					
I like solving problems by discussing with others.					
I don't like activities requiring great physical strength.					
I like group situations.					
I am rational and reserved.					
I value material wealth.					
I am impulsive and emotionally expressive.					
I enjoy persuading others with my view points.					
I like seeking attention.					
I am practical and physically strong.					
I am not particularly interested in working around people.					
I can arrange/rearrange relationships.					
I would be comfortable working in a well established chain of command.					
I am dependable and well controlled					
I like or recognize music.					
I have trouble communicating my feelings to others.					
I consider myself a good leader.					
I like working outdoors					
I hate ambiguity and prefer to know what is expected of me.					
I respond well to power and orders.					
I like working with, large powerful tools					
I enjoy ambiguous challenges.					
I value material possessions and status.					
I can systematically think through a problem,					
I am very enthusiastic, adventurous.					
I am analytical, curious and					

methodological.					
I do function optimally in structured situations with many rules.					
I enjoy creating things with my hands.					
I can express myself well					
Idea or people interest me least.					
I have little interest in tasks requiring physical skills					
I can't withstand long periods of intellectual efforts					
I am persuasive and conforming.					
I am initiative but disorderly.					
I prefer to work alone.					
I can control body movements.					
I do not like seeking leadership.					

SECTION C: QUESTIONNAIRE FOR CAREER CHOICE

3. Below is a list of statements on B.Ed careerchoice. Please read them carefully and tick (√) appropriately in one box to show how much the statement describes your describe your career choice in the B.Ed programmes.

STATEMENT	1. Describes career choice completely	2. Describes career choice fairly well	3. Unsure	4. Doesn't describe career choice very well	5. Doesn't describe career choice at all
Involves performing science experiments					
Attached to special unit/rehabilitation centre					
Studies characteristics of society, past, present and future					
Apply formulae and statistics in computation					
Building scientific attitude through analytical and synthetic approaches					
Analyses language, structure and teaching					
Dealing with early childhood development and education practices					
Involves using teaching aids like globe, charts, bulletin boards, maps					
Practices and engages in safe and ethical use of laboratory technology					
May involve working in rehabilitation centers and therapeutic units					
Education for social, religious, philosophical and critical thinking					
Involves studies in poetry, grammar, short stories and essay					
Accepting discovery learning through recording observations					
Subjects under study may					

include history, religious studies,					
Involves dealing with learners with disabilities					
Involves refuting and proving scientific claims					
Involves keeping a diary of experimental work in sciences					
Even tempered, firm, helpful ,creative, and empathetic even in difficult situations					
Involves specific child activities such as mathematical, language, science, creative activities					
Involves stories, proverbs, idioms, synonyms					
Methods of teaching include narration, discussion, project, dramatization					
Involves institutive, watchful and empathetic to learners needs					
Involves essay writing, letter writing, report writing					
Pictures, posters, cartoons and CALL					
Use of Input/output devices, internet, e-mail, websites, PowerPoint					
Use of vocabulary, homophones, homographs, diagnostic works homonyms					
Involves Drill work, review work, problem solving and diagnostic work					
Involves Met?? cognitive and inductive, constructivist approaches					
Tenses, active-passive voice patterns and					

transformation of sentences					
Memorization of facts, dates, place names, events and phenomena					
Involves learning child welfare, care and support services					
Involves training to work with exceptional learners					
Learning –teaching resources include botanical gardens, , sky observation, aquariums, science clubs					
Good communication skills with learners, peer helpers, parents, therapists					
Exhibits collaborative learning, respecting the validity of scientific investigations					
Skills of inferring, reading, writing, spelling and pronunciations					
Involves sign language, use of special devices such as hearing aids, crutches					
Use of computer simulations and systems in teaching					
Maximum utilization of visible aids, models					
Child psychology is central to the study					
Accept and encouraging learners despite their weaknesses and capabilities					
Involves pedagogical skills of learning and teaching process					
Involves use of slides, OHP, computer and projective aids					
Opportunities to study and interact with child plays					

and play materials					
Subject combinations include biology, chemistry, physics					
Conservation of genetic diversity, energy resources					
Emphasizes integration and inclusive education for all					
Involves studies of languages like French English, German, Kiswahili					
Teaching practice/ attachment is an important component in career preparation					
Involves training in Methods of teaching early childhood children					

THANK YOU FOR YOUR HONEST AND OBJECTIVE RESPONSES

APPENDIX B: INTERVIEW SCHEDULE

Dear Interviewee;

My name is Richard Juma Atela. I am a postgraduate student undertaking a Doctorate degree in Guidance and Counseling. You have been selected as a very informative respondent in this study on the **Types of Intelligence, Personality Types and Their Relationship With Gender And Career Choice Among First-Year Undergraduate Students in a Selected Public University, Kenya.**

I am kindly requesting to interview you as an authority in my field of study. Your sincere responses will be highly appreciated. This interview will be recorded with your informed consent. This will ensure accountability and legitimacy when communicating and sharing the findings of the study. Be assured that the information given in this study will be treated in high confidence and of value to my research only. The information obtained in this study is hoped to provide a useful guide to students, faculty advisors, researchers, education policymakers, career counselors and college admission officers for career choice, training, retention efforts, counseling and placement.

ACCEPTANCE:

Interviewer: Name: Richard Juma AtelaSign.....Date.....

Interviewee: Name:Sign.....Date.....

1. a).What do you understand by intelligence?
2. In what ways do consider yourself intelligent?
3. a). Do undergraduate male and female students in possess different types of intelligence?
b). If YES, which are some of the areas in the B.Ed programmes that males and female students display different types of intelligence
4. What are some of the unique talents/skills/ abilities or interests you possess which the current B.Ed programme does not address?
5. Do you think each B.Ed programme in a public university require different types of Intelligence? If YES what are some of the subjects, activities which are unique to your B.Ed career choice
6. (a) What are some of personality traits possessed by you possess which you find relevant and unique to their B.Ed choice?

(b) Do male and female B.Ed students display the same personality interests?
7. a) Do you think admission and progress into university education and training should be based on performance in examinations only?

(b) If NO, what other parameters should be considered?
8. Which are some of the university degree training programmes which in your opinion do not require excellent scholastic intelligence?

THANK YOU

APPENDIX C: RESEARCH ETHICS PERMIT



MASENO UNIVERSITY SCIENTIFIC AND ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

REF: MSU/DRPI/MUERC/00916/20

Date: 17th October, 2022

TO: Richard Juma Atela
PG/PHD/00111/2010
Department of Educational Psychology
School of Education, Maseno University
P. O. Box, Private Bag, Maseno, Kenya

Dear Sir,

RE: Types of Intelligence, Personality Types and their Relationship with Career Choices among Undergraduate Students, Maseno University, Kenya

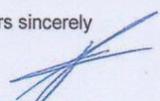
This is to inform you that Maseno University Scientific and Ethics Review Committee (MUSERC) has reviewed and approved your above research proposal. Your application approval number is MUERC/00916/20. The approval period is 18th October, 2022 – 17th October, 2023.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Maseno University Scientific and Ethics Review Committee (MUSERC).
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Maseno University Scientific and Ethics Review Committee (MUSERC) within 24 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Maseno University Scientific and Ethics Review Committee (MUSERC) within 24 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to Maseno University Scientific and Ethics Review Committee (MUSERC).

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely


Prof. Philip O. Owuor, PhD, FAAS, FKNAS
Chairman, MUSERC



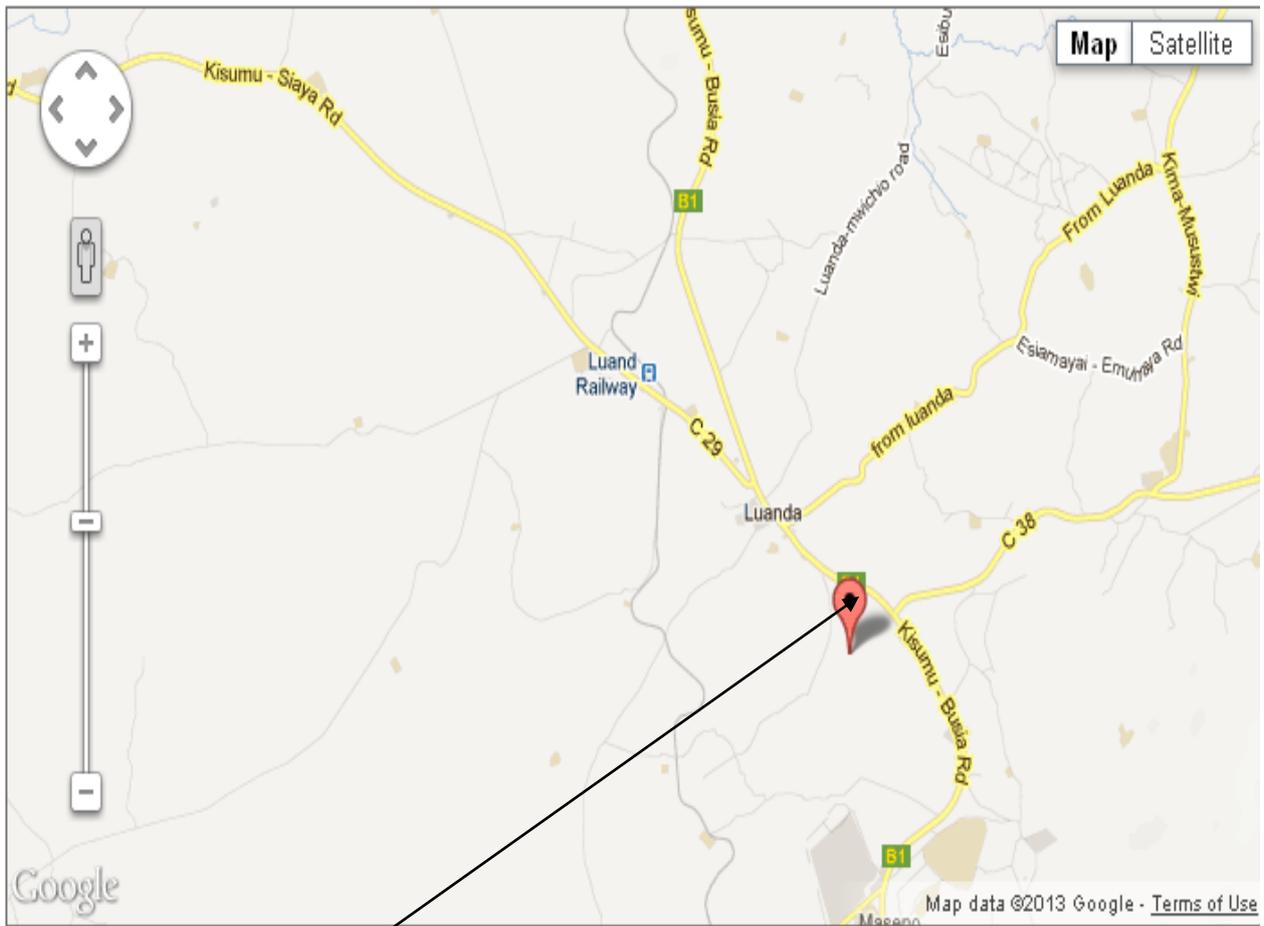
MASENO UNIVERSITY IS ISO 9001 CERTIFIED



APPENDIX D: NACOSTI PERMIT

 <p>REPUBLIC OF KENYA</p>	 <p>NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION</p>
Ref No: 565675	Date of Issue: 13/July/2022
RESEARCH LICENSE	
	
<p>This is to Certify that Mr.. Richard Juma Atela of Maseno University, has been licensed to conduct research in Kisumu on the topic: RELATIONSHIP BETWEEN TYPES OF INTELLIGENCE, PERSONALITY TYPES AND CAREER CHOICES AMONG UNDERGRADUATE STUDENTS OF MASENO UNIVERSITY, KENYA for the period ending : 13/July/2023.</p>	
License No: NACOSTI/P/22/18686	
565675 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
<p>NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.</p>	

APPENDIX E: MAP OF MASENO UNIVERSITY, KENYA



Public University