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Individual Career Guidance Approach for Science Subject Selection among Public Secondary School Students of Karagwe District, Tanzania

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Abstract
The study investigated how individual career guidance enhances the selection of science subjects among public secondary school students of Karagwe District. Anchored in Expectancy-Value Theory (EVT), the study employed a convergent design within the mixed methods approach. The study targeted 31 heads schools (HSs), 1225 students, and 31 teacher counselors (TCs) in 31 public secondary schools, and one District Education Officer (DSEO). The sample included 120 students, 10 TCs, 10 HSs, and 1 DSEO obtained through simple random, total population, and stratified random sampling techniques. Quantitative data were collected through questionnaires, while qualitative data were collected through interview guides and focus group discussion guides whose validity were made certain by research experts in the field of education. The reliability of .894 was established for students questionnaires based on the Likert-type items using Cronbach's Alpha technique while peer debriefing and triangulation methods were used for qualitative data. The quantitative data were descriptively analyzed with the aid of SPSS version 22 while qualitative data were subjected to a thematic analysis that involved familiarization, coding, topic generation, theme review, theme definition and name, and writing up. Ethical guidelines for research were conformed, which included obtaining approval for the study, seeking informed consent, maintaining confidentiality and anonymity, properly attributing sources, and acknowledging papers According to the study, students in Karagwe District have chosen science subjects differently as a result of receiving individualized career counseling. Students appreciate the significance of one-on-one career counseling sessions in helping them define their interests and aspirations in science subjects. The study revealed further that students can better align their goals and receive tailored support by receiving personalized advice and guidance on science subjects. The study came to the conclusion that individual career counseling is a useful tool since teacher counselors are crucial in helping students receive guidance that could boost their interest in and aspirations for science courses. According to the report, teacher counselors should receive more training so they may proactively identify students who are struggling or unsure about their future career prospects and offer them specialized counseling and support.

Keywords: Individual career guidance, teacher counselor, career path, science subjects

Introduction

Career guidance plays a pivotal role in shaping an individual's future career choices. All secondary school systems, including traditional secondary education, offer this service. Numerous obstacles face students at this level, especially when it comes to choosing course combinations that correspond with their interests and desired careers (Holt-White et al., 2022). The availability of career guidance services helps students navigate these difficulties by providing them with information, resources, and support to make well-informed decisions. From this standpoint, the impact of career guidance services on students' choices of science subjects in ordinary secondary schools worldwide cannot be overstated. These services play a pivotal role in shaping students' career paths beyond their schooling years.

The need to assist people in making career decisions was recognized as early as the 20th century in China, when career advisory services first emerged. Due to this acknowledgment, career counseling services have been established in educational institutions and other companies across the globe (Dodd et al., 2022). The creation of career advice services was greatly aided by the United States of America (USA), especially when the National Career Development Association was founded in 1913. This marked the beginning of organized efforts to provide vocational guidance to students and adults. Unfortunately, inadequate and disorganized individual career guidance services in secondary schools have resulted in numerous students opting for careers based on their parents' preferences.

In the African context, where educational access has expanded, there is a growing number of highly skilled individuals struggling for a limited pool of available job opportunities (Ajayi et al., 2023). Due to this situation, career guidance programs have begun to appear in secondary schools with the goal of providing students with the information and abilities they will need for their future employment (Ajayi et al., 2023). According to Obiagu (2023), the Nigerian government places a strong emphasis on holding career seminars to help students explore a variety of science-related topics, comprehend possible career routes, and make well-informed decisions. Unfortunately, the inadequacy of teacher counsellors in most of the schools hinders the delivery of career seminars to individual students leading to a high number of students choosing inappropriate subject combinations.

In East Africa, career guidance services have been implemented since 2002 to help secondary school students make informed choices about vocational training and successfully transition into the job market (Otwine et al., 2022). Similarly, Ettu and Oyadeyi (2023) found that the government of Kenya offers career guidance services in secondary schools but faces challenges with students making incorrect career choices, resulting in high unemployment rates. The concern raised is the limited individual career workshops and seminars for teacher counsellors that could enhance the implementation of career guidance services in East Africa, particularly in Kenya. Additionally, Alloph (2022) found that Tanzanian public secondary school career advisory services were poor, which led to secondary school dropouts enrolling in unplanned professional training because it did not influence their choices for future professional training.

In 2015 Tanzanian government recognized the importance of career guidance and has developed several policies and frameworks to support its implementation Mmari, (2022). The National Skills Development Policy (NSDP) and the Technical and Vocational Education and Training (TVET) Development Programme (2013-2018) both include provisions for strengthening career guidance services. The Ministry of Education, Science, and Technology (MoEST) has also developed guidelines and training materials for career guidance practitioners in schools. Career guidance follows a comprehensive approach, addressing the holistic development of students providing a range of services such as individual and group counseling, career exploration activities, and industry-academia linkages Mkulu, (2020). Responsibilities of career guidance practitioners in Tanzania include assessing students' interests, aptitudes, and career aspirations, and providing counseling to help them explore options and set goals.

In Tanzania, ordinary secondary school education provides students with a wide range of subjects to study, including Mathematics, Physics, Chemistry, Biology, English, Kiswahili, Civics, Geography, History, Bookkeeping, Commerce, Agriculture, Computer Studies, Food and Nutrition, Bible Knowledge, and Islam. Upon entering form three, students must undertake the vital responsibility of choosing courses for their preferred combinations, which will eventually mold their future professional trajectories. Students can choose to focus on business, science, the arts, or commerce (MoEST, 2015). In light of the expressed issues, research on the viability of individualized career counseling in public schools is therefore required.

Despite the presence of career guidance services aimed at assisting students in their subject combination choices in ordinary secondary schools in Tanzania, there continues to be a persistently small number of students opting for science subjects (Chilewa and Osaki, 2022). According to the report from the National Examination Council of Tanzania (NECTA) in 2021, it was revealed that only 21% of students opted to sit for science subjects in their final examinations. This percentage is very low compared to students who chose subjects from other academic disciplines (MoEST, 2022). From this perspective, a pertinent question arises regarding the use of the provision of career guidance information in positively influencing students' choices of science subject combinations.

Tanzania's secondary schools' career guidance standards provide comprehensive support to students in making informed decisions about their education and careers. As outlined by the Tanzanian Institute of Education (TIE) in 2021, these standards encompass a wide array of critical components that are essential in

guiding students through their educational and career development. Subject exploration, career information, skill development, goal planning, personal assessment, decision-making techniques, counseling/mentoring services, and the promotion of transferrable abilities are all covered by the secondary school students' career guidance standards (TIE, 2021). There are persistent worries regarding the effectiveness of individual career workshops and seminars in influencing students' interests in pursuing science subject combinations, despite the emphasis on educational standards intended to provide students with the knowledge and skills necessary for success in their studies and careers (Zhang et al., 2023).

School administrators in Karagwe district are expressing growing concerns about the limited provision of individual career guidance services when students are choosing science subject combinations. The number of students choosing science courses has clearly decreased, according to Magesa (2022), going from 24% in 2018 to 19% in 2022. The primary indicator is that more of these students perform better in arts courses than in science courses. This finding emphasizes how crucial it is to improve career counseling, particularly for form three students in secondary education, in order to help them select science courses that will best suit their chosen fields of study and future job goals. In light of this, the objective of this study was to investigate the practicability of individual career guidance on public secondary school students' choices of science subjects in Karagwe District, Tanzania.

Statement of the Problem

Notwithstanding increased educational access for the majority of Tanzanian students, the degree of contradiction of students' selections of science subjects in public secondary schools is disturbing and increasing worse. This problem is very serious since it frequently makes students feel unmotivated, distracted, and unable to perform well in their chosen fields of study while the Tanzanian government ensured that each school has a teacher counselor (Mgaiwa, 2021; URT, 2015). Doubts have been raised by parents and other education stakeholders regarding the quality and adequacy of teacher counselors in public secondary schools and their capability to influence students' subject choices. The research carried out by Magesa (2022), Tibategeza (2022), and Mwanza and Masanja (2022) investigated several facets of career counseling services and their impacts on Tanzanian secondary school students. These studies, however, did not go into great detail about how career counseling services affected students' selection of science subjects. In an attempt to close this research gap, the current study looked into the precise function that career counseling services play in helping secondary school students in Karagwe District choose their scientific subjects.

Research Question

The study was guided by the question; How does individual career guidance enhance the choice of science subjects among secondary school students in Karagwe District?

Significance of the Study

The study provide knowledge and information that can empower students to make more informed choices, enhance their engagement and motivation in science subjects, and potentially improve their academic performance and future career prospects. The study findings inform teacher counsellors who play a crucial role in providing career guidance services to students. The findings can guide teacher counsellors in developing more targeted and effective strategies to support students in making science subject choices, thereby enhancing their effectiveness in delivering career guidance services. The study's findings can be significant for heads of schools as they oversee the overall functioning of educational institutions. The study's findings can be beneficial to education officers as they can inform career guidance services policy implementation and improvement in public secondary schools.

Theoretical Framework

The study was anchored in the Expectancy-Value Theory (EVT), which was originally developed in the 1960s by Atkinson and Shiffrin and further expanded by other researchers such as Eccles and Wigfield. The core premise of EVT is that individuals' decisions are influenced by two key factors: their beliefs about their ability to succeed in a particular field (expectancy), and the personal value they ascribe to that field. According to this theory, people are more inclined to select and pursue activities or careers that they perceive as both attainable and valuable to them. The EVT is widely used in education and career

development to understand how individuals make decisions about their academic and professional pursuits, and how to support them in achieving their goals.

The EVT provides a comprehensive framework for understanding the factors that influence students' choices of science subjects. It considers both their expectancies for success and the subjective values they associate with science subjects. The theory distinguishes the importance of contextual factors, such as societal, cultural, and environmental influences, in shaping students' motivation and decision-making. While the theory assumes a rational decision-making process, in reality, students' choices are impacted by cognitive biases, social pressures, and limited information. The theory's static framework does not fully capture the dynamic nature of motivation and decision-making over time. In the context of public secondary schools in Karagwe District, Tanzania, the EVT can inform career guidance services. By assessing students' expectancies and values, professionals to identify barriers, build confidence, and highlight the relevance of science subjects to students' interests and aspirations.

Literature Review

Ali and Ullah, (2021) conducted a study on the role of teachers in the career guidance of students at secondary level in Pakistan, the study employed a quantitative research design with a descriptive-exploratory approach. The target population comprised 3,247 high school students from the Swat district, with a sample of 346 students selected through simple random sampling. Data collection was conducted using a self-made questionnaire. The collected data was analyzed using mean ratings, standard deviation, and the chi-square test. The study discovered that teachers play an important role in secondary school career guidance because they serve as role models for students, identify students' career aspirations and abilities, assist in the integration of students' aspirations and potentials, assist in subject selection, provide career guidance, identify potential careers, and provide career information and requirements. The study suggested that teachers' capacity for providing career guidance at the secondary level be developed and the inclusion of career guidance subjects at the secondary level.

Uche (2020) carried out a study about the influence of career guidance on students' career choices in secondary schools: implication for career guidance in Nigeria. A descriptive survey design was used for the study for the population of 2940 individuals. Simple random techniques were used to select 588 students. The findings of this study revealed that individual career counselling services have an influence on students' compliance with rules and regulations, school social environment, motivation to learn, and adaptation to the physical school environment. However, the study did not explore the potential influence of contextual factors, such as socioeconomic status, family background, or school resources, on the relationship between career guidance and student outcomes. Therefore, the current study included students, career guidance teachers, and heads of schools to get more comprehensive information about the students' choices of science subjects.

Otwine et al. (2022) conducted a study about the efficacy of individual career guidance and counselling among secondary school students in Uganda. A cross-sectional survey was conducted using mixed methods in secondary schools in South Western Uganda. A total of 161 students in the final year of secondary education (senior six) and 35 teachers across four schools met the inclusion criteria and consented to participate in the study. Standardized questionnaires as primary tools of data collection were used. The study found that implementation of individual career guidance and counselling in schools was demonstrated by the type of programs, information sources, models, timing, and information structure by class level. The study included both students and teachers as participants but did not explore the perspectives of other stakeholders, such as school administrators, career guidance counselors, or parents. To address this limitation, the current study explored the views of other stakeholders including teachers, students, and heads of schools on individual career guidance to enhance the choice of science subjects.

Ngussa and Charles (2019) conducted a study about the perception of students regarding the role of teachers and parents in career choice preparedness: A case of secondary schools in Meru district, Tanzania. The study employed a survey research design. Through systematic and purposive sampling, the sample of 406 students from 10 schools filled out the questionnaire. Parents and teachers are perceived by students to have played their role very well in their desired career choice. There is no significant difference in career choice preparedness by students characterized according to sex and location. Yet there is a significant positive relationship between parents' and teachers' involvement in career choice guidance and students' career choice preparedness. However, the previous study findings primarily addressed career choice preparedness,

making it challenging to evaluate the specific impact of individual career counseling on students' choice of science subjects. To provide a more comprehensive assessment, the current study shifted its focus to the perspectives of teachers and parents regarding students' career choice preparedness.

Alloph and Tibategeza (2022) conducted a study about the contribution of individual career guidance services on individual students towards professional training: A case of Magu district, Mwanza. The study employed a convergent parallel research design under a mixed research approach which helps in data collection, and analysis of data. The sample size was 152 participants, simple random sampling was used to select secondary school teachers and form four students, while purposive sampling was used to select public secondary school leavers in 2020 and heads of secondary schools. Quantitative data were collected through questionnaires. Qualitative data were collected through interviews and analyzed thematically by creating themes. The qualitative data were analyzed thematically by creating themes. The study revealed that individual career guidance services that were provided in public secondary schools were ineffective; hence, making secondary school leavers join unplanned professional training since it did not contribute to the students' choices of future professional training. In order to uncover the realities underlying students' career choices and, in particular, their pursuit of science subjects, the current study undertook a thematic analysis by developing issues in accordance with predetermined procedures in the thematic analysis process.

Maree and Magere (2023) conducted a study about the influence of group career construction counselling on Tanzanian public secondary school students' career decision-making difficulties. Convenience and purposive sampling were used to select 35 public secondary school participants from a single public school in Tanzania. A qualitative approach was employed and an intrinsic single-case, descriptive, intervention career design was implemented. An eight-week career construction counselling intervention was executed. The data were generated using an interview guide. Thematic data analysis was employed to analyze the data. The results showed that the intervention improved the majority of participants' ability to make well-informed job decisions, strengthened their psychological self, and increased their career adaptability. The study focused on the participants' overall ability to make career decisions and their ability to adjust to new opportunities, rather than specifically examining how this affected their choice of science subjects. The study's conclusions shed important light on how group career construction counseling affects students' challenges in making career decisions, but it overlooked how individual career counseling influences students' choice of scientific subjects. The current study examined how individual career counseling services affected students' choice of scientific courses in an effort to close the gap.

In summary, the reviewed studies, including Uche (2020), Otwine et al. (2022), Ngussa and Charles (2019), Alloph and Tibategeza (2022), and Maree and Magere (2023), explored various aspects of career guidance and their impact on students' career choices, efficacy, perception, and professional training. The study employed qualitative or quantitative research approaches and did not specifically investigate the influence of individual career counseling on students' selection of science subjects. Therefore, the current study addressed this research gap by examining the practicability of individual career guidance in public secondary school students' choices of science subjects in the Karagwe District of Tanzania. To achieve this, the study adopted a mixed methods approach, combining qualitative and quantitative research techniques to provide a comprehensive understanding of the topic. By employing this approach, the study sought to contribute valuable insights to the existing literature on the effectiveness of individual career counseling in guiding students' decisions regarding science subjects, thereby enhancing the practicality and applicability of career guidance services in the Tanzanian context.

Additionally, the study conducted by Alloph and Tibategeza (2022) revealed the ineffectiveness of career guidance in secondary schools, while Magere (2023) emphasized the need to improve students' career decision-making capacity, leaving a gap in understanding the role of individual career counseling in science subject choices. Marcus (2022) provided insights into the state of career guidance programs in public secondary schools but did not dig deeply into the specific effects of career guidance seminars on science subjects. Another author discussed the influence of career information and resources on science subject choices, with Chukwu et al. (2022) analyzed factors affecting career choices among students in Aba North but did not specifically address the role of career information and resources in science subject selection. Modiba and Sefotho (2019) identified the training needs of life orientation teachers, and Angelista (2018) examined the challenges faced by teachers in implementing career guidance without focusing on solutions. However, it was noteworthy that none of the studies reviewed specifically investigated the impact of career guidance services on students' choices of science subjects. Moreover, the reviewed studies predominantly

utilized either qualitative or quantitative research designs, posing potential limitations in terms of integrating both perspectives and numerical data to draw comprehensive conclusions. Therefore, the current study investigated the contribution of individual career guidance on students' choices of science subjects in public secondary schools within the Karagwe district of Tanzania by employing mixed research methods.

Methodology

This study employed a convergent design within a mixed research methods approach that allowed the researcher to converge the quantitative and qualitative data during the analysis phase, facilitating a deeper exploration and interpretation of the research questions (Creswell, 2018). The study involved 31 public secondary schools located in Karagwe District, along with 31 public secondary school heads, 1,225 form three students, 31 teacher counselors, and 1 District Secondary Education Officer (DSEO), making a total population of 1,288. Consistent with 10% to 30% sample by Cohen et al. (2018), the study utilized a sample size of 141(10.9%) respondents. The sample included 120 form three students, 10 teacher counselors, 10 heads of schools from 10 public secondary schools, and 1 DSEO who were obtained through simple random sampling, purposive sampling, and stratified random sampling techniques.

Data were collected using questionnaires, interview guides, and interview schedules. Data collection instruments were validated by educational research experts from MWECAU. A pilot study was conducted in two public secondary schools. The reliability of questionnaire for students based on the Likert-type items was estimated using Cronbach Alpha technique and a coefficient of 0.894 was obtained while reliability for qualitative data was established through peer debriefing and triangulation methods. The study adhered to research ethical principles throughout the research process. Quantitative data were analyzed using descriptive statistics into frequencies, percentages, and mean with the assistance of SPSS version 22 and presented in tabular form. Qualitative data was analyzed thematically in six steps whereby data were organized and prepared for analysis, read or looked at, coded then description and themes were generated, interrelated, and lastly interpretation was done(Creswell & Creswell, 2018).

Results

This study aimed to investigate how individual career guidance enhances the choice of science subjects among secondary school students in Karagwe District. To answer the research question questionnaires were provided to students which required them to indicate the level of agreement and disagreement with given statements. The interview schedule was used to solicit information from heads of schools while interview guides were used to obtain information from teacher counselors and District Secondary Education Officers (DSEO). The questionnaire for the students provided vital information that was summarized in percentages and means. The percentage were interpreted with the insight of Taherdoost (2019) and the means according to Chyung and Hutchinson (2023). Table 1 summarizes the responses of the students about the research question.

Table 1: Students Responses About the Individual Career Guidance to Enhance the Choice of Science Subjects (n=120)

		SD		D		U		A		SA		Mean
s/n	**Statements**	**f**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
I	Teacher counselors conduct one-on-one career counseling sessions to understand students' interests and aspirations in science subjects.	1	0.8	2	1.7	11	9.2	50	41.7	56	46.7	**4.3**
Ii	Individualized career guidance encourages students to explore various science career options.	9	7.6	10	8.4	9	7.6	41	34.5	50	42.0	**3.9**
iii	Students receive personalized advice on the best science subjects that align with their goals.	3	2.5	8	6.7	10	8.4	47	39.5	51	42.9	**4.1**
iv	Career guidance provides a clear roadmap for students to pursue a science-related career.	3	2.6	11	9.5	12	10.3	47	40.5	43	37.1	**4.0**
V	Providing personalized guidance tailored to students' unique career goals and interests in science.	4	3.4	14	12.1	10	8.6	37	31.9	51	44.0	**4.0**

vi	Individual career guidance fosters a sense of direction and purpose among secondary school students.	11	9.7	8	7.1	15	13.3	35	31.0	44	38.9	**3.8**
vii	Students are more motivated and inspired to excel in science subjects through personalized guidance.	7	6.0	11	9.5	14	12.1	34	29.3	50	43.1	**3.9**
viii	Handmade career guidance helps students recognize the relevance and potential career paths associated with science subjects	5	4.3	10	8.5	10	8.5	44	37.6	48	41.0	**4.0**
ix	Individualized career guidance equips students with essential skills for success in science fields.	2	1.7	13	10.9	7	5.9	30	25.2	67	56.3	**4.2**
X	Individual career guidance overcomes stereotypes and misconceptions about science subjects.	19	16.1	9	7.6	14	11.9	32	27.1	44	37.3	**3.6**
	Total mean score											**4.0**

Source: Field Data, (2024)

Key: *SD=Strong Disagree, D=Disagree, U=Undecided, A=Agree, SA=Strong Agree, F=frequencies, P=Percentages*

Data in Table 1 show that the very high majority (88.4%) of students agreed and strongly agreed that students one-on-one career counseling sessions were conducted by teacher counselors to understand students' interests and aspirations in science subjects while an extreme minority (2.5%) of students disagreed and strongly disagreed to the item while 9.2% of students remained undecided to the item. Students' mean score was 4.3. In terms of examining interests and aspirations in science disciplines, this suggests a strong support of the one-on-one career counseling sessions among students. The high agreement rate indicates that people are generally aware of the advantages and usefulness of tailored coaching when making decisions and exploring career options in science-related sectors. The results are consistent with a study conducted in Ghana by Amoah et al. (2020), which found that students who received one-on-one career counseling had clearer career goals and were more confident about pursuing careers in science. The implementation of one-on-one counseling facilitates a deeper exploration and understanding of students' interests, strengths, and aspirations within the realm of science. The findings are supported by the arguments of teacher counselor "9" who through face-to-face interviews shared the views that;

> One-on-one sessions provide a personalized approach to career exploration, allowing us to understand each student's unique interests, strengths, and goals within the field of science. It's an opportunity for students to develop deeper into their passions and receive tailored guidance to help them navigate their academic and career pathways effectively (TC 9, personal communication, 26th March, 2024).

Also, the Teacher counselor "6" gave the view that;

> I believe that one-on-one counseling sessions offer a safe and supportive space for students to express their aspirations and concerns openly. By engaging in meaningful conversations, we can identify students' strengths and interests, address any challenges they may face, and provide targeted support to help them achieve their goals in science subjects (TC 6, personal communication, 18th March, 2024).

The information from the teacher counselors implies that one-on-one career counseling sessions provide an invaluable opportunity for personalized attention, exploration of passions, targeted guidance, and a safe space for students to express themselves. These sessions contribute to a better understanding of student's interests and aspirations in science subjects, ultimately assisting them in making informed decisions about their educational and career paths. The findings concur with what was reported in the study by Makwinya et al. (2022) in Tanzania who revealed that one-on-one career counseling allows counselors to adapt their approach to each student's specific interests, strengths, and goals, thereby enhancing the effectiveness of career exploration and decision-making processes.

Data in Table 1 show that a very high majority (79.5%) of students agreed and strongly agreed that students receive personalized advice on the best science subjects that align with their goals, extreme minority (9.2%) of students disagreed and strongly disagreed to the item while extremely minority (7.6%) of students remained undecided to the item. The data also show that a very high majority (75.9%) of students agreed and strongly agreed that providing personalized guidance tailored to students' unique career goals and

interests in science, extreme minority (15.5%) of students disagreed and strongly disagreed with the item while extremely 8.6% of students remained undecided to the item. The mean score for the statement was 4.1 for students. This implies that the students recognized the value of receiving personalized advice and guidance tailored to their career goals and interests in science subjects. The results were further corroborated by the information provided by teacher counselor "10" during face-to-face interviews who observed.

> Over the years, I've noticed that students genuinely appreciate and recognize the value of personalized advice and guidance. When they receive individualized attention, it shows them that their unique interests and aspirations in science subjects are being understood and taken seriously. They understand that tailored guidance can help them make informed decisions about their educational and career paths in science (TC 10, personal communication, 27th March, 2024).

Teacher counselor "2" shared:

> Students often express gratitude when they receive personalized advice and guidance. They appreciate the opportunity to explore their specific interests in science and receive guidance that aligns with their career goals. They recognize that tailored support can help them navigate the vast field of science and make choices that resonate with their passions (TC 2, personal communication, 7th March, 2024).

The information from the teacher counselors implies that students appreciate and recognize the value of personalized advice and guidance in science subjects. Personalized support enables them to make informed decisions, explore their interests, and navigate the field of science with confidence. These findings are in line with the Expectancy-Value Theory which maintains that individuals' motivation and engagement in academic tasks are influenced by their expectations of success (expectancy) and the perceived value or importance of the task. In the context of personalized advice and guidance in science subjects, students who receive tailored support are likely to have higher expectations of success, as they feel more equipped and confident in navigating the complexities of the field. Additionally, the perceived value of personalized support enhances students' motivation and engagement, as they recognize the relevance and applicability of their academic studies to their future goals and aspirations.

Data in Table 1 also show that the majority (69.9%) of students agreed and strongly agreed that individual career guidance fosters a sense of direction and purpose among students, extremely minority (15.8%) of students disagreed and strongly disagreed with the item while extremely minority (13.3%) of students remained undecided to the item. Data in Table 1 show that a very high majority (78.6%) of students agreed and strongly agreed that handmade career guidance helps students recognize the relevance and potential career paths associated with science subjects, extremely minority (12.9%) of students disagreed and strongly disagreed to the item and 5.9% of students remained undecided to the item. The mean score was 4.0 for students. This indicates that personalized guidance mechanisms are generally valued by students and contribute to their academic and career development in science. The findings were also supported by the argument by the teacher counselor who shared their views through face-to-face interviews. "*Personalized guidance mechanisms play an important role in empowering students to explore their interests, set meaningful goals, and navigate their academic and career pathways effectively within the field of science*" (TC 3, personal communication, 8th March, 2024).

Another teacher counselor had this to say:

> Personalized guidance mechanisms create a supportive environment where students feel empowered to explore their interests and receive targeted support to help them achieve their goals in science. Whether it's through mentorship programs or career exploration workshops, personalized guidance enhances students' motivation, engagement, and confidence in pursuing their academic and career aspirations in science subjects (TC 1, personal communication, 7th March, 2024).

Teacher counselors imply that personalized guidance mechanisms are crucial for empowering students in the field of science. This means that when students receive personalized support tailored to their interests, goals, and needs, they are more likely to succeed academically and pursue careers in science with confidence. These mechanisms create a supportive environment where students feel motivated to explore their interests and receive the necessary guidance to navigate their academic and career pathways effectively. These findings concur with those of the Kenyan study by Willy et al. (2023), which revealed that mentorship programs and career exploration workshops are highlighted as examples of personalized guidance mechanisms that enhance students' motivation, engagement, and confidence in pursuing their academic and career aspirations in science subjects.

Again, the data from Table 1 show that a very high majority (76.5%) of students agreed and strongly agreed that individualized career guidance encourages students to explore various science career options, extremely minority (16%) of students disagreed and strongly disagreed with the item while extremely minority (7.6%) of students were undecided to the item. Data show that a very high majority (82.4%) of students agreed and strongly agreed that career guidance provides a clear roadmap for students to pursue a science-related career, extremely minority (12.1%) of students disagreed and strongly disagreed with the item while 12% of students remained undecided to the item. The mean score was 4.0 for students. This indicates that the majority of students see individualized career guidance as instrumental in encouraging them to explore various science career options and providing a clear roadmap for pursuing a science-related career. The findings are in line with the study by Nyenga (2021) in Tanzania which revealed that personalized guidance mechanisms create a supportive environment where students feel empowered to explore their interests, receive targeted support, and make informed decisions about their academic and career pathways in science. Data in Table 1 show that the majority (64.4%) of students agreed and strongly agreed that individual career guidance overcomes stereotypes and misconceptions about science subjects, a minority (23.7%) of students disagreed and strongly disagreed with the item while an extreme minority (11.9%) of students remained undecided to the item. The mean score was 3.6 for students. This means that while most students perceive individual career guidance as valuable in overcoming stereotypes and misconceptions about science subjects, there is still some disagreement and uncertainty among students regarding its effectiveness in this area. This highlights the importance of ongoing efforts to promote diversity, equity, and inclusion in science education and the need for personalized guidance mechanisms to address the specific needs and concerns of students in challenging stereotypes and promoting a more inclusive environment in science. The findings concur with what was reported in the study by Tolbert (2020) in Tanzanian and Zimbabwe which revealed that personalized guidance mechanisms create a supportive environment where students from diverse backgrounds feel valued, empowered, and encouraged to pursue their interests in science. The researcher also asked heads of schools about ways of conducting individual career counseling sessions on students' choice of science subjects. The responses of the heads of schools are indicated in Table 2.

Table 2: Heads of Schools Responses about the Ways of Conducting Individual Career Counseling Sessions on Students Choice of Science Subjects (n=31)

S/N	Responses	F	%
1	Individualized discussion	9	30.0
2	Assess students' interests	5	16.7
3	Connect students with professionals in the science field	7	23.3
4	Students' reflection	6	20.0
5	Provide information on science career options	3	10.0

Source: Field Data, (2024)
Key: *F=frequencies, %=Percentages*

The data presented in Table 2 highlight the responses of heads of schools regarding various aspects of individual career counseling sessions for students' choice of science subjects. The data show that 30% of the heads of schools prioritize individualized discussions, indicating a commitment to tailoring the counseling approach to meet students' specific needs. Additionally, 16.7% of the heads of schools focus on assessing students' interests, recognizing the importance of understanding students' passions and preferences when guiding them toward suitable science subjects. Moreover, 23.3% of the heads of schools emphasize connecting students with professionals in the science field, providing valuable opportunities for students to gain insights and exposure to real-world applications of science. Furthermore, 20% of the heads of schools value students' reflection, encouraging them to engage in self-assessment and introspection to make informed decisions about their science subject choices. Last, 11.1% of the heads of schools emphasize providing information on science career options, ensuring that students have access to the necessary knowledge and resources to explore potential career pathways in the science field. The data imply that heads of schools observe a range of strategies and priorities teacher counsellors use in their career counseling sessions related to students' choice of science subjects. These approaches aimed at empowering students to make informed choices regarding their academic and career pursuits in science. Furthermore, when DSEO

was asked to provide his thoughts about how individual career counseling sessions contribute to fostering students' choice of science subjects, and said;

> Individual career counseling sessions play a crucial role in guiding students toward their choice of science subjects. These personalized sessions provide an opportunity for students to explore their interests, receive tailored guidance, and make informed decisions about their academic and career pathways in science. Through these sessions, students can gain a deeper understanding of the available science subjects, potential career options, and the skills required for success in the field (DSEO, personal communication, 13th March, 2024).

The information from the DSEO implies that individual career counseling sessions are highly influential in assisting students with their selection of science subjects. These individualized sessions offer students a chance to delve into their interests, receive customized advice, and make well-informed choices regarding their educational and career paths in the field of science. These findings reflect what was proposed by the study of Maree and Magere (2023) in Tanzania, which revealed that one-on-one counseling sessions provide students with the opportunity to explore their interests, strengths, and goals, thereby helping them make informed decisions about science subjects.

Generally, the study found that students recognize the value and importance of individual career counseling sessions in understanding their interests and aspirations in science subjects. The high agreement rate indicates a positive awareness of the benefits of personalized guidance in making informed decisions and exploring careers in science. Teacher counselors highlighted that personalized sessions provide tailored guidance, a safe space for expression, and a deeper understanding of students' interests and strengths. The study also revealed that students recognize the value of receiving personalized advice and guidance on science subjects, which helps them align their goals and receive tailored support. Personalized guidance fosters a sense of direction, recognizes career paths, and contributes to students' academic and career development. Mentorship programs and workshops were cited as effective mechanisms. Furthermore, individualized career guidance was seen as instrumental in encouraging students to explore various science career options and providing a clear roadmap for pursuing a science-related career. However, there were some disagreements and uncertainties among students regarding the effectiveness of personalized guidance in overcoming stereotypes and misconceptions about science subjects, emphasizing the ongoing need to promote diversity, equity, and inclusion in science education. Heads of schools also revealed various aspects of individual career counseling sessions for students' choice of science subjects. The DSEO's input further emphasizes the importance of individual career counseling sessions, disclosing their role in helping students explore their interests, receive personalized guidance, and gain a deeper understanding of science subjects and career options.

Conclusions

The researcher came to the conclusion that students are cognizant that individual career counseling sessions are offered in schools. In order to help students develop a more individualized career plan and increase their interest in and goals for science subjects, teacher counselors are vital instruments and key in the practice. These one-on-one counseling sessions have been helpful in giving some secondary school students a clear route to follow careers in science.

Recommendations

Given career counseling sessions at schools offer invaluable advice and support in the process of determining career decisions, it is important to encourage students to actively participate in these sessions. The study also recommend that teacher counselors should be prepared to recognize students who are having concerns about their future career pathways early on and offer them focused counseling and support. For the sake of providing efficient career counseling services, education administrators should endeavor to guarantee that every school employs a committed and qualified professional teacher counselor.

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