

RESEARCH ARTICLE

EFFECT OF STUDENT DISABILITY ONTHE ACADEMIC PERFORMANCE IN ELEMENTARY SCIENCE AND TECHNOLOGY IN PUBLIC PRIMARY SCHOOLS IN RWANDA A CASE OFGISAGARA DISTRICT

Ms. Niyomwungeri Noella¹ and Dr. Hesbon Opiyo Andala (PhD)²

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- 1. Department, Education, Mount Kenya University, Rwanda.
- 2. Department, Education, Mount Kigali University.

Manuscript Info

Abstract

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Key words:-

Student Disability, Academic Performance, Elementary Science and Technology, Public Primary Schools, Gisagara District **Background:** The research investigated the effect of student disability on academic performance in elementary science and technology in public primary schools in Rwanda, in the Gisagara district. Specifically, the research identified the student disability that affect the academic performance in elementary science and technology in public primary schools in Rwanda. Determined the level of academic performance among the disabled students in elementary science and technology in public primary schools in Rwanda and found out the relationship between the effect of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda. The population in this study consisted of 377 respondents, while their sample size was 194.

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Methods and Materials: To triangulate the data, primary sources were acquired utilizing questionnaires, interviews, and observation methods. To generate a sample population from the respondents, this study employed purposive, stratified, and simple random sampling methods. In data gathering and analysis, the study used both quantitative and qualitative methodologies in tandem. Content analysis aided qualitative data analysis, while quantitative data was presented using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (correlational and regression analysis) in IBM SPSS Version 21.0.

Results:For the first objective, results indicate that 86.1% strongly agreed that some students have a vision disability, 96.6% strongly agreed that some students are deaf or hard of hearing, 76.9% strongly agreed that some students have mental and bad health conditions, 69.4% strongly agreed that some students have an intellectual disability, and 83.8% strongly agreed that some students have a physical disability. For the second objective, 74.3% strongly agreed that understanding how to combine substances; 75.7% strongly agreed that the ability to conduct scientific experiments; and 68.9% strongly agreed that scientific innovation development among students indicates the level of academic performance among the disabled students in elementary science and technology. Results on the relationship between

the effect of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda. The study reveals a significant positive correlation between vision impairment, deafness, and higher national examination results in Rwandan public primary schools. Adjustments for vision impairment improve students' understanding of substance combinations and scientific innovation. Mental health conditions also correlate with higher national examination results. These findings suggest that they are correlated since most of their level of significance was greater than 0.05 in association with the academic performance in elementary science and technology in public primary schools in Rwanda.

Conclusion:It is recommended that the Rwandan government recommend providing resources and materials for disabled students, encouraging parents to be aware of their children, and providing training to teachers. They also suggest implementing systems for coordination, monitoring, enforcement, and restitution, inclusive curricula, teacher training, hiring more instructors with disabilities, reducing societal barriers, and increasing education funding. The researcher suggests they need to investigate the barriers to the implementation of the inclusion of learners with mild intellectual disabilities in regular primary schools in Rwanda.

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Introduction:-

Education is critical for everyone, regardless of age, gender, color, economic background, ability or Disability. People, particularly pupils with Disability, are commonly considered disadvantaged groups by cultures (Block, 2012). Students with learning Disability may have a variety of difficulties learning or executing academic tasks in the classroom. Attention deficiencies and poor self-management abilities may worsen these challenges. Students with learning difficulties are generally inattentive and easily distracted, according to research (Reid & Harris, 2013).

Globally, In accordance with the USA Census Bureau (2011), the world's total population is seven billion individuals. People with limitations in their bodies are among of the most disadvantaged communities in the entire globe, accounting for approximately fifteen percent of the population. Notwithstanding of any existing barriers, handicapped and Disabled children have the right to primary schools, intermediate school, and secondary school education. Since 1948, when the United Nations' Universal Covenant of Fundamental Freedoms was released, the standards that require everybody's kids to keep up with school still remain in effect. The United Nations Convention on the Rights of Persons with Disabilities, or which took effect in 2008 and was endorsed by the Parliament of the Kingdom of England in 2009, has 145 signatories, including all PSA nations except Afghanistan and Zimbabwe (DFID, 2012). The treaty highlighted that being disabled is a fundamental human right.

However, centres that serve pupils who have disabilities (SwDs) began just over three many years ago, even in advanced economies such as the United States of America, where 70% of them opened between 1975 and 1985 after implementing a law that addressed education for children (excluding the Hoary pioneer, 1948), Very inadequate foundation in any type of curriculum for guiding (Pfeiffer & Schein, 2001). At the time, neither rehabilitative nor programmes for rehabilitation considered properly equivalent to the required therapy for higher education SwDs.

According to DFID (2012), Article 24 of the International agreement on education demands states to take steps to guarantee that people who have disabilities are not excluded from the general system of learning, and that students who have impairments are not denied free and obligatory elementary or secondary academic achievement due to their physical or mental impairment. People who have impairments have equal access to inclusive, high-quality, complementing elementary, secondary, and higher education programmes as fellow citizens of their surrounding communities. However, this is achievable only if adequate adaptations for the person's requirements are made; individuals who possess disabilities obtain the assistance that individuals require within the framework of traditional schooling to promote their successful learning; and effective personalised assistance programmes are offered in surroundings that optimise academic and social growth.

According to Kabuta (2014), several countries have additionally implemented progressive legislation that ensures People with disabilities have the opportunity to receive higher education, notably undergraduate and graduate school, as well as other vital elements of life. For example, in the United States, the government as a whole has ensured services for participants with diseases by means of Public Law 93-112, Section 504 of the Rehabilitation Amendments Act of 1973, also known as the Americans with Disability Act (ADA, 1990), and the ADA American influences Act (2008). This also applicable to many other nations worldwide.

In many Sub-Saharan African countries, being handicapped greatly increases the possibility of attending school (UNESCO, 2010), while students who begin college have a greater likelihood of dropping out (Filmer, 2005). Additional schooling contributes to the dilemma. It has been suggested on the African continent that disabled students' entry to higher schooling or specialised courses may be officially forbidden (Karangwa, 2008) or openly discouraged. According to the UNDP, 80 percent of individuals with disabilities live in impoverished countries (UN, 2010).

Based to higher education statistics, a student from Sub-Saharan Africa's lowest socioeconomic quintile with a handicap has a 15% lower chance of enrolling in universities than someone belonging to the richest quintile (Brossard and Foko, 2017). This suggests that adversity and disability are particularly tightly associated in Sub-Saharan Africa, namely Tanzania. Disabled persons in Africa are some of the most economically disadvantaged of those without disabilities because they lack access to opportunities for learning. According to Tanzanian statistics, just 0.35% of elementary school children were disabled in 2011. In high school, 0.3 percent of males and 0.25% of girls have impairments. When compared to Tanzania's projected 7.8 percent disability population size, these proportions are exceedingly low, this indicates that the overwhelming majority of handicapped children have never been documented (UNESCO 2012). The low number of impaired students enrolled in primary and secondary schools predicts exceptionally low rates of student enrollment in Tanzania's higher education establishments. Regular attendance is sometimes challenging for children enrolled with impairments. This also affects the educational achievement of disabled kids.

The major barrier to higher education for those with physical impairments in Tanzania is a lack of accessible infrastructure. This consists of insufficient educational institutions, laboratories, libraries, restrooms, dining halls and rooms, as well as sports and recreational facilities. The lack of social and physical accessibility to post-secondary education for handicapped young people is an important obstacle to building a pool of adequately prepared students who can join higher college on an equal footing (Croft, 2010). This aspect of the schooling system in sub-Saharan Africa, together with a lack of accessible infrastructure, precludes a large proportion of handicapped students from pursuing higher education.

According to an article in Guardian The newspaper industry Weekly (30 August 2011), Rwanda's Ministry of Education (MINEDUC) projections that 10% of the country's young people are disabled, but the Education for All (EFA) Global Keepingtrack of Report 2010 suggests that the percentage of disabled children who attend school has the potential to be lower. According to the research, Rwanda's educational system is widely recognised as one of the most advanced in Africa when it comes of primary school participation. According to the 2012 Statistics on Education Yearbook, the "Net Number of Students Rate" increased from 94.2% in 2008 to 96.5% in 2012. The survey found that few children experiencing special needs training (SEN) attend local traditional schools. The vast majority attend specialised schools and centres in urban regions (Nsanzabiga, 2022). This study investigated the impact of student impairments on their academic achievement in key technology and scientific subjects in a publicly funded preschool programme in Rwanda. The main objective of this study was to investigate the effect of student disabilities on academic performance in elementary science and technology in public primary schools in Rwanda. It was guided by the following specific objectives:

i.To identify the student disabilities that affect the academic performance in elementary science and technology in public primary schools in Rwanda

ii. To determine the level of academic performance among the disabled students in elementary science and technology in public primary schools in Rwanda

iii. To find out the relationship between the effect of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda.

Theoretical Framework

Theory of Mind

Theory of Mind was coined by a US Psychologist David Premack (1978). Theory of Mind (ToM) is regarded as a complete body of information that can assist us in predicting people's conduct based on our preconceived notions. This capacity in children and teenagers is critical for mental growth, emotional and social mental processes, and improved communication skills. Some habits and abilities, including as deliberate interactions, healing broken communication, along and teaching, are related with TOM in how individuals act and relationships. According to Panksepp (2007), certain forms of play enhance brain socialisation, which aids in the development of interpersonal skills and competency. Emotional arousal, amusement, and enjoyment associated with ludic activity are of genetic nature and encourage the social brain (Panskepp, 2007), which is responsible for the learning of a set of mental capacities that allow individuals to identify and comprehend the mental and emotional state of others.

Dual Coding Theory

According to Pavio (1991), multimedia learning occurs when a person learns through both aural and visual inputs. He also agreed that three main sorts of interactions are required for quality, efficient education.

Communication between learners themselves with or without the presence of the teacher, Learners and teachers' communication and Learners content intellectually interacting with content that results in changes in learning, understanding, perception and cognitive structures. According to this theory relating to my topic a good communication between a teacher and a student must both auditory and sight while learners with visual impairment use only auditory this led to the challenge of slow movement of transmitting information between teacher and learners (Paivio,1991).

This means that it will take a long period of time to the teachers who teach visually impaired students to finish the curriculum program than their colleague teachers who teach sighted students of the same level (Paivio.A, 1991).

Conceptual Framework

What the researcher expects to learn from their investigation is shown in a conceptual framework. It lists the pertinent study variables and illustrates potential interactions between them (Swaen, 2015). This demonstrates how the independent, dependent, and intervening variables are related to one another. This demonstrates the influence of an independent variable on a dependent variable. It is depicted in the figure that follows.



Figure 2.1:- Conceptual Framework Source: Researcher (2024)

Figure 1 indicates the independent variable which consist the sort of Different Disability that affect students' academic performance and the dependent variable which is the academic performance and intervening variable that also can have the effect on both independent and dependent variables.

Research Methodology:-

Research Design

According to Azariah (2017), a map indicating the target population, research tools, and procedures may be utilized to create a study design. It refers to organisational elements and underlines that the study's purpose was to find solutions to the research problem. Simon (2016) had a similar viewpoint, noting that the study design reflects the general technique intended to be employed to elicit responses. In this regard, the study used a descriptive research design and included a modest number of participants who might be deemed research subjects. The descriptive study technique was utilized to collect data on personalities, attitudes, emotional concepts, and other educational difficulties (Wanjohi 2015). This study included qualitative as well as quantitative strategies, as well as a descriptive survey research methodology. First, a quantitative survey was carried out. Respondents obtained questionnaires during the course of the experiment.

Target Population

A research population is the group of people that the intervention seeks to study and draw conclusions from (Barnsbee, 2018). The population in this study consisted of 377 respondents from three sectors in Gisagara district: Musha, Ndora, and Mamba, and included disabled students' parents, teachers, and headteachers.

Sample Design

Sampling design is the approach you use to choose your sample. There are several sorts of sampling designs, all of which serve as guidelines for selecting your survey sample (kerlinger, 2019).

Sample Size Determination

Before identifying respondents for this study, it is vital to illustrate how the sample size is calculated. Taro Yamane (1967) developed the following mathematical approach for estimating sample size: Where n is the sample size, N is

the population size, and e is the marginal error or degree of confidence. General scientific formula: $\frac{N}{1+N(e)^2}$; and then the sample size is $n = \frac{377}{1+377(0.05)^2}$; $n = \frac{377}{1.9425} = 194.07$; then the sample

size is 194 Respondents

Participants. This means that the total sample population was 194 respondents: 15 headteachers, 74 parents, students, and 105 teachers.

Sectors	Population	Sample size
Disabled Students'	142	74
parents		
Headteachers	30	15
Teachers	205	105
Total	377	194
~ ~		

Targeted Population And Simple Size

Source: Primary data 2024

Sampling Technique

Okoye and Isaac (2015) define sampling procedures as the process of selecting an adequate number of elements from the overall population. The study used multiple sampling strategies. This study employed purposive selection approaches to choose head teachers and students, as well as simple random sampling to select instructors. The researcher employed these methodologies based on the experiences, characteristics, and expertise of all respondents to produce valuable information.

Data Collection Methods:-

Data collection is the deliberate process of gathering data or observations. Data collecting enables you to get personal information and unique insights into your study topic, whether you're conducting research for business, government, or academic objectives. This research collected data using several means, such as surveys, documents, or interviews. The research methodologies for data analysis are explained.

Data Collection Instruments

This study employed documentation, interviews, and structured questionnaires with both open-ended and closedended questions containing personal information and relevant questions for the study. These tools were recognised by scholars for their ability to yield high response rates at a low cost, with the additional capability of enabling the researcher to explain and answer questions from the respondents, according to Fraenkel&Wallen (2014).

Questionnaires

A set of written and printed questions with a choice of answers was devised for the purpose of our study. Researchers designed and presented them to students, teachers, and parents. This instrument included either written or oral questions and comprised an interview-style format. Depending on the availability or distance between a researcher and a respondent, the questionnaire was conducted by phone, on paper, or face-to-face (Barnsbee, 2018).

Interview

According to Michael (1987), interviewing is both an art and a science that requires talent, sensitivity, focus, interpersonal comprehension, insight, mental sharpness, and discipline. The list of questions to be asked during an interview has been prepared specifically for instructors in charge. It is designed to ensure that the same information is acquired from several persons by covering the exact same subject matter. Researchers employed the interview as the primary data gathering strategy, dealing with a variety of participants. The researchers prepared preset questions based on the study's aims and research topics. The researchers asked the inquiries, listed them, and recorded the replies from the people who responded. Additional pertinent questions might be asked. This was accomplished by concentrating and being attentive, and the researcher was able to wait for the respondents to complete replying.

There are various advantages to conducting interviews, including: The interviewer selects how to make the most of the interview's limited time.

Interviews make the process of interviewing various persons more methodical and detailed by restricting the topics to be covered. They are also excellent for holding group interviews and keeping the conversation focused. They are applicable to both illiterate and literate respondents, and they can be posed in their native language.

Documentation

This tool was used for data collecting, namely literature reviews and data analysis. It was utilised purposely to analyse the problem's historical context, how it is improving, and how it is today. This was done by reading textbooks, periodicals, institutional documents, material from the Internet, and data from chosen elementary and secondary schools.

Administration for Data Collection Instrument

It took one month to gather data from all respondents and participants. Prior to starting data collection, the researcher was introduced to head teachers, the district education officer, and other stakeholders in the field through a referral letter from Mount Kenya University. After obtaining permission, the researcher sits in a private room with groups of six to ten participants, focusing on the leader's style and the teacher's performance.

Research Findings and Discussions:-

Demographic Characteristics of Respondents

This research gathered data on gender profile, age group, education level, teaching experience in teaching primary schools located in Gisagara District, Rwanda.

Gender of Respondents

Respondent's gender profile was very important in investigating the effect of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda.

	Teachers		Disabled Students parents		Headteach	ers
	Ν	%	Ν	%	Ν	%
Male	53	50.4%	35	47.2	5	33.3
Female	52	49.1	39	52.8	10	77.1
Total	105	100.0	74	100.0	15	100.0

Table 4.1:- Gender Profile of Respondents.

Source: Primary Data (2024)

Information given in 4.1, 50.4% of teachers who participated in this study are male while 49.1% are female 47.2% of Disabled student's parents who participated in this study are male while 52.8% are female. In this regard, 33.3% of head teachers are male while only 77.1% are female. There is a gender balance but also female emancipation in primary schools, where more female students are now at primary schools attending classes. Malysia The International Policy Research Institute investigated the impact of student handicap on academic attainment in primary science and technology (Gilmour, 2020).

Presentation of Findings

The study examines data collected in line with the research goals and dependent variables. The research collected qualitative and quantitative data from 174 respondents, identify the student disabilities that affect the academic performance in elementary science and technology in public primary schools in Rwanda ,Determine the level of Academic performance among the disabled students in elementary science and technology in public primary schools in Rwanda and find out the relationship between the effect of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda.

TheStudent Disabilities that Affect the Academic Performance In Elementary Science And Technology In Public Primary Schools

The research identified the student disabilities that affect the academic performance in elementary science and technology in public primary schools in Rwanda. The following tables show how the participants respond to the following statements.

Statements	Stro Disa	ngly Igree	Dis	agree	Neu	tral	Agr	ee	Stro Agr	ongly ee		Mean	Std
	N	%	Ν	%	Ν	%	Ν	%	N	%	Ν		
Some students indicate vision	1	1.0	2	1.9	9	8.6	11	10.5	82	75.9	105	1.37	.800
Some students are deaf or hard of hearing	0	0.0	1	0.9	2	1.9	9	8.3	93	86.1	105	1.22	.635
Some student mental and bad health conditions	1	0.9	1	0.9	2	1.9	18	16.7	83	76.9	105	1.23	.643
The student who has an intellectual disability indicates a disability	0	0.0	2	1.9	14	13.0	14	13.0	75	69.4	105	1.48	.867
A physical disability of students indicates a student disability	1	1.0	2	1.9	3	2.8	11	10.5	88	83.8	105	1.35	.855

Table 2:- Teacher'sPerception On The Student Disabilities That Affect The Academic Performance In Elementary

 Science And Technology In Public Primary Schools In Rwanda.

Source: Primary Data (2024)

Results in Table 2 evidenced responses on Teachers's perception on the student disabilities that affect the academic performance in elementary science and technology in public primary schools in Gisagara District. Accordingly, 93(86.1 %) strongly agreed that Some students indicate vision, 86 (96.6 %) strongly agreed that Some students are

deaf or hard of hearing, 83(76.9 %) strongly agreed that Some student have mental and bad health conditions, 75(69.4 %) strongly agreed that some student have an intellectual disability indicates a disability, 88(83.8%) strongly agreed that A physical disability of students indicates a student disability. In general, the majority of teachers indicate that in Gisagara district they are vision, mental, intellectual, and physical disabilities students.(Lore, 2018)looks into the factors that influence the academic performance of students with special needs at medium level colleges in Machakos County. The study's goal is to better understand how these adolescents' academic achievement is influenced by their family history, attitudes, infrastructure, and instructional methodologies.

The findings indicate that family background, customised classrooms, and supplementary notes and handouts have a significant impact on the academic achievement of students with special needs. The report suggests enforcing regulations such as the Persons with Disabilities Amendment Bill and using online education as a flexible form of study to meet these specific educational demands. The findings can assist build a disability-friendly learning environment and boost confidence in students with special needs, resulting in increased enrollment and performance in higher education. Traditional teaching methods must be adapted to accommodate visually challenged pupils' visual, aural, and tactile capacities. Most blind students employ a variety of techniques, including readers, tape-recorded books, lectures, Braille materials, and raised line drawings. Talking calculators, speech time compressors, computer terminals, Braille printers, and paperless Braille machines are all now available because to technological advancements (Bhargava, 2018).

Table 3:- Parents Perception Towards The Student Disabilities That Affect The Academic Performance In

 Elementary Science And Technology In Public Primary Schools In Rwanda.

Statements	Strongly Disagree		Dis	Disagree		Neutral		Agree		Strongly Agree		Mean	Std
	N	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν		
A physical													
impairment in													
students	1	1.4	2	2.7	6	8.1	6	10.8	57	77.0	74	1.41	.858
demonstrates a disability													
Some students are													
deaf or hard of hearing	0	0.0	1	1.4	2	2.7	6	8.1	65	87.8	74	1.23	.653
Some student has													
mental health conditions	1	1.4	1	1.4	2	2.7	13	17.6	57	77.0	74	1.32	.724
The student who has													
an intellectual disability indicates a disability	0	0.0	2	2.7	10	13.5	11	14.9	51	68.9	74	1.54	.939

Source: Primary Data (2024)

Data presented in Table 4, 57 (77.0 %) parents strongly agreed that a physical impairment in students demonstrates a disability, 65 (87.8%) parents strongly agreed that Some students are deaf or hard of hearing, 57(77.0 %) parents strongly agreed that Some student has mental health conditions, 51(68.9 %) parents strongly agreed that the student who has an intellectual disability indicates a disability. Therefore, parents strongly believe that they are some of their students have physical impairment, deafness, mental and bad health conditions, and intellectual disabilities. the Research done by Santos (2019) investigates the impact of student success on students with disabilities in higher education, with an emphasis on registration with the campus disability office, accommodations, and institutional support services. It dispels the idea that students with impairments are uniform and seeks to promote understanding of their performance in higher education. The findings can assist administrators in tracking the effectiveness of accommodations, encouraging faculty participation, and emphasising the necessity of student registration with the university office of disabilities.

The level of Academic performance among the disabled students in elementary science and technology in public primary schools in Rwanda

This study evaluated the level of academic performance among the disabled students in elementary science and technology in public primary schools in Rwanda.

Table	4:-	Students	parents'	perception	on th	e level	of	Academic	performance	among	the	disabled	students	in
elemen	tary	science a	nd techno	ology in put	olic pri	mary s	cho	ols in Rwar	nda.					

Statements	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Mean	Std	
	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν		
Higher national examination results indicate the level of academic performance	1	1.3	2	2.7	6	8.1	10	13.5	55	74.3	74	1.43	.861
Understands how to combine substances	0	0.0	1	1.4	3	4.1	7	9.5	63	85.1	74	1.27	.688
Capable of conducting scientific experiments	1	1.4	1	1.4	3	4.1	13	17.6	56	75.7	74	1.35	.748
Scientific Innovation Development among Students	0	0.0	2	2.7	10	13.5	11	14.9	51	68.9	74	1.54	.939

Source: Primary Data (2024)

Information depicted in Table 4, 55 (74.3%) strongly agreed that Higher national examination results indicate their disabled student level of academic performance, 63 (85.1%) Strongly agreed that understands how to combine substances indicate the level of academic performance among the disabled students in elementary science and technology. Additionally, 56(75.7%) Strongly agreed that capable of conducting scientific experiments indicate the level of academic performance among the disabled students in elementary science and technology and 51(68.9%) Strongly agreed that scientific innovation development among students indicate the level of academic performance among the disabled students in elementary science and technology. According to Mphale (2021), the home environment influences a learner's mental and psychological abilities to succeed academically. This research looked at the Kwame Nkrumah National University of Science and Technology, or KNUST, Primary School in Kumasi to see whether factors in the home environment led to low academic achievement among Ghanaian primary pupils. Family environment affects include financial status, parenting style, and family size. We collected both qualitative and quantitative information from 120 students and 60 parents of the institution using surveys and telephone interviews, correspondingly. The study found that many students described their homes as unsuitable for studying, primarily due to their parents' socioeconomic position. Lack of parental participation has a negative impact on student academic performance.

Table 5:-	Teachers'Perception	on the Leve	l of academic	performance	among The	e Disabled	Students In	Elementary
Science A	and Technology In Pu	ublic Primary	Schools In Ry	vanda.				

Statements	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		y Mean		Std
	N	%	Ν	%	Ν	N %		%	N	%	Ν		
Higher national examination results in SET	1	1.0	2	1.9	8	7.6	16	15.2	78	74.3	105	1.40	.792
Understands how to combine substances	0	0.0	1	1.0	5	4.8	11	10.5	88	83.8	105	1.29	.689

<u> </u>													
Capable of conducting	5 1	1.0	1	1.0	5	18	17	16.2	81	77 1		1 32	700
scientific experiments	1	1.0	1	1.0	5	4.0	17	10.2	01	//.1	105	1.52	.700
Scientific innovation	l I												
and development	t 0	0.0	2	1.9	13	12.4	17	16.2	73	69.5	105	1.48	.856
among students													
C D' D	(000 1)												

Source: Primary Data (2024)

Results presented in Table 5, 74.3% Teachers strongly agreed that higher national examination results in SET indicate my level of performance, 83.8% strongly agreed that understands how to combine substances to indicate the students' performance in science and elementary technology additionally, 77.1% strongly agreed that capable of conducting scientific experiments to indicate the students' performance in science and elementary technology. 69.5% strongly agreed that scientific innovation and development among students indicate the students' performance in science and elementary technology. Students with disabilities are increasingly enrolling in higher education, but have consistently underperformed compared to their non-disabled peers. Students with impairments are expected to achieve academically on par with their non-disabled peers (Hartley & Keen, 2015). As a result, it is critical that institutions identify and support them (Kayhan, 2015). As graduation rates in higher education decline, administrators and teachers face increased pressure to address all students' requirements (Kayhan, Sen, &Akcamete, 2015). Higher education institutions are extending and reorganising support services to better serve students with special needs, including those with disabilities (Couzens et al. 2015).

The Relationship Between The Effect Of Student Disability On The Academic Performance In Elementary Science And Technology In Public Primary Schools In Rwanda

Table 6:- Correlation Between Student Disability And The Academic Performance In Elementary Science And

 Technology In Public Primary Schools In Rwanda.

		Vision	Deaf or hard	Mental ofhealth	Higher national examination	Understands how to combin	Scientific Innovation Development eamong
		Impairment	hearing	conditions	results	substances	Students
Vision	Pearson	1					
Impairment	Correlation						
	Sig. (1-tailed)						
	Ν	194					
Deaf o	rPearson	.704	1				
hard o	ofCorrelation						
hearing	Sig. (1-tailed)	.000					
	Ν	194	194				
Mental	Pearson	.488	.693	1			
health	Correlation						
conditions	Sig. (1-tailed)	.000	.000				
	Ν	194	194	194			
Higher	Pearson	.496	.716	.493	1		
national	Correlation						
examination	nSig. (1-tailed)	.000	.000	.000			
results	Ν	194	194	194	194		
Understand	Pearson	.803**	.601**	.446**	.414**	1	
s how to	oCorrelation						
combine	Sig. (1-tailed)	.000	.000	.000	.000		
substances	Ν	194	194	194	194	194	
Scientific	Pearson	.261**	.433**	.612**	.245**	.194**	1
Innovation	Correlation						
Developme	Sig. (1-tailed)	.000	.000	.000	.000	.000	
nt amon	gN	194	194	194	194	194	194
Students							
**. Correla	tion is significa	nt at 0.01				level	(2-tailed).
*Correlation	on is significant	at 0.05				level (2-tailed)	

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Source: Primary Data (2024)

Findings from Table 7 indicated A strong relationship was established between vision impairment and higher national examination results ($r=.496^{**}$, p-value=0.000), understands how to combine substances (.601^{**}, p-value=0.000), with scientific innovation development among students (.433**, p-value =0.000). The connection is positively connected since the p-value was less than 0.05, explaining that adjustment vision impairment affect Higher national examination results, understands how to combine substances and Vision impairment and vice versa.

For deaf or hard of hearing and higher national examination results $(r=.716^{**}, p-value=0.000)$, understands how to combine substances (.803^{**}, p-value=0.000), with Scientific Innovation development among students (.261^{**}, p-value =0.000). The association is positively related because the p-value was less than 0.05, explaining that adjustment deaf or hard of hearing affect higher national examination results, understands how to combine substances and vision impairment and vice versa.

There is a significant correlation found between mental health conditions and Higher national examination results ($r=.493^{**}$, p-value=0.000), understands how to combine substances (.612^{**}, p-value=0.000), having a high attractiveness rate (.261^{**}, p-value =0.000). Because the p-value was below 0.05, this means the connection is positive, demonstrating that modification mental health conditions effect Higher national examination results, understands how to combine substances and vision Impairment and vice versa. James (2019) examined the factors that influence the enrollment of learners with disabilities in inclusive primary schools in the Nandi South area. It concentrated on finances, physical facilities, instructional resources, teacher readiness, and curricular relevance. Data was collected from 44 principals and 306 classroom instructors. The report advocated for government funding, structured facilities, more qualified teachers, and a structured curriculum to suit the needs and aspirations of unique students. According to Kiat (2014), students should have easy access to rooms and interconnecting areas between buildings to ensure seamless movement. Kiat (2014). He suggests using non-slip materials and floor treatments to improve safety and mobility, as well as providing accessible parking and bathrooms for the disabled. Kiat (2014).

		Unstanda Coefficier	nrdized nts	Standardiz ed Coefficient s			95.0% Interval for B	Confidence
Μ	odel	В	Std. Error	Beta	Т	Sig.	Lower Bound	Upper Bound
1	(Constant)	.827	.134		6.163	.000	.562	69.5
	Vision Impairment	.016	.050	.564	316	.006	114	.083
	Deaf or hard of hearing	.942	.080	.732	11.816	.000	.785	1.099
	Mental health conditions							
		007	.051	.457	131	.001	106	.093

Table 8:- Regression Coefficients Between Independent Variable And Higher National Examination Results.

a Dependent Variable: Higher national examination results

b Predictors: (Constant), Mental health conditions, Vision Impairment, Deaf or hard of hearing

Source: Primary data (2024)

Findings in Table 9 from respondents of this study presented that, the regression equation is $(y = ax + b + \varepsilon)$ thus y: dependent variable as higher national examination results, x: independent variable as mental health conditions, vision Impairment, deaf or hard of hearing) thus $y = (Beta) x + .827 + \varepsilon$. Despite, there is 95 % confidence that the implementation of school feeding program can influence on higher national examination results, somewhere between 59.2% and 69.5%. The above table 4.5 shows that vision impairment were statistically significant to Higher national examination results (B=.564, p-value=.006), Deaf or hard of hearing were statistically significant higher national examination results (B=.732, p-value=.000) and mental health conditions is significant affecting higher national examination results (B=.457, p-value=.001). The result of regression analysis indicated that there are significant between independent variables with higher national examination results.

Μ	odel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confi for B	dence Interval
		В	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.791	.114		6.907	.000	.565	.887
	Vision Impairment	.791	.046	.752	17.302	.000	.701	.881
	Deaf or hard of hearing	.045	.073	.733	.623	.000	.698	.189
	Mental health conditions	.061	.046	.656	1.313	.000	.730	.152

 Table 10:- Regression Coefficients Between Independent Variable And Understands How To Combine Substances.

A Dependent Variable: Understands how to combine substances

B Predictors: (Constant), mental health conditions, vision impairment, deaf or hard of hearing

Source: Primary data (2024)

From Table 10 respondents of this study presented that, the regression equation is $(y = ax + b + \varepsilon)$ thus y: dependent variable as understands how to combine substances, x: independent variable as mental health conditions, vision impairment, deaf or hard of hearing) thus $y = (Beta) x + .791 + \varepsilon$. Despite, there is 95 % confidence that the implementing school feeding program can influence on understands how to combine substances, somewhere between 56.5% and 88.7%. The above table shows that vision impairment were statistically significant to understands how to combine substances (B=.752, p-value=.000), deaf or hard of hearing were statistically significant understands how to combine substances at (B=.733, p-value=.000) and mental health conditions is significant affecting understands how to combine substances (B=.656, p-value=.000). The result of regression analysis indicated that there are significant between independent variables with understands how to combine substances.

 Table 10:- Regression analyses between Independent Variable and Scientific Innovation Development among Students.

Model		Unstandardized		Standardized	t	Sig.	95.0% Confidence Interval for B	
		Coefficients		Coefficients				
		В	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.471	.097		4.859	.000	.554	.662
	Vision	116	.076	088	-1.531	.000	264	.033
	Impairment							
	Deaf or hard	.138	.120	.080	1.149	.001	098	.375
	of hearing							
	Mental health	.805	.076	.599	10.530	.000	.654	.955
	conditions							

a. Dependent Variable: Scientific innovation development among Students

b. Predictors: (Constant), Mental health conditions, vision impairment, deaf or hard of hearing

Source: Primary data (2024)

From Table 10 respondents of this study presented that, the regression equation is $(y = ax + b + \varepsilon)$ thus y: dependent variable as scientific innovation development among students, x: independent variable as mental health conditions, vision impairment, deaf or hard of hearing) thus $y = (Beta) x + .471 + \varepsilon$. Despite, there is 95 % confidence that the implementing school feeding program can influence on scientific innovation development among students, somewhere between 55.4% and 66.2%. The above table shows that vision impairment were statistically significant to scientific innovation development among students (B=-.088, p-value=.000), deaf or hard of hearing were statistically significant scientific innovation development among students at (B=-.080, p-value=.001) and mental health conditions is significant affecting scientific innovation development among students (B=-.080, p-value=.001) and mental health conditions is significant affecting scientific innovation development among students with scientific innovation development among students at (B=-.080, p-value=.001). The result of regression analysis indicated that there are significant between independent variables with scientific innovation development among students.

Conclusion:-

Reconsidering findings from this present research, it concludes: According to the first research objectives, the study reveals that some students have vision, deafness, mental health conditions, intellectual disabilities, and physical disabilities. Parents also strongly agree that physical impairments, deafness, mental health conditions, and intellectual disabilities indicate a student's disability. Overall, 86.1% and 83.8% of respondents believe these students have disabilities.

For the second objective, the researcher reveals that higher national examination results in SET, students' ability to combine substances, conduct scientific experiments, and develop scientific innovation and development indicate students' performance in science and elementary technology. However, a significant percentage of disabled students also believe that their academic performance is affected by their ability to combine substances and conduct scientific experiments.

Results from objective three reveal that the correlation and regression results established the existence of a positive correlation among the effects of student disability on the academic performance in elementary science and technology in public primary schools in Rwanda, where the Pearson's p-value and significance were justified by p-values less than 0.05, and the research results evidenced a positive correlation between student disability and the academic performance in elementary science and technology in public primary schools in Rwanda.

References:-

- 1. Anne H. Showers. (2017). Factors That Contribute to College Success for Students With Learning Disabilities. Learning Disability Quarterly Volume 40, Issue 2, May 2017, Pages 81-90.
- 2. Barnsbee, L. (2018). Target Population and Subgroups. ScienceDirect. Retrieved from https://www.sciencedirect.com/topics/engineering/target-population
- 3. Bhargava, D. (2018). Vision Impairment | Chapter 2: Definitions, Identification, and Professionals. Trinity University.
- Brigham, F. J. (2011). Science Education and Students with Learning Disabilities. Retrieved from onlinelibrary.wiley: https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1540-5826.2011.00343.x#accessDenialLayout
- 5. Emmanuel, M. (2019). Factors that Hinder Academic Performance of Learners with Visual impairments in two Selected Special Schools of Rwanda . Journal of Visual Impairment and Blindness,99(1): 15-25.
- 6. Gilmour, A. F. (2020). The association between teaching students with disabilities and teacher turnover. Journal of Educational Psychology, 112(5), 1042–1060.
- 7. Hagen, S. (2020). Shared decision making interventions for people with mental health conditions. Cocrane library .
- 8. Hayes, A. M. (2017). Cover of Disabilities Inclusive Education Systems and Policies Guide for Low- and Middle-Income Countries. Research Triangle Park (NC): RTI Press;.
- 9. Henning, M. A. (2016). Academic Achievement Performance of University Students with Disability: Exploring the Influence of Non-academic Factors. International Journal of Disability, Development and Education Volume 63, 2016 Issue 4.
- 10. James, B. J. (2019). Factors influencing enrolment of learners with disabilities in an inclusive education in primary schools in Nandi South District Kenya. American Journal of Occupational Therapy, 47, 132-140.
- 11. KABUTA, L. G. (2014). "Problems facing students with physical disabilities in higher learning institutions in Tanzania. Africa Scientific Reseach Journal.
- 12. Kajumbula, R. (2019). Enabling Success of Students with Disabilities on Teacher-training Distance Education programs in Uganda; A comparison of Two Dual Mode Universities. Student Support Services Department of Distance Education, Makerere University.
- 13. Khan, M. (2022). Facts behind the poor academic performance of students in school. linkedin. Retrieved from https://www.linkedin.com/pulse/facts-behind-poor-academic-performance-students-school-mahrukh-khan/
- 14. Kushalnagar, R. (2022). Deafness and Hearing Loss. European Scientific Journal of Research .
- 15. Lombardi, A. R. (2020). Academic Performance of First-Generation College Students with Disabilities . Journal of College Student Development.
- 16. Lor, T. (2016). Factors impacting on school retention rates of lower secondary school female students in rural Cambodia and ways forward: A case study. Charles Darwin University.

- 17. Lore, M. M. (2018). Academic Performance of Students with Disabilities in Higher Education: Insights from a Study of One Catholic College. Journal of Family Psychology, 19 (2), 294-304.
- Marie, K. (2017). College Students with Disabilities: The Relationship between Student Characteristics, the Academic Environment, and Performance. Journal of Postsecondary Education and Disability, v30 n3 p209-221 Fall 2017.
- 19. Mberimana, E. (2019). Factors that Hinder Academic Performance of Learners with Visual impairments in two Selected Special Schools of Rwanda. Journal of Research in Special Educational Needs 11 (1): 12–19.
- 20. Mikropoulos, T. A. (2023). Digital technology supports science education for students with disabilities: A systematic review. Education and Information Technologies (2023) 28:3911–3935.
- 21. MINEDUC. (2015). The Republic of Rwanda's Policy on Science, Technology and Innovation. mineduc.gov.rw.
- 22. Mphale, L. M. (2021). Academic Achievement of Primary School Pupils: Investigating Home Environment Factors Contributing to Low Academic Performance. E-Journal of Humanities, Arts and Social Sciences (EHASS).
- Murungi, G. K. (2019). Influence of School Based Factors on Performance of Children With Disabilities in Kenya Certificate of Primary Education in Public Primary Schools in Igembe South District, Meru County Kenya. University of Nairobi Research Archive.

Nsanzabiga, E. (2022). Six years of inclusive education at the University of Rwanda-College of Education: Evaluation and perspectives. Rwandan Journal of Education - Volume 2 - Issue 1.

- Nuwagaba, E. L. (2019). Academic relationships and their influences on learning for students with a hearing disability: The case of Kyambogo University, Uganda. Journal of Vocational, Adult and Continuing Education and Training 2(1) 1/11/2019 DOI: 10.14426/jovacet.v2i1.35.
- 25. Rajpoot, P. L. (2019). Effect of Disability Awareness Program on a Regular School in Ujjain India: An Action Research. Texila International Journal of Public Health Volume 7, Issue 1, Mar 2019.
- 26. Rath, K. A. (2022). The Nature and Effectiveness of Learning Disability Services for College Students. Educational Psychology Review.
- 27. Santos1, S. B. (2019). Determining Academic Success in Students with Disabilities in Higher Education. International Journal of Higher Education Vol. 8, No. 2; 2019.
- 28. Sarkar, T. (2020). Examining Disability Inclusion In India's New National Education Policy. . Retrieved from Cambridge Network for Disability and Education Research (CaNDER): https://www.ukfiet.org/2020/examining-disability-inclusion-in-indias-new-national-education-policy/#:~:text=Disabled%20children%20rarely%20progress%20beyond,and%20genders%20are%20affected% 20disproportionately.
- 29. So, W. W. (2021). Engaging Students with Intellectual Disability in Science, Technology, Engineering, and Mathematics Learning. Science Education International 33(1), 25-37.
- 30. Vaishnav, P. (2019). Effect of Disability Awareness Program on a Regular School in UjjainIndia: An Action Research. Texila International Journal of Public Health volume 7, Issue 1, Mar 2019.
- 31. Vianney, H. J. (2022). Teaching and Learning Barriers in Inclusive Education for Physically Impaired Students and Their Academic Performance in Selected Secondary Schools in Rwanda a Case in Bugesera District. stratfordjournals.
- 32. WHO. (2023). Deafness and hearing loss. World Health Organisation.