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The Effectiveness Of Handwriting Without Tears Programme In Teaching Handwriting To Students On The Autism Spectrum

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By

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Introduction:

Handwriting is writing done by hand with a pen, pencil, digital stylus, or another instrument. The art, skill, or manner of handwriting is called penmanship (ThoughtCo,2023).

It is a skill that is of great importance to an individual in many ways.It reinforces your language processing and reading skills. It helps one engage with their thoughts, recall and retain information.It can enhance one's critical skills. People argue that the skill of handwriting is no longer needed with the arrival of IPADs and laptops. But handwriting continues to remain significant even in this age of technology. Learning to write strengthens one's motor skills. Research has shown that student success can greatly depend upon his/her ability to write. Writing is a powerful tool because it provides a unique form of feedback. As the student writes, information from the process is immediately and visibly available, which allows the learner to review the reasoning for correctness (The Mathematics Educator,n.d.).

It has also been proven that writing by hand tends to activate certain parts of your brain which are vital for learning and retaining information.This immediate form of communication continues to be an essential skill both inside and outside the class-room, despite the widespread use of technological devices (Katya, 2007).

The importance of handwriting as a skill cannot be overstated however, it can prove to be an incredibly complex skill to learn at times. In order for us to write and write well, a number of sub skills and factors need to be in place.These include vision,body posture,attention span, hand strength,muscle memory,pencil grasp,eye-hand coordination,letter recognition, letter formation and sensory processing skills. Also,contrary to popular belief, handwriting is not always just

picked up and needs to be taught. Especially when you want to ensure correct letter formation and avoid errors.

With changing times, most schools have stopped teaching handwriting completely or have started to invest very little time on the skill. Even a number of teaching programmes do not address handwriting instruction as a course. Nonetheless, the provision of quality handwriting instruction stands absolutely necessary. Whether being taught by teachers or parents, the first step in this process is the selection of an appropriate writing curriculum. Some of the renowned writing curricula include D'Nealian, Handwriting without tears® (HWT), A reason for handwriting and Zaner-Bloser.

HWT® is very popular and is often used by therapists, teachers and parents.The programme teaches handwriting (Pre K through grade five) through interactive elements and multisensory modalities in a developmental fashion.

HWT® claims to be research backed and designed to be easy to teach and easy to learn. The programme can be used to teach print as well as cursive writing in addition to literacy and basic math concepts (LWT, 2023).

Because it is a programme that progresses in a developmental format, it is widely used with special needs children including autism spectrum (AS).

Renad Academy is a school in Qatar that specifically caters to students with autism. Autistic students (in addition to many other challenges) present with a lot of fine motor difficulties including that related to handwriting. The children with AS do indeed show overall worse performance on a handwriting task (Fuentes,2009).

The school is very considerate of all its students' educational needs and diverse learning styles and tries its level best so that all students are able to meet their fullest potential. The students receive Occupational Therapy (OT) services on a regular basis to bridge any gaps that they might have and which are impeding their progress. But since autism is a spectrum and can impact a person's likes/dislikes in a very unusual and different way.While some students enjoy writing activities,alphabets and other academic activities, there can also be students who are not at all motivated to participate in such activities and require a lot of reinforcement to do a little bit. An autistic person's ability to participate in structured, academic tasks can also be greatly impacted by their sensory differences and behavioural challenges. Another factor that can impact a student's handwriting progress is attendance. When students do not attend school regularly, it becomes extremely difficult to help them bridge their respective gaps.

At Renad Academy, although the Occupational Therapist worked on developing precise movements and other important skills needed to write, multisensory teaching modalities and appropriate writing instruction was not always employed in the classroom. At times, the teachers also struggled to understand that traditional writing instruction/teaching methods do not work with autistic students and could not come up with strategies/resources that could facilitate these autistic students' handwriting skills.

Sometimes factors such as different perspectives,emotional exhaustion, inability to prepare appropriate activities and other work related stressors also influenced a teacher's participation in carrying out appropriate activities to build these important foundational skills. As it is, handwriting is such an important skill, but in the case of autism , it can even prove to be the only means of communication and expression. Therefore, the usage and provision of an efficient and structured handwriting programme was absolutely essential and imperative. Moreover, it was

crucial to determine and establish if HWT® could be considered as one of the programmes of choice when it came to teaching writing to students who are on the autism spectrum.

Literature review:

The skill of handwriting is important, not just by itself but also due to its close association to literacy and reading.If we want our students to excel at handwriting and consequently at literacy and reading, we need to start teaching this skill early on in life and perhaps in the most methodical and coherent manner. This is especially true in regards to autistic students who benefit from early intervention in all the areas they lag behind in.The skill of handwriting has many components and sub skills such as muscle tone and control,pencil grasp, formation,legibility and pacing. A number of times, instructors are not well versed in providing appropriate handwriting instruction or do not possess enough tools, resources or know how to introduce and consolidate this very important skill.

Often the choice of what to teach, how to teach, and when to teach is left up to the discretion of individual teachers, who typically have been given inadequate preparation for teaching handwriting.(Sheffield,1996)

While both (neurotypical as well as students with different abilities) can experience handwriting troubles, neurodiverse students particularly those with AS and dyslexia etc. are more likely to go through them. Johnson (2011),in her research explains the handwriting impairments that students with autism and Asperger syndrome present with.She particularly

mentions macrographia and factors that contribute to the inability to form appropriate sized letters.

Although we are far from reaching relevant solutions at present,over the years many handwriting curricula have come into existence that claim to teach handwriting to students in an easy and fun manner.Some even declare to be equally successful with neurodiverse students. The HWT® is one such curriculum. It draws from years of innovation and research to provide developmentally appropriate, multisensory strategies for early writing. (LWT,2023). It is an award winning handwriting curriculum that was developed in 1977 by an Occupational therapist Jan Olsen who was on a mission to make the task easier for her son John. Over the course of time, the curriculum has gained extreme recognition and success, whether it be for usage with neurotypical students or for neurodiverse students.

While conducting my research, I came across many resources that were relevant to my study. While some established HWT® as a superior handwriting programme, some did not did not conclude so. Lust (2001), gathered in her study (that focussed on skill improvement using HWT-Get Set for School) that adding HWT–GSS to the Head Start program proved to be beneficial in improving handwriting readiness skills. This study was conducted using a pre-test post-test design and a significant difference of improvement was noted between the control group and experimental group.

Colleen (2012), carried out a comparative study on HWT® instruction vs teacher designed instruction in first grade classrooms and found that the evidence did not prove that HWT® is more effective than the teacher designed instruction. This study was also conducted using a quasi experimental design and while it supported the use of HWT® as a beneficial multisensory

approach, it yielded no significant difference as to prove HWT® being better than the other approach. Another standardized tool i.e. Minnesota Handwriting Assessment was used to compare the handwriting skills of students here.

Both the above-mentioned researches provided me with extremely valuable insights in terms of methodology too, as my research was also of quasi experimental pre-test and post-test nature.

During my investigation,I came across another interesting study in which Cosby(2009) studied the effectiveness of the HWT® programme in improving an autistic student's handwriting legibility and concluded possible efficacy. Although the sample size in this study was not ideal,this study was of particular interest to me due to the common population group i.e. AS. A tracing method from HWT® was studied here which proved effective in improving written output legibility.

Donica (2015) discovered in her study that HWT-Kindergarten printing curriculum is effective in general education when used via a consultative approach through Occupational therapy. This research had many unique features such as the usage of a static group comparison and the consultative role of Occupational therapist which made it stand out to me. A registered Occupational therapist or two Occupational therapy students were present during handwriting lessons one time per week thereby offering assistance in regards to implementation of the programme or for any other handwriting related difficulty. It also helped the author maintain fidelity of the research. This concept expanded my view and made me reaffirm my consultative role in my own study.In this research,the school was implementing HWT® school wide, therefore the control group was identified as the group of students in kindergarten the year

before HWT ® implementation.

Verma (2018) found in her study that the HWT® programme when used in combination with other multisensory and fine motor strategies were seen to improve handwriting skills. This study was conducted with dysgraphic students in a pre- and post-single-arm interventional study design.The HWT® manipulatives were used in combination with multisensory products and fine motor activities and variables of memory, placement, letter, and word spacing were shown to acquire maximum improvement. Most of these benefits were seen amongst boys and younger children.

Although I found many existing researches that were carried out to determine the HWT® programme success, I did not find anything that included the middle eastern population or something about Qatar or a similar cultural context. Therefore, this literature gap presented as an opportunity to carry out a study to understand the HWT® efficacy with the Qatari population of students who are on the AS.

My selected cohort included students from the Primary Academic department of Renad Academy, a school that caters specifically to students with Autism. All the students of the Primary Academic Department were learning English as a second language and were of varying skill levels/abilities as far as their motor, communication and sensory competencies were concerned.

Research Purpose:

The purpose of this study was to investigate handwriting skill development in autistic students who were using the HWT® programme. .

The study aimed to understand the effectiveness and influences of this programme on the Primary Academic Department (one of the sections in the school) on students who attend Renad Academy.

Questions:

1. Is Handwriting Without Tears ® effective in teaching handwriting to students who are on the autism spectrum?

2. Can Handwriting Without Tears ® have a positive effect on written output for children on the autism spectrum?

Research Hypothesis:

1. The Handwriting Without Tears® programme is effective in teaching handwriting to students who are on the autism spectrum.

2. The Handwriting Without Tears® programme can have a positive effect on enhancing autistic students' written output.

Independent Variable:

The use of HWT® programme (including resources, techniques and strategies).

Dependent Variables:

Effectiveness of HWT® programme on students with autism.

Effectiveness of HWT® programme on improving written output.

Definition Of Terms Supporting The Study:

HWT: Handwriting without tears® programme is a writing curriculum that uses fun, entertaining, and educationally sound instructional methods to teach handwriting to all students: pre-k through cursive. The lessons require minimal preparation time.

LWT:Learning without tears® is a comprehensive research based approach that offers multiple programmes and resources on a web platform to facilitate student learning and critical skills.

AS: Autism Spectrum

OT: Occupational Therapy

Methodology:

This was a quantitative experimental study where the causal impact and effectiveness of the HWT® programme when used with autistic population were studied. The study commenced with securing a written permission letter from Renad Academy's administration/principal.As soon as the approval was obtained, the researcher started collecting a set of pre-intervention data. The sampling was a group of students from five different classes of Renad Academy's Primary Academic section,one of the sections at school.The group consisted of thirty six Qatari children (boys as well as girls) between the ages of five and twelve. All members of the sampling group carried a diagnosis of autism and a variety of specific needs that needed to be addressed on an ongoing basis.

The pre-intervention data was collected through a series of writing tasks that were carried out over a period of one week. The competencies such as ability to form pre-writing shapes,form letters with correct letter formation, size , orientation and placement were recorded. This data set provided information about the students' existing handwriting skills.

Once the students' existing skill levels were established, the teachers/classroom staff who work with the students on an everyday basis started to receive a series of hands-on workshops on HWT® curriculum and strategies to learn about HWT® core practices and resources as to be able to use the programme efficiently with the students.

Following which the participants/students were randomly split into two groups, a control group and a treatment group.The treatment group received a twenty minute session everyday to work upon their handwriting skills using the HWT® programme for a three month period whereas the

control group received a twenty minute session everyday based on instructions using traditional methods.

At the end of the three month period, another data set, i.e. post intervention data, was collected from both the groups and results were compared.

Research Instruments:

The instruments used in this research included pretest data collection and post test data collection via observations , skill based checklists and an anonymous Likert scale survey.

The research commenced with baselining handwriting skills of Primary Academic department students, this baseline was considered the pre-test reading.

Once the pre-test data set was collected, the students from the treatment group began participating in a twenty minute session which included various elements of the HWT® programme such as manipulatives,workbooks,songs/videos, resources and core practices.

At the end of the three month period after the implementation of the programme,another data set was collected from the treatment group as well as control group to analyze the progress that the students had made. This was considered the post-test reading.

At the end of the programme, the teachers were required to fill out an anonymous Likert Scale, which included six questions related to the handwriting development and progress of the students. The aim of this Likert scale survey was to understand educators' attitudes and opinions regarding the usage and efficacy of the programme in question.

Example of handwriting competency skills

Skill	Present	Absent	Difficult	Comment
Scribbles				
Can color staying outside the line				
Can color staying inside the line				
Can form a vertical line				
Can form a horizontal line				
Can form a circle				
Can form a plus				
Can form Frog jump letters				
Consistent letter size				
Consistent letter placement				

Examples of Likert Scale questions:

- Does the HWT® programme help improve autistic students' handwriting skills?

- Is the HWT® programme easy to use with the autistic students?
- Are HWT® resources helpful to teachers working with autistic students?

Data Collection and analysis:

The numerical data collection included pre-test and post-test data and was gathered against student competencies through observations and checklists.The gathered data was then studied and compared to see the gain after treatment of the individual students and for the two groups. Here the gain was considered the difference between the post-test and pre-test scores. This was demonstrated using a two-sample t-test based on the data in range.

As the programme ended,the teachers were requested to fill out an anonymous Likert scale survey , which included six questions related to the handwriting development and progress of the students, post intervention. The aim of this Likert scale survey was to understand educators' attitudes and opinions regarding the usage and efficacy of the programme in questions.

Findings:

After the competency checklists' analysis, it was found that both the groups had exhibited growth in their handwriting skills.

The graph below i.e. figure1 shows that the treatment group exhibited greater difference between pre-test and post-test scores which means that the students in the treatment group mastered more competency levels using the HWT® interventions and resources.

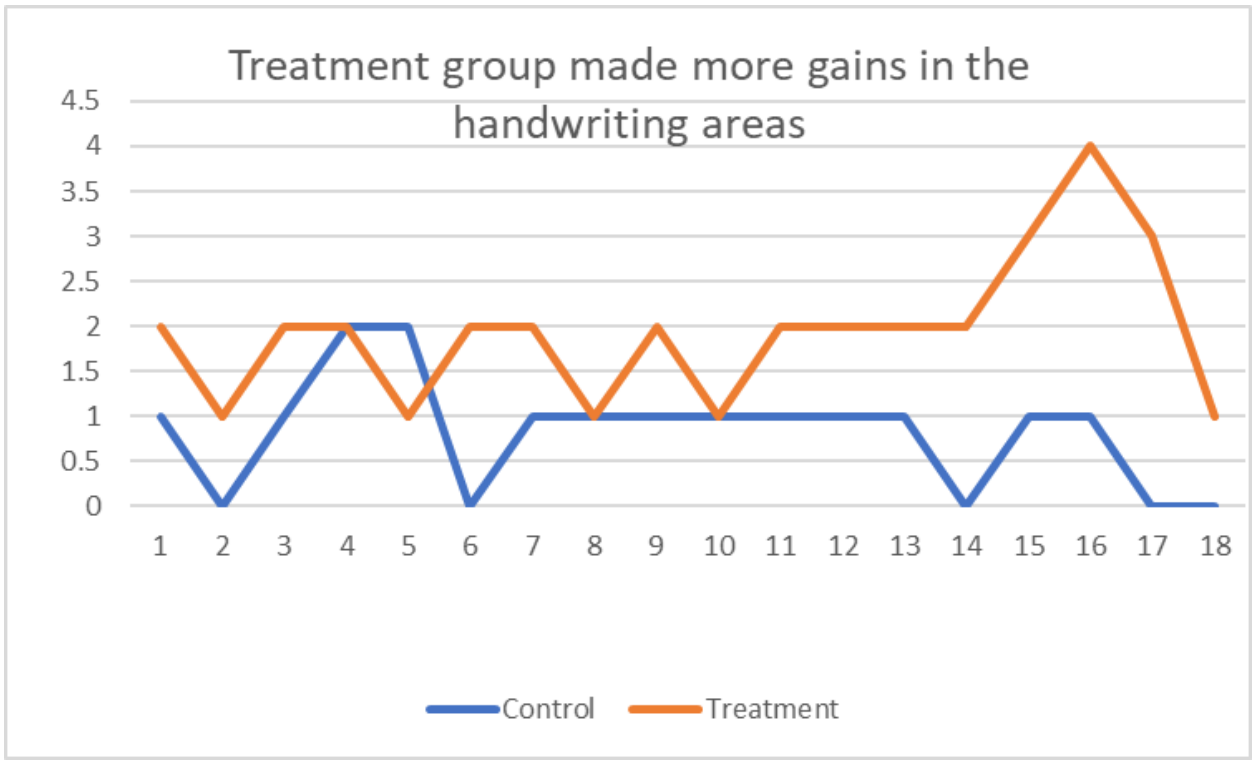
The control group also showed improvements but the difference between their pre-test and post-test scores was comparatively lower.

The results indicated that use of the HWT® materials /resources (videos,golf pencils, flip flop crayons, two lined paper, roll a dough, stamp and see, flash cards,sound around the box, wooden sticks, chalk board) and instructions can prove to be effective and have a positive impact when teaching handwriting skills to students who are on the AS.

It was particularly noted that the programme demonstrates efficacy when working on improving letter size and teaching correct letter formation.

The programme was found to be easy to use, autism friendly and effective as reported by majority of the instructors helping deliver the programme.

Figure:1



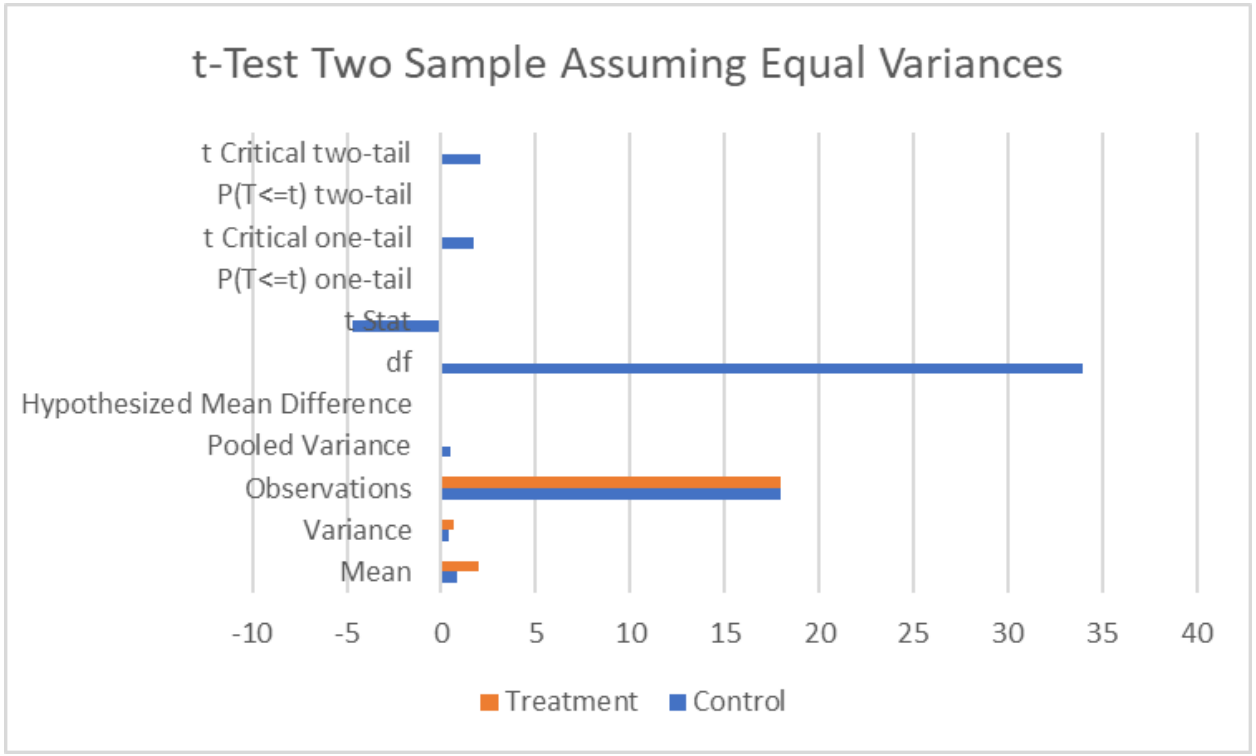
Although it had been established that the students in the treatment group had made more improvements in the handwriting domains, I wanted to see if the difference between these groups was significant. Therefore, I decided to run an inferential statistic on the scores.

I decided to opt for a t-test to compare the means of two groups and determine the level of significance.Upon running the test, it was established that the difference between these two groups was indeed significant.

Figure 2. shows the t-test of the samples assuming equal variances. The value of t is 4.609772. The value of p is .00025. The result is significant at $p < .05$.

T-Test: Two-Sample Assuming Equal Variances

Figure:2



Likert Scale Survey Findings:

The Likert scale survey was taken by twenty teachers and data was collected against six questions pertaining to different attributes of the programme in relevance to autism.

The questions and responses are listed below:

Q.1: Does the HWT programme help improve Autistic students' handwriting skills?

Thirteen teachers reported that the programme was helpful in improving autistic students' handwriting skills, two did not find it helpful and three said maybe.

Q.2: Is the HWT programme easy to use with the Autistic students?

It was reported by eleven teachers that they found the programme was easy to use. Some four teachers did not agree that the programme was easy to use and the remaining five answered maybe.

Q.3: Are HWT resources helpful to teachers working with Autistic students?

Eleven people reported that the programme was convenient, five found it to be inconvenient and four said maybe.

Q.4: Are HWT resources/videos appealing to Autistic students?

Nine people found the programme to be appealing for autistic population, seven did not agree and four said maybe.

Q.5: Would you say that the programme is Autism friendly?

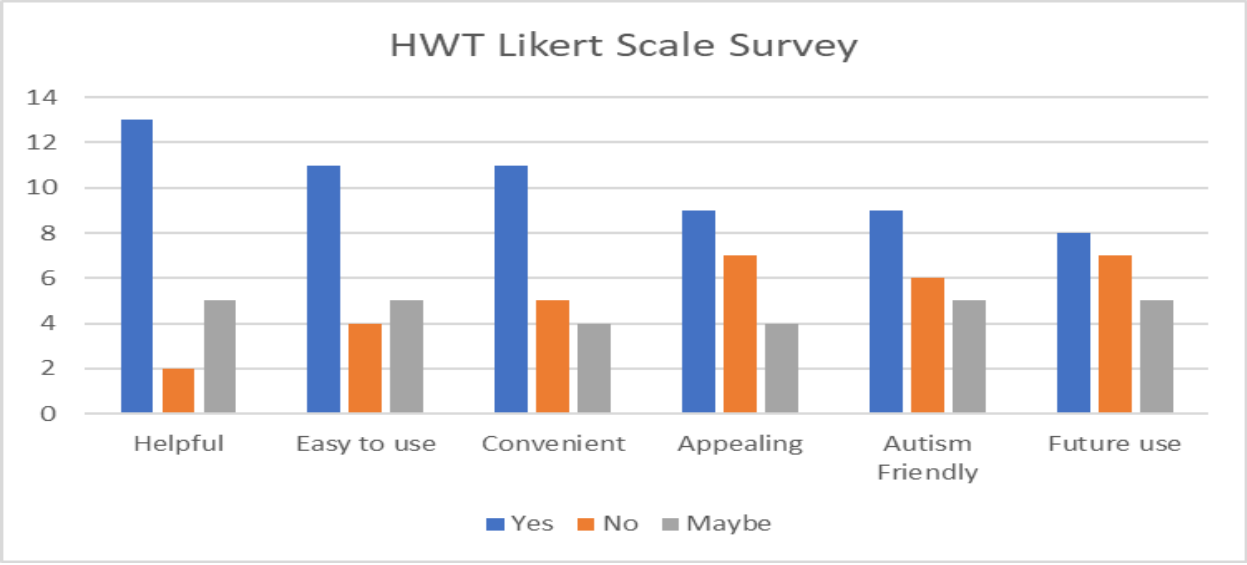
Nine people agreed that the programme was autism friendly, six did not think so and five said maybe.

Q.6:Are you comfortable using this programme to teach handwriting in future?

Eight people said they would consider using the programme in future, seven refused and five said maybe.

Below is the graphic representation of the Likert survey presenting teachers' attitudes and opinions regarding the usage of HWT programme with autistic students.

Figure:3



Conclusion :

The results indicated that use of the HWT® materials /resources (videos,golf pencils, flip flop crayons, two lined paper, roll a dough, stamp and see, flash cards,sound around the box, wooden sticks, chalk board) and instructions can prove to be effective and have a positive impact when teaching handwriting skills to students who are on the autism spectrum.

The programme specifically demonstrated efficacy when working on improving letter size and teaching correct letter formation.

The programme was found to be easy to use, autism friendly and effective as reported by majority of the instructors helping deliver the programme.

As far as the limitations of the study are concerned, classroom attendance did present a problem for several students (from both control and treatment groups). The researcher hypothesizes that student performance would have been enhanced if the students were more regular.

It was also noted that certain materials such as chalkboard, crayons and golf pencils etc. can prove to be hazardous for students who present with sensory (oral) seeking behaviours. The students who presented with gravitational insecurity and auditory hypersensitivity struggled to participate in action based songs by the programme.

Collaboration with staff in certain classes appeared challenging at several points, especially when they did not want to use the programme as instructed or were short staffed.

Nonetheless, the outcomes of this study support and extend previous research that were carried out to study the efficacy of the programme.

Project considerations:

The primary potential threat to this research was lack of time as the first term of the school year was being cut short by one and a half months owing to FIFA World Cup 2022 taking place in Qatar. This shortening of duration did influence and prolong the process of data collection and delivery of workshops.

Other factors which impacted the study were staff and student attendance. Although the students did make significant improvement with the given attendance, the results could have been far superior if the attendance would have been consistent.

The students' behaviour and sensory differences also affected the quality of this study as these factors impaired their ability to receive instruction properly, participation as well as performance. Many students were seen mouthing smaller objects, flip flop crayons and wooden sticks which distracted them from the task and could have been hazardous. Some of the activities and videos required a lot of movement on students' part, therefore the students' who were gravitationally insecure or hypersensitive to certain movements/sounds exhibited difficulties.

A very big part of this research project was classroom staff participation in instruction delivery and carrying it over/generalizing it throughout the day. Some teachers participating in the research were set in their traditional ways and displayed difficult behaviours which made the whole experience a little rough. Since, the study was dependent upon the classroom staff's assistance and collaboration, when that did not happen effectively (in certain classes) provision of services was impacted and contributed negatively to the study.

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