

Performance of Learners with Hearing Impairment in Design and Technology Studies: A Case of an Inclusive Secondary School in Mumbwa Zambia

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ABSTRACT

This study was focused on ascertaining the performance of learners with hearing impairment in design and technology studies. The main objectives of the study were to: ascertain the performance and challenges of learners with hearing impairment in design and technology studies in an inclusive school. The study was conducted at an inclusive secondary school in Mumbwa district in Zambia.

This study was qualitative and used a case study design and data was collected using qualitative methods. Thus, the instruments for data collected included the unstructured interview guide, focus group discussions and document study. The sample size consisted of 20 participants who were six learners with hearing impairment, four Design and technology teachers, two sign language interpreters, head of department (HOD), administrators and six parents of learners with hearing impairment. The study discovered that most of the learners with hearing impairment performance were on average in design and technology studies. The average performance was attributed to theory component of the study which learners have performed poorly in the academic career pathway. The study also revealed that sign language interpreter should always be available in an inclusive class. The study found that resources for use during a practical lesson were not enough and hence had an impact on the performance of learners with hearing impairment in design and technology studies. Communication between teachers and learners with hearing impairment was another challenge, which was revealed in the study. Learners with hearing impairment were subjected sometimes to learn in class without a sign language interpreter, which was against the inclusive education policy of not leaving anyone behind. However, the study found that, design and technology studies has the capacity to prepare learners for developing skills for navigating life problems, future training and employment. Recommendations were that there is need to train more teachers with special education with a combination of design and technology studies as a teaching subject.

Key words: Performance, Learners, Hearing Impairment, Design and Technology Studies, Inclusive Secondary School, Sign Language Interpreter, Communication, Inclusive education.

INTRODUCTION

Learners with hearing impairment have not been performing well academically such as in the area of Design and Technology Studies. [18] stated that children with hearing impairment in Zambia have not been performing too well academically. The researcher further noted that academic performance of learners with hearing impairment has continued to decline far below their hearing counterparts. Since the introduction of special education in Zambia, most learners with special education needs have been learning in special units while a few are found in inclusive school settings. However, most teachers in inclusive schools are not aware of how best to help learners with hearing impairment, mainly because they lack skills and techniques to handle these learners especially those not trained in the field of special education.

Since the introduction of special education in Zambia, most learners with special education needs have been learning in special units while a few are found in inclusive school settings. However, most teachers in inclusive schools are not aware of how best to help learners with hearing impairment, mainly because they lack skills and

techniques to handle these learners especially those not trained in the field of special education. As reflected in examination reports, the academic performance of learners with hearing impairment keeps on deteriorating year after year as enunciated by [25].

Similarly, the researchers [25], acknowledge that some learners with special education needs are in special schools. The researchers further stated that, in 2007 Chileshe Chepela Special School in Kasama Northern Province accommodated pupils with deafness and hard of hearing from various parts of the country and offered them secondary education. Then in 2010, the school presented the first cohort to senior school certificate examination. However, since then, the performance of candidates with hearing impairment at this school has largely been poor. For instance, in 2013 and 2014 Chileshe Chepela Special Secondary School was ranked at 48.60 % and 36.36% respectively in terms of the number of candidates who obtained school certificates. Therefore, [25] argue that as a consequence majority of learners with hearing impairment end up in destitution after completing school. To abate destitution among learners with special educational needs there is need for practical subjects to equip them with sustainable skills through design and technology studies.

Furthermore, the teaching of design and technology as a vocational subject is important to all learners and especially to learners with special educational needs such as the hearing impaired. It helps the learners with hearing-impairment to acquire transferable skills that would make them to engage in personal enterprises, continue with education in tertiary institutions, and attain skills for gainful employment [23]. A good support is on record towards learners with hearing impairment at international level. For example, there has been academic support from parents towards learners with hearing impairment, this is revealed by [30] who conducted research in Israel. His findings were that parents got involved in the education of their children with hearing impairment, besides providing a supportive home environment. However, the study remained silent on the performance of learners with hearing impairment in relation to design and technology studies.

On the other hand, in Africa, there have been various supports towards learners with hearing impairment. For instance, [5], states that in the Western Cape of South Africa learners with hearing impairment are given support in form of counseling, healthcare, accommodation and career guidance. The author further revealed that learners with hearing impairment are often given service support even though the study did not focus on the performance of learners with hearing impairment in vocational career pathway such as design and technology studies.

In Zambia, learners with hearing impairment receive a variety of support from the government. For instance, [31] noted that, learners with special needs include learners with hearing impairment receive support from government in form of policy on formal education. They further state that the performance of learners with hearing impairment in design and technology studies is dismal and that few documented measures, if any, have been put in place by the government to enhance their performance. The government Zambia through the Ministry of Education in 2013 introduced two tier career pathways in the secondary school curriculum namely academic and vocational as indicated in the Zambia Education Curriculum Framework of 2013. The introduction of the academic and vocational career pathways provide career choices that prepare learners to enter the labour market and obtain academic credentials. A vocational career pathway consists of the following subjects: design and technology studies, Agricultural science, Art and Design, Computer Studies, Home Economics, Physical Education and Musical Education. Most schools do offer one or two study areas from the vocational pathway (Ministry of Education Science, Vocational and Early Education [17]).

Additionally, the interest in understanding how learners with hearing impairment could perform in design and technology studies was prompted by noticing the documented poor performance of the learners with hearing impairment academically through tests and final examination results. This prompted the researchers to pick on design and technology studies as one of the vocational career pathways that has integrated practical subjects such as woodworking, metal fabrication, system technology, building crafts, technical drawing and researched on the performance of learners with hearing impairment in design and technology studies in an inclusive school in Mumbwa district.

Statement of the Problem

According to [18], learners with hearing impairment in Zambia have not been performing too well academically. [15], observed that children with any thought of hearing loss if they don't receive proper diagnosis and early treatment, they may face difficulties in adjusting into mainstream schools. A number of studies have been conducted on the performance of learners with hearing impairment and suggestions on ways to help them improve on their academic performance. However, research on the performance of learners with hearing impairment in vocational career pathway such as Design and Technology has received less attention, if any, from researchers. To fill this gap, the current study focused on design and technology Studies as one of the components of the vocational career pathway with a view to ascertain the performance of learners with hearing impairment in this particular study area.

Objective of the study

1. To ascertain the performance and challenges of learners with hearing impairment in design and technology studies in an inclusive school.

Study Questions

1. How do learners with hearing impairment perform in design and technology studies in an inclusive school.
2. What challenges do learners with hearing impairment face in design and technology studies in an inclusive school.

Significance of the Study

The study was significant in that it ascertained the performance of learners with hearing impairment in design and technology studies. It promoted inclusion of learners with hearing impairment in vocational career pathways in inclusive school settings. This is because it would help special education teachers and regular teachers alike in giving guidance to learners with hearing impairment in making informed choices when choosing Design and Technology studies as their career pathway. Further, it is hoped that the findings of this study would help curriculum specialists in design and technology studies to develop a curriculum that caters for the needs of learners with hearing impairment. Besides, the study acts as a window to the Ministry of Education in general of the need to train more teachers in special education with a combination of design and technology studies as a teaching subject. This is because the essence of vocational career pathways, such as design and technology studies, provides sufficient practical skills to prepare learners with hearing impairment for subsequent training or early entry into a world of work. Finally, the finding of this study adds to the existing body of knowledge on the performance of learners with hearing impairment in design and technology studies.

LITERATURE REVIEW

This is a review of related literature on the performance of learners with hearing impairment in design and technology studies. The reviewed literature is in line with the objectives for this study, which are: to ascertain the performance of learners with hearing impairment in design and technology studies, to establish the challenges learners with hearing impairment in an inclusive face in design and technology studies, to establish how design and technology studies prepare learners with hearing impairment for future training and employment. The review takes into account the reviews from international, Africa and Zambian context.

[1] Started by defining vocational education as that which provides knowledge, skills, and work habits in relation to a specific profession, and enhances various aspects of one's ability. Vocational education and training were intended to equip learners with knowledge, skills and/or competences required for life and the job market. The researchers generally stated how the vocational career pathways prepare learners for future employment. They further indicated that vocational career pathways prepare learners for future employment but did not establish

how it prepares the learners with hearing impairment for future training in design and technology studies. This is what was addressed in this particular study.

Under performance of learners with hearing impairment in design and technology studies the review showed that mixed results have emerged from studies around the world on the performance of learners in technology studies according to [15]; [24]; [37] [11] [12]. Many face challenges in learning design and technology studies owing to policy inadequacies, ineffective implementation and lack of resources as alluded by [35].

In terms of design and technology studies and learner performance, [15] stated that design and technology has been taught in many countries around the world such as India, United States, Australia, New Zealand, Ireland, Malta, China, South Africa, France, England and Finland. In England however, it has been offered as a school subject at all levels of primary and many secondary schools. A study conducted by [15] on debates in design and technology found that design and technology studies has been taught as a school subject in some countries. However, little was mentioned on the performance of learners with hearing impairment in design and technology. Moreover, the study did not bring out the performance aspect of learners with hearing impairment in design and technology studies.

According to the [24] stated that South Africa has had no formal subject known as Technology Education in its schools until the introduction of the Curriculum in 2005. The changes in the National Education Policy Act and the implementation of Curriculum 2005 saw the introduction of Technology as school subject in schools. However, the document did not bring out the performance of learners with hearing impairment in design and technology studies, which this study focused on [8].

Concerning the challenges learners with hearing impairment face in design and technology studies in an inclusive school setting according to [36], who carried out a study on technology education for teachers, alluded that, most countries neither state a single rationale for technology education nor do they have one organizational approach. Each country builds on its history of technical education and develops an approach to suit the perceived needs of society and the individual. The researcher acknowledged that countries do not have a uniform approach for teaching design and technology studies. The researcher did not state, the challenges faced by learners with hearing impairment in learning design and technology studies. This study established challenges faced by learners with hearing impairment in design and technology studies in an inclusive school setting.

[21], who carried out a study on Special Education Teachers' Involvement in the 2013 Curriculum Development Process in Zambia discovered that, in Zambia the old curriculum was overloaded with none practical skills and emphasized theory, hence the revision and subsequent roll out in 2014 of a new curriculum, which had both the academic and vocational career pathways. Nevertheless, the researchers did not state challenges learners with special educational needs in this case learners with hearing impairment might face in the subject of design and technology studies one of the subjects in the vocational career pathways. The current research established the performance, challenges and how design and technology studies prepare learners for future training and employment.

According to the [16] and [20] life skills education led to development of individual's ability (attitude, values, knowledge, and skills to do life functions and fully participate in daily life.

Teaching and learning of Design and Technology studies has its own challenges. [38], observed that it has been a somewhat challenging journey from the outset, with calls for agreement on the purpose of teaching Design and Technology studies to learners. [38] further indicated that there are challenges in teaching Design and Technology studies to all learners in general. However, there is little or no data to show the challenges that learners with hearing impairment face. Similarly, there is little or no available information on the challenges that teachers who teach learners with hearing impairment face as pointed out in this current study.

Design and Technology studies often heavily rely on auditory cues for explanations, discussions, and instructions. As a result, learners with hearing impairment may struggle to fully grasp the content and engage in class activities. This challenge underscores the importance of fostering an inclusive environment that addresses the diverse needs of learners. This is in line with the study of [19]. They found that cultural influences on the

educational experiences of learners with hearing impairment in design and technology studies were affecting the performance of learners with hearing impairment in schools. However, the study did not bring out how cultural influence which affect the performance and is a challenge to learners with hearing impairment in learning design and technology studies.

Lack of necessary facilities and appropriate equipment has long been identified as challenges to effective teaching and learning of Design and Technology studies. [2] stated that, skills are not just acquired in vacuum; they are rather developed in a workshop or laboratory that is replete with the latest facilities and necessary materials. studies in mainstream classes, little is known about how design and technology studies equips learners with hearing impairment with skills for future training and employment.

[4] carried out a mixed method study that aimed at analyzing language practices in inclusive education classrooms in the Central province of Zambia that had learners with hearing impairment in schools. The study used two objectives namely: analyzing language strategies teachers used when teaching English in inclusive classes and to assess the nature of interaction between learners with hearing impairment and those without hearing impairment. However, [4] did not indicate the possible challenges learners with hearing impairment faced in subjects such as design and technology studies.

In the case of preparation for future training and employment, according to [6] in the Netherlands the underlying idea is that vocational education should enable learners acquire the competences needed in their future profession and in society as a whole. The researchers further pointed out that the gap between the labor market and education can be reduced through competence-based education. The study suggested vocational education should enable learners acquire competence needed for future professions. This is in accordance with Salamanca Statement by [34] which considers vocational preparation of learners with special needs as one of the priority areas.

The [3] reported that hearing impaired people continue to experience barriers to full economic participation for four reasons: (1) gaps in access to education and training, (2) inadequate funding for sign language interpreters, (3) the need to improve employers 'awareness of hearing impaired, and (4) problems with the availability of workplace. Therefore, a study to review the effectiveness of the implementation of career paths in technical and vocational programs, followed by the learners with hearing impairment is seen as a key tool in strengthening the application programs to produce individuals with special needs particularly learners with hearing impairment who are independent and competent, which also contributes to the talent to national development.

The study conducted by [32], on assessment of academic performance of learners with hearing impairment in selected five primary special schools in Kenya found that, the use of Kenya sign language to instruct learners with hearing impairment led to an improvement in their academic performance. The study by [32] did not indicate the performance and challenges learners with hearing impairment experience in vocational career pathway like in design and technology studies.

Research Gap

From literature reviewed with regard to the performance of learners with special educational needs in Design and Technology studies, learners learn to develop creative thinking in a range of areas that are relevant to design and technology. This way they are able to apply problem-solving skills to practical and technological problems. During the course, learners develop communication skills central to design making and evaluation, applying knowledge and understanding to the design and making of products, taking into consideration sustainability and the wider impact on society. Despite increasing awareness and efforts to promote inclusive education, there remains a significant dearth of comprehensive research addressing the nuanced challenges and factors influencing the academic performance of learners with hearing impairments specifically within the domain of design and technology studies. While there is a growing body of research on inclusive education for learners with disabilities, limited attention has been devoted to examining the unique intersections of hearing impairments and their impact on acquiring skills, knowledge, and practical competencies in design and technology-related subjects. Hence, the need for carrying out this study was prompted by the various gaps that exists in the area of learners with hearing impairment in design and technology studies.

METHODOLOGY

Research Paradigm

This study adopted a qualitative approach using an interpretivism research paradigm. The research paradigm chosen helped to interpret and generate a deep understanding on how learners with hearing impairment can perform in design and technology studies in an inclusive school. The advantage of using Interpretivism is that it tends to gain a deeper understanding of the phenomena and its' complexity in its unique context instead of trying to generalize the base of understanding for the whole population [10].

Research Design

The research design employed was a case study. Use of a case study in this particular instance was necessary because the study focused on a purposively selected inclusive school that offers design and technology studies to learners with hearing impairment. It enabled the researchers to discover in-depth understanding on the performance of learners with hearing impairment in design and technology studies. The essence of using case design can be justified because when a comprehensive, in-depth exploration of a specific phenomenon, context, or individual is carried out, it becomes essential and this study went through that route. Also, the use of this design, enabled the study to benefit from offering a contextual understanding of complex and unique cases. Thus, it enabled the researchers to study real-world situations in detail through meeting the participants. [29] states that, a major reason for the popularity and relevance of theory building from case studies is that it is one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research.

For instance, case studies are particularly valuable for theory development, holistic perspectives, longitudinal studies, and generating practical insights. As a result, by employing diverse data sources and accommodating multidisciplinary research, case study design provided a flexible approach that uncovered complex insights and contributed to both theoretical knowledge and real-world applications in this study. According to [27], a case can be centered on a phenomenon or a population. In the first scenario, cases are representative of a phenomenon, and are selected based on what can be empirically observed. The process highlights different aspects of cases and obscures others according to the research design, and allows for the complexity, specificity and context of the phenomenon to be explored. In the alternative, population-focused scenario, the selection of cases precedes the research.

Study Population

The target population for this study was for all learners with hearing impairment who were learning design and technology studies in inclusive school settings, Design and Technology studies teacher, HOD, sign language interpreters, administrators and parents to learners with hearing impairment.

Study Sample

The sample for this particular study comprised twenty (20) participants in total. They included six (6) learners with hearing impairment learning design and technology studies, four (4) design and technology studies teachers, two (2) sign language interpreters, one (1) HOD practical subjects, one (1) administrator and six (6) parents of learners with hearing impairment at the purposively selected inclusive secondary school in Mumbwa district. The twenty participants purposively selected for this study were strategically identified by the researchers because they met the criteria of representativeness for this particular study.

Research instruments

Un-structured interviews, focus group discussion and document analysis were used to collect data on performance of learners with hearing impairment in Design and Technology Studies. These methods were important for they made it possible to bring out in-depth information on the performance, challenges and how design and technology studies prepare learners with hearing impairment for future training and employment.

Un-Structured Interview Guide

Un-structured interviews were used to collect qualitative data from school administrators, design and technology teachers and parents regarding the performance of learners with hearing impairment in the subject. As argued by [36], the purpose of using this method of data collection was to reveal existing knowledge held by respondent in such a way that it can be expressed as answers to the interviewer's questions and can be interpreted.

Focus Group Discussion Guide

Focus group discussion guide was used to collect qualitative data from learners with hearing impairment learning design and technology studies. It was used because it allows for richness and flexibility in the collection of data. It also allows for extensive exploration of the research problem, which the researchers capitalizes on while resolving the difficulties it presents [10]. Since focus group comprises individuals who share common characteristics that are relevant to the study, it was important that information came from learners with hearing impairment learning design and technology studies who had the first-hand information on the performance, challenges and how the subject prepare learners for future training and employment.

Document Study

The document study was employed to analyze the performance of learners with hearing impairment through records of monthly and end of term test results. In order to analyze the performance of these learners there was need to review their past performance in Design and Technology studies. This enabled the researchers to triangulate data collected from interviews and data from focus group discussion requiring that data be examined and interpreted in order to elicit meaning, gain understanding and develop empirical knowledge. In this research, document study was used to obtain data from an inclusive secondary school under study in Mumbwa district. Document study was a systematic procedure for reviewing or evaluating both printed and electronic material. Hence, this enabled the researcher to obtain raw data as it was presented. The rationale for using document analysis is advanced by [9] who pointed out that documents have advantage over other techniques because they are as non-reactive and as such are not subject to a possible distortion as a result of the interaction between the researcher and the respondent like in interviews. Therefore, document analysis added on to the accuracy of data collected. The document analysis of the monthly and end of term test results provided greater insight to this study by supplementing data obtained through interviews and focus group discussions.

Ethical Consideration

Permission was sought from Nkrumah University Ethics committee and from an inclusive secondary school where the research was carried out. Further, participants in the study were informed about the nature and purpose of the study, and they were subjected to signing consent forms before interview. The reading out of the consent form was done to them as a way of making them understand the conditions and terms under which they were to participate in the study. In addition, participants were assured of high levels of confidentiality. The issue of anonymity was observed during data collection, analysis, and discussion by replacing their real names with pseudo- names. Data collected in form of voice recording were put on encrypted recording devices with a password only known by the researchers. Ethically the researchers named participants as follows; Design and technology teachers (DTT), Learner (L), Parents (P), Head of department (HOD), Sign language Interpreter (SI) and Administrator (A) respectively.

FINDINGS

1. Design and Technology studies and Learner performance

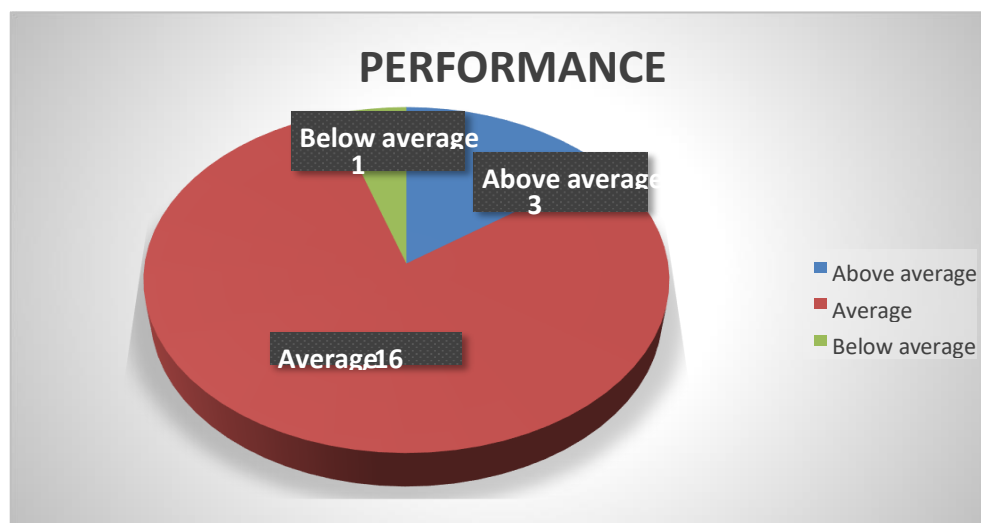
-Responses from the DDT, L, SI, P, HOD and A

The collected data is presented thematically according to objectives, namely: performance, challenges and preparation for future training and employment respectively.

Performance of Learners with Hearing Impairment in Design and Technology Studies

The findings are as presented by the pie chart Figure 1 below in accordance with objective one.

Figure 1: Views on Performance of Learners with Hearing Impairment in Design and Technology Studies



As shown in Figure 1, there was 16 participants out of 20 who indicated that their performance in design and technology studies was average, 3 said it was above average and only 1 indicated that it was below average.

Responses of Teachers on Performance of Learners in Design and Technology Studies. When teachers were asked how the performance of learners with hearing impairment in design and technology studies has been basing on the end of term tests, monthly tests and class exercise the following where the responses from the four (4) teachers of design and technology studies in Table 1:

Table 1: Responses of Teachers on Performance of Learners in Design and Technology Studies.

Respondents	Responses
DTT1	<i>“The performance for the grade nine learners with hearing impairment can be rated as being on average. I am currently handling two learners with hearing impairment, a girl and a boy. The girls’ performance is below average, while the male learners’ performance is slightly above average”.</i>
DTT2	<i>“The performance is on average, the learners with hearing impairment are good on the practical part but the theory part they have many challenges I think this has contributed to having average score during continuous assessments”.</i> This ultimately contributed to them having an average performance in design and technology studies.
DTT3	<i>“The performance of the grade twelve 12 learners with hearing impairment average. What has made them attain an average score is the practical part of the subject. Generally, results of the theory part are not good. However, when practical and theory results are merged they attain an average score.”</i> Further said that, <i>“For me I can say that when design and technology studies was first introduced to learners with hearing impairment in grade ten (10) in 2021 the performance was below average, but with consistence and few strategies the school has put in place, have helped the learners with hearing impairment as they progress in grades; their performance has slightly improved to average performance.”</i>

DTT4	<i>“The school has never recorded a learner with hearing impairment write the final examination council of Zambia (ECZ) assessment because the school introduced the subject to learners with hearing impairment in 2021 with the first cohort writing the final examinations in November/December of 2023. Hence the performance of the learners with hearing impairment in design and technology studies is based on the monthly and end of term tests the school has been administering to the learners.”</i> However, the participant, Further said that, <i>“The commitment and efforts we teachers have exhibited in a quest to help our learners has managed to help the learners with hearing impairment to have an average performance.”</i> Participant father said the effort and support the teachers put in to help the learners with special education needs learning design and technology studies has enabled them attain an average performance.
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The recorded verbatim transcript of data collected from the four teachers teaching design and technology studies revealed that out of the six (6) learners with hearing impairment learning design and technology studies performance of five (5) of the learners was average while the performance of one (1) of the learners was below average.

Responses of Learners on their performance in design and technology studies. When asked about their performance in design and technology studies during a focus group discussion, learners with hearing impairment responded through a sign language interpreter as follows in Table 2:

Table 2: Responses of Learners on their performance in design and technology studies

Respondents	Responses
L1	<i>“My performance in design and technology has been poor. There are few times I remember getting better marks. Generally, I am not doing fine. Though my desire is to perform even better if my challenges are addressed in our school.”</i>
L2	<i>“For me my performance is very good. I remember the first score when I just started learning design and technology studies in grade 8 term two, my performance was not good but, with the help we are receiving from the school I have improved in my grades. For example, now we have sign language interpreter and having extra lessons in the resources has helped me to improve in my grades.”</i> , <i>“My performance is fairly good; it’s only that I enjoy the practical part of the subject.”</i>
L3	from a grade eleven class, said that, <i>“My performance is fairly good despite the challenges am facing of being in an inclusive class. Maybe my performance could have been better if the class was only for us learners with hearing impairment.”</i>
L4	<i>“Well I would say my performance is not bad, maybe let me say its’ on average. The theory part of the subject has not been well with me because the terminology used, I do not personally understand it. Therefore, studying has been difficult and our friends and design and technology studies teachers do not know sign language.”</i>
L5	<i>“I would say that my performance is good and I have managed to always reach a passing score. Theory has been a challenge on my part.”</i>
L6	<i>“My performance is good but would like to perform even better.”</i>

As shown in Table 2: The participant, L1, acknowledged that her performance in design and technology was below average. L1 indicated being often attained marks that were below the passing score. Participant L2 stated that his performance was good in design and technology studies especially the practical part despite studying design and technology for the first time in grade 8 term two (2). Participant L3 stated that his performance in design and technology studies was also good although he did not perform too well in the theory part. The response from participant L3 indicates that, although this learner's performance in design and technology was average, the learner could have performed better had the learner not been learning in the mainstream. Participant, L4, explained that, his performance was on average and felt that it could improve if teachers teaching design and technology studies were trained in Sign language but lack of training for teachers in Sign language made learners to largely depend on Sign language interpreters. Participant L5 response indicates that, the performance was good and the only challenge is the theory component of the subject. L6 indicated that, his performance in design and technology studies was good. However, the performance can be improved if certain materials were put in place.

Responses of Head of Department Teacher on Performance of Learners in Design and Technology Studies. Responses from Head of Department (HOD) during semi-structured interviews when asked to rate the performance of learners with hearing impairment in design and technology studies were as follows in Figure 2;

Figure 2: Responses of Head of Department Teacher on Performance of Learners in Design and Technology Studies

"The performance of the learners with hearing impairment is on average. It is only a girl whose performance is below average she lacks interest in the subject. The contributing factor for average performance was that all teachers in the department have no special education qualifications but the school has teachers who are sign language interpreters who sign for our learners with hearing impairment."

The above presented verbatim from the purposively selected HOD in Figure 2: indicated that performance of learners with hearing impairment was on average although the performance of one female learner was below average due to lack of interest in the subject.

Responses of Sign Language Interpreters on Performance of Learners in Design and Technology Studies. When asked about the performance of learners with hearing impairment in design and technology studies the following were the responses in Figure 3.

Figure 3: Responses of Sign Language Interpreters on Performance of Learners in Design and Technology Studies

(SI): *"The performance is not very attractive in that they are on average. The boys are trying the only performance which is below average is of the only hearing-impaired girl learning design and technology studies who is currently in grade nine (9)."*

Furthermore, another SI interpreter said that, *"The performance of learners with hearing impairment in design and technology has been on average and from what I have noticed; they perform well in hands on activities. The theory component has been always a challenge to our learners."*

Responses from participants SI 1 and SI 2 in Figure 3: show that the performance of learners with hearing impairment in design and technology studies is on average and that learners perform well in the practical component of design and technology studies.

Responses of Administrators on Performance of Learners in Design and Technology Studies. When asked about the performance of learners with hearing impairment in design and technology studies see Figure 4

Figure 4: Responses of Administrator on Performance of Learners in Design and Technology Studies

"A" had this to say; *"Generally, the performance is not stable the range below and on average. Maybe it is because as a school it is the first time to introduce the subject to the learners with hearing impairment. Therefore, I can say we are in learning phase. Teachers in the department who handle learners with hearing impairment are always consulting special education teachers on how to ensure that they impart knowledge to our learner."*

From Figure 4: the expression of the participants, learner performance for the hearing impaired was on average. The participant allegedly said it because the school was offering design and technology for the first time to learners with hearing impairment.

Responses of Parents on Performance of Learners in Design and Technology Studies. Parents were asked about what they thought was the performance of their children in design and technology studies and the following were their responses in Table 3:

Table 3: Responses of Parents on Performance of Learners in Design and Technology Studies

Participant P1 had this to say, <i>"My child is not performing well in design and technology. I just remember there was a term she got a 40% score. All the time I collect the report books the scores are always below 40%."</i> Participant P2 said that; <i>"The boys' performance in design and technology studies is very good. He enjoys design and technology lessons, as I mostly see him doing projects and studying. She always reaches the passing mark whenever an assessment is administered."</i>	Participant, P4, had this to say in Chitonga language' <i>"Mebo mwanagu ngandamba kuti tandizyi kabotu kabotu ma marks njoajana muchieeyo cha technology. Ngandamba ati uli akatiakati. Aboobo uboneka kuti ulachiyanda cieeyo ecee kambo ula panga zintu zinji"</i>. When translating to English it means that 'As for me I don't really know the performance of my child in the subject technology studies. The performance I think it is on average. However, all I know is that my child likes the subject through the many things we have seen him makes."
Participant P3 narrated that, <i>"My child's performance is on average. Am impressed with his performance more especially that he is a 'chibulu"</i>. (The word chibulu in Ichibemba language is used to refer to an individual who does not hear or speak). Participant p6 narrated that, <i>"The performance is not good the Childs grades don't seem to progress each time I check on his progress."</i>	Participant P5, articulated that, <i>"My Childs performance is fair, at least registers an average score each time I get his end of term report book from the school. I think the subject is among the subjects he managers to get a passing score."</i>

As shown in Table 3: From the various responses given by the design and technology teachers teaching learners with hearing impairment, learners with hearing impairment learning design and technology studies, sign language interpreter, Head of department, administrator and parents shows that the performance of learners with hearing impairment is average and sometimes below average. Learners with hearing expressed knowing that their performance is fair and stated that they perform well on the practical part but have challenges with theory hence it has an effect on the overall mark. However, one vividly said her performance is poor. Sign Language interpreters also acknowledged the performance is not impressive due to limited vocabulary in sign language and so terminologies in design and technology studies which learners find it difficult to comprehend. The administration also indicated that the performance is on average and could because the current learners with hearing impairment are the first cohort to learn design and technology studies. The parents interviewed showed 16 learner's performance was on average, while 3 were above average while one learner's performance is below average.

Challenges Learners with Hearing Impairment face in learning Design and Technology Studies in an Inclusive School Setting. See Table 4

Table 4: Provides a summary of the findings on challenges learners with hearing impairment face in learning design and technology studies in an inclusive school setting

Participant	Responses
Participant L1	<i>"The challenge I face is not having sign language interpreters in some lessons. That puts us off because it will mean we will not benefit from that lesson and most of the times it goes without time been compensated which has also contributed to my poor performance."</i>
Participant L2	<i>"Our class is over crowded making it difficult to concentrate. There are many distractions in a class. I wish we had our own class".</i>
Participant L3	<i>"The other challenge is that it is time consuming and you spend time in the workshop and sometimes working on portfolios continues even at home. This makes me tired and it affects my work in other subjects."</i>
Participant L4	<i>"There are times when materials are not enough to use for the all class and as such, we are made to share the available resources, which in turn we do not benefit from hand on activities." The participant further echoed that, "since the number in our class is large, I do not get chance to play an active role in the learning process. For example, when the teacher is demonstrating he does it fast and as you know will depend on the interpreter, so when turn to see the demonstration you would have missed."</i>
Participant L5	<i>"Help rendered to us by teachers and our fellow learners in class is not enough. Sometimes I get frustrated"</i>
Participant L6	<i>"We have machinery and equipment but materials to use are a challenge. I enjoy the practical component of the subject. Sign language interpreters are not in enough sometimes we learn without an interpreter. We sometimes miss on the knowledge and skill we need to acquire."</i>

Among the challenges faced by learners learning design and technology were as follows; in some lessons sign language interpreters were not present. Material to use were not enough to cater for all learners in class to do hands on. Inclusive classes were overcrowded. Lessons were time consuming. It was not easy to observe what the teacher was demonstrating while seeing what the sign language was saying. Theory was difficult than practical. Teachers teaching them had no knowledge of sign language and learners wished learn direct from them. Therefore, these challenges affected learners with hearing impairment in their academic performance. See Table 5

Table 5: Provides a summary of the findings on challenges teachers face in teaching design and technology studies to learners with hearing impairment in an inclusive school setting

Participant	Responses
Participant DTT 1	<i>"I am not a design and technology studies teacher with no special education qualification. Therefore, for me to deliver my lesson I depend on Sign language interpreters".</i>
Participant DTT 2	<i>learners have challenges in technical drawings and getting the technical language which is due to language barriers</i>

Participant DTT 3	<i>“Not having resources makes us fail to sometimes have practical lessons, which are replaced by just explaining procedures to come up with an artifact”</i> . There is lack of access to technologic devices such as videos, projector for PowerPoint presentation
Participant DTT4	<i>“lack of materials to use for teaching practical’s most of the time is a challenge to the learners with hearing impairment. If materials can be availed timely maybe, our learner performance can be above average.”</i> Other challenge is over enrollment in an inclusive school which makes him sometimes not to render specific help to the learning needs of the learners. Apart from that, lack of availability of materials has been a challenge to demonstrate practical lesson and female learner having no interest in learning the subject.
Participant SI 2	<i>“At times they learn without an interpreter, which is unfortunate”</i>
Participant A 2	<i>“The school does not have enough sign language interpreters, which has been a challenge to cater for the individual need of our learners”</i>
Participant P	<i>“Meebo ndibona kuti ceeyo eci chiyandika chindi manigi. chindi chonse ubikila mano yonse kuceeyo chomwe”</i> (for me, this subject requires more time. The child concentrates on just on one subject).

As shown from Table 5; the challenges teachers face in teaching design and technology to learners with special education needs were such as not being trained in sign language but depend on interpreters and at times teaching without a sign language interpreter. Lack of interest by a female learner, lack of teaching and learning resources, lack of access to technologic devices such as videos, projector for PowerPoint presentation. It was also mentioned that, time allocated to the subject was not enough for an inclusive class having learners with hearing impairment and learners lack of concentration by learners in inclusive classes. See Table 6.

Table 6: Responses of Administrators and Parents concerning the challenges learners with hearing impairment face in learning design and technology studies in an inclusive school setting

HT 1 said that the department has no teacher with special education qualification. Teachers depend on sign language interpreters to deliver the lessons they are teaching to learners with hearing impairment in the mainstream class. We do not also have enough sign language interpreters I would say we just have one because the other one is not very competent and we have 6 learners who need their attention. HT 2 <i>“The other challenge not having teaching and learning material to use during hands on activities are a. Lessons which require material end being taught in abstract and hence a challenge to our learners more so learners with hearing impairment.”</i> P2 <i>“Time allocated for the subject is enough for the learners without impairment but not our learners with hearing impairment. Especially when working on a project for exams which we call portfolio. Learners with hearing impairment find it difficult because at times teachers find it difficult to find time to explain how to write the project, this poses a lot of challenge to learners”</i>	P1 said, <i>“I think the main challenge my child talk about is that the subject requires hard work because it enables one to spend most of the time in the workshop and she get tired easily. Sometimes it the subject for boys.”</i> P2 said, <i>“Providing necessary material to use is a challenge to me as a parent due to limited resources. Buying of instruments and work suit for my child is challenging.”</i> DH stated that, the school does not have enough sign language interpreters, which has been a challenge to cater for the individual need of our learners with hearing impairment learning design and technology studies. The participant further said, the practical department has received support through the government through grants and Non-Governmental Organizations. However, due to over enrollment the resources are limited to buy materials for use in every practical lesson.
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Findings on the preparations of learners with hearing impairment for future training and employment opportunities show that design and technology is one of the subjects in the vocational career pathway that empowers learners with survival skills such as in carpentry, bricklaying, systems technology, electrical, metal fabrication and entrepreneurship. Findings also show that learners develop critical thinking and innovation. It further enhances self-employment for them as they engage in productive and economically viable ventures as reflected from the following responses when asked how design and technology studies prepared learners for future training and employment see Table 7;

DISCUSSION OF THE FINDINGS

The discussion focused on performance of learners with hearing impairment in design and technology studies, challenges faced by learners with hearing impairment in design and technology studies.

This study was validated using the field theory by Pierre Bourdieu. Bourdieu [7] who emphasizes his view that reality is a social concept. One's existence is dependent on social existence that is, when one relates with others. The field theory further stated that in a classroom where a sign language interpreter can be assigned and combined with conventional methods, the deaf could absorb the lesson and relate with his classmates and teacher and perform well. The current findings showed that the performance on average resulted from social existence in that, there were many challenges learners with hearing impairment experienced in the social classroom environment such as instructional aspects of lacking enough sign language interpreters and adequate instructional resources, communication barriers between teachers and learners with hearing impairment as well as lack of understanding some words found in a subject, being taught by untrained teachers in design and technology and learning in larger classes which affected learners with hearing impairment in terms of concentration that affected the performance of learners in design and technology studies and resulted in having average results.

The voice of the researchers basing on the field theory was that the learners with hearing impairment truly found some difficulties in performing well when it came to design and technology studies during learning and teaching due to lack of social help.

The findings at the time of the study showed that performance was on average. This was attributed to the fact that learners performed well in the practical component compared to the theory. The study by [21] revealed that learners with hearing impairment were more interested in the vocational subjects and did not like the theory part of the subject. This was true because this study has shown that learners with hearing impairment did perform well practically and not theoretically. However, the other contributing factor was that there were many challenges they experienced while learning.

The researchers' voice was that learners with hearing impairment faced many challenges which hampered their performance and which need to be addressed to enable them learn effectively and perform better.

Studies show that use of sign language in schools for the learners with hearing impairment leads to improved academic performance. This is echoed by findings of [32] in a study on academic performance of learners with hearing impairment in five primary special schools in Kenya. [32] found that the use of Kenyan Sign language to instruct learners with hearing impairment led to an improvement in their academic performance. This is contrary to the current finding showing lack of sufficiently trained teachers in Sign language and over reliance on a few Sign language interpreters during design technology studies. At times learners would learn without Sign language interpreters thereby negatively affecting their ultimate performance.

The voice of the researchers was that, the need for sign language training for teachers and having enough sign language interpreters is of paramount importance and need to be practically addressed at this study school in order to boost the performance of learners with hearing impairment in design and technology studies.

There is need to advocate for the incorporation of varied modes of representation to cater to the diverse learning preferences and abilities of learners. This is because learners with hearing impairment exhibit a distinct preference for visual learning approaches such as visual cues, graphical representations, and interactive visual aids as indispensable tools for enhancing comprehension and engagement. For instance, this was lacking while learners were learning as amplified by Musata and Penda [22 P 188] who found that, “There was also less use of real objects as teaching aids and generally the use teaching and learning aids was limited”.

Furthermore, Appropriate inclusive teaching methods that facilitate learning of design and technology studies are needed because they play a pivotal role in shaping the experiences of learners. Inclusive teaching strategies are fundamental in ensuring equitable learning opportunities. Clear communication, visual demonstrations, and providing written instructions can aid in minimizing barriers and enhancing comprehension for learners with hearing impairment [28]. This was not similar to the current study finding which indicated that there were times when learners felt that some concepts in the subject put across had not been fully explained by sign language interpreters who were not trained in design and technology.

The voice of the researchers was that, this approach of using inclusive teaching methods and visual learning benefits learners with hearing impairment and contributes to a richer learning experience and good academic performance and is worth to be advocated for. Moreover, it helps educators to recognize and address the individual needs of their learners through accurate and effective communication that create an atmosphere where all learners feel valued and empowered to succeed.

The findings of the current study align partially with the principle of Universal Design for Learning (UDL), which emphasizes multiple means of representation to accommodate diverse learning styles and abilities [14]. This was partially because learners experienced a lot of challenges. Hence the need for advanced instructional technologies. However, while technology is celebrated for its potential to bridge gaps, it is important to acknowledge that there might be challenges in its implementation. Factors such as technological accessibility, compatibility, and the learning curve associated with new tools that can impact the effectiveness of adaptive technologies for learners with hearing impairment.

The researchers’ voice was that there is need to delve into strategies for optimizing the integration of technology to ensure seamless and beneficial experiences. If teaching of this subject had relied on adaptive technologies such as captioned videos, real-time transcription services, and visual note taking tools, using inclusive teaching strategies, providing written instructions, appropriate instructional technology and hands-on activities which foster a profound sense of agency and empowerment it could have significantly enhanced their understanding of complex design and technology concepts and overcome the challenges learners experienced.

Design and technology subject is important despite the challenges being experienced which affect their performance this is because it helps learners with hearing impairment to develop the skills of creativity and imagination [33, 26 and 7]. It can also help them navigate life problems [13].

CONCLUSION

The current study on the performance of learners with hearing impairment in design and technology studies has underscored the complex interplay between various factors that impact their educational journey. Findings reveal both challenges and opportunities that are integral to understanding the holistic experience of these learners within an inclusive school setting. On performance of learners with hearing impairment the study revealed that learners with hearing impairment performance in design and technology studies was average and below average. It further revealed that learners with hearing impairment faced multiple challenges when learning design and technology studies. These challenges range from lack of adaptive technologies, inadequate Sign language interpreters, lack of trained teachers in the use of Sign language as well as lack of instructional materials. Another challenge lies in communication. Communication barriers, whether in the form of missed auditory cues during lectures or the complexity of real-time interactions, emerge as central obstacles to effective learning. Collaborative activities and group discussions, integral to design and technology education, presented difficulties in participation and engagement. The absence of auditory feedback during practical activities and workshops

introduces a layer of complexity in their skill development. Furthermore, environmental factors, technological accessibility, and emotional well-being are also critical considerations that impact their performance.

The implications of this research are that the study was important despite the challenges being experienced, the skills obtained by learners with hearing impairment extend beyond the immediate educational context. The comprehensive skill set developed through design and technology studies equips learners with hearing impairment with the skills such as creativity and imagination for navigating life problems.

RECOMMENDATIONS

Based on the findings of the study on the performance of learners with hearing impairment in design and technology studies, it is recommended that:

1. There is need to train more teachers with special education with a combination of design and technology studies as a teaching subject.
2. The government should develop and enforce policies that prioritize accessibility in design and technology classrooms. This includes providing appropriate assistive technologies, ensuring compatibility with various communication methods, and optimizing classroom layouts for optimal visual and auditory experiences.
3. There is need to implement mandatory training programs for teachers that focus on inclusive teaching strategies and the effective use of adaptive technologies. This will equip teachers with the skills and knowledge needed to address the unique needs of learners with hearing impairment and create a more inclusive learning environment.
4. There is need to allocate resources to ensure that instructional materials, such as textbooks, visual aids, and online platforms, are designed with accessibility in mind. This includes providing captions for videos, alternative text for images, and content that caters to different learning preferences.
5. There is need to develop guidelines for collaborative projects that facilitate effective communication and teamwork among learners with diverse abilities. Encouraging clear communication methods, designated roles, and providing tools for remote collaboration can enhance the quality of group work for all learners.
6. There is need to encourage teachers to diversify assessment methods to accommodate various learning styles and abilities.
7. Policy makers can promote the use of alternative assessment formats, such as visual presentations or written reports, to ensure that learners with hearing impairment can demonstrate their understanding effectively.
8. There is need to establish opportunities for school based continuous professional development (SBCPD) for teachers that focus on the latest advancements in assistive technologies, accessible instructional practices, and strategies to create a more inclusive learning environment. This can be achieved through workshops, seminars, and online courses.
9. There is need to launch awareness campaigns to promote understanding and empathy among peers, teachers and the broader school community. These campaigns can help reduce stigma, foster a culture of inclusivity, and encourage learners with hearing impairment to advocate for their needs confidently.

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REFERENCES

1. Alkans C, Dogan H, and Sezgin S.I (2001). The Development of Vocational and Technical Secondary Education in Turkey. *Sakarya University Journal of Education* 9 (3), 614-627.
2. Ambimbola, A.O. (2007). Skills improvement Needs of Technical Teachers maintenance of woodwork equipment in secondary schools in Ogun state. M.ed Thesis University of Nigeria.
3. Australian Education Council, (1994), *Technology - A Curriculum Profile for Australian Schools*. Victoria: Australian Curriculum Corporation.
4. Banja, M. K., and Mandyata, J. (2018). Teachers' Situational Analysis of the Integration of Pupils with Disability in Selected Primary Schools in Zambia. *Multidisciplinary Journal of Language and Social Sciences Education*, 1(1)171-205.
5. Bell, D (2013). Investigating teaching and learning support for learners with hearing impairment at university. Mil Keys: Open University press
6. Biemans, H. (2004). Competence Based VET in the Netherlands: background and pitfalls. *Journal of Vocational Education and Training*, 56(4) Retrieved from <https://www.bveken.nl>
7. Bourdieu, P. (2013). *Outline of a Theory of Practice*. Cambridge University Press.
8. Brown, A. P., and Carter, T. S. (2020). Beyond Adaptation: Exploring Innovative Technological Solutions for Enhanced Accessibility in Design and Technology Education for Learners with Hearing Impairment. *Journal of Assistive Technology*, 14(4), 305-322.
9. Corbetta, P. (2003). *Social Research: Theory Methods and Techniques*. London: SAGE Publications Ltd.
10. Creswell J.W. (2013). *Qualitative Inquiry and Research Design*. Thousand Oaks, CA: SAGE.
11. Department of Education–South Africa (2005). *Curriculum adaptation guidelines of the revised national curriculum statement*. Pretoria: Government printers.
12. Examination Council of Zambia, (2014). *2014 Examinations Performance Report: General Performance Analysis*. Lusaka: Examination Council of Zambia.
13. Examination Council of Zambia, (2017). *In perspective Newsletter about the examination council of Zambia*. Issue No 10 January to June, Lusaka.
14. Fernandez, M. C., and Rodriguez, J. A. (2022). Fostering Inclusivity for Learners with Hearing Impairment in Diverse Cultural Settings: A Comparative Analysis of Design and Technology Curriculum Policies. *International Journal of Inclusive Education*, 37(1), 45-62.
15. Hall, T. (2012). *Universal design for learning in the classroom: Practical applications*. New York: Guilford Press.
16. Jackson, R. J., and Cooper, E. A. (2023). From Design Studio to Industry: Investigating the Transition Experiences and Career Trajectories of Graduates with Hearing Impairment in Design Disciplines. *International Journal of Career Development*, 40(3), 215-230.
17. [16] Ministry of Education and training in Vietnam (2006) *Educatiin for all in Vietnam : Higher enrolment, but problems of quality remain . An international study on childhood poverty*. 1(1) p 1-3.
18. Ministry of Education, Science, Vocational Training ,Early Education. (2013). *Zambia Education Curriculum Framework 2013*, Lusaka, Curriculum Development Centre.
19. Mayaka, T. (2015). *Implication of Hearing Loss on Academic Performance with Children with Hearing Loss*. Lusaka: University of Zambia.
20. Miyamoto, Y., and Park, S. (2019). Cultural Influences on the Educational Experiences of Learners with Hearing Impairment in Design and Technology Studies: A Comparative Study between Western and Asian Contexts. *International Journal of Multicultural Education*, 21(3), 234-251.
21. Muzata, K. K (2018). *Curriculum Implementation for Learners with Special Education Needs; the case of selected inclusive schools in Zambia*, PhD–Thesis. Pretoria: University of South Africa.
22. Muzata, K. K., Mahlo, D and Mabunda, P. (2019). Special Education Teachers' Involvement in the 2013 Curriculum Development Process in Zambia: A Case of Selected Inclusive and Special Schools. *Multidisciplinary Journal of Language and Social Sciences Education*, 2 (1) 216-250
23. Musata, K.K.and Penda, A, (2014). Pedagogical Experiences of Students on School Teaching Practice – A Study of Two Teacher Training Institutions on the Copper belt and Central Provinces of Zambia. *International Journal of Sciences: Basic and Applied Research (IJSBAR)* (14) (1), pp 187-204

23. Ministry of Education, Science and Vocational Training (MoESVT) (2012a) Education Sector National Implementation Framework III 2011–2015 (Final Draft).
24. National Department of Education (1996). National Education Policy Act no 27. Pretoria: Government Printers.
25. Ngandwe, W. and Phiri, E. (2017). A case study of Evelyn hone college. International journal of multidisciplinary research and development. 4(2) p127-142.
26. Owen-Jackson, G. (1956). Debates in design and technology education. London. Ashgs.
27. Ragin, C. C. (1992). Introduction: Cases of “what is a case? In H. S., Becker, & C. C. Ragin and (Eds). What is a case? Exploring the foundations of social inquiry, pp. 1–18.
28. Razalli, A., Rahim, T., Renate, O., Mamat, N, and Yusuf, N. (2018). Using Text with Pictures in Primary School to Improve Reading Comprehension for Hearing Impaired Students. Journal of ICSAR, 2(1):19-27.
29. Roseli, A., Takahashia, W, and Araujo, L. (2020). Case study research. Opening up Research Opportunities. Vol. 55 No. 1, 2020 pp. 100-111.
30. Shamai, L. (2008). Parents’ involvement in Supporting education of Hearing-Impaired Children in Israel. Procedia-Social and behavioral science journal 209(3) PP.188 -195
31. Serpell.R and Folotiya J.J.(2011).Basic Education for Children with Special Needs in Zambia progress and challenges in the Translation of policy into practice. Psychology and developing societies journal.23(2)pp 211-245
32. Sumbu, M.S Otube, N. and Bunyasi B. A. (2018). Assessment of Academic Performance on Learners with Hearing Impairment in Special Primary Schools in Kenya. International Journal of Education and Research 6(2).
33. Taylor, M. R., and Adams, K. S. (2020). Innovative Approaches to Enhance Accessibility for Learners with Hearing Impairment in Design and Technology Education. Educational Innovations, 42(4), 305-322.
34. United Nations Educational Scientific and Cultural Organization. (1994). The Salamanca statement and framework for action on special needs education adopted by the world conference on special education: Access and quality. Salamanca. Spain, 7 -10 June 1994.
35. Williams, J and Williams, A. (1996). Technology Education for Teachers. : Melbourne: MacMillan Education Australia Pty Ltd.
36. Williams, J. P. (2000). The Only Methodology of Technology. Journal of Technology Education (JTE), Vol. 11, No.2: 1-15.
37. Wright, R. (2008). Associations between end of life discussions, patient mental health, medical care near death and caregiver bereavement adjustment. Bethesda: National Library for Medicine
38. Zohrabi, M. (2013). Mixed Method Research: Instruments, Validity, Reliability and Reporting Findings. Theory and Practice in Language Studies, 3(2), 254-262.