Effect of The Listening Program® on the Improvement of work Skills; Attention span and Rate of work (Speed) of students diagnosed with MID under Vocational Training

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ABSTRACT

The therapeutic effect of The Listening Program® on the students' attention span and rate of work to improve productivity and success rate was investigated. Pre- and post Valpar Component Work Sample -7 test assessment, Personal Development Mentor /Vocational Training Class instructors, and therapists' observations were carried out to monitor changes in the students' work behaviors during a 18-week study period. Parental interviews were also conducted during this period. In this study, the investigators examined how The Listening Program (TLP®) help improved the attention span and Rate of work (speed) to increase work productivity among students with Mild Intellectual Disabilities (MID) who were undergoing vocational training. The results were analyzed and the implications for practice and further research were discussed.

Keywords: The Listening Program®, Valpar Component Work Sampe-7, Attention Span, Rate of Work, Mild Intellectual Disability (MID), Vocational Assessment

Introduction

Commitment to focus and accomplish a task requires sustained attention and rate of work (speed). Attention span, together with precise pacing or speed in accomplishing a task are two of the work skills that are required to accomplish a task in a duration of time, and these two work skills are essentials to meet the demands of the task in vocational school.

As occupational therapists, the investigators had interest and believed in music as an effective tool to regulate self, and have tried to use it during the therapy sessions over a period of time. Consequently, the investigators attended the on line The Listening Program® course as part of their professional development.

After attending the course for TLP® program, the investigators were inspired to conduct an action research to see how the program benefit and help the students with their performance in a vocational school.

Background

TLP® became first available in 1999, it is similar to other music listening therapies as it utilizes modified music to improve auditory perception and related function. However, TLP® has much more extensive scope. TLP® is a music listening therapy that provides brain stimulation to improve performance in school, work, and life. Systematic training is provided through listening to psychoacoustically modified classical music, which trains the brain to process sounds more efficiently which leads to improvements in learning, attention, listening, communicating and other skills (Doman,G.A. & Lockhart L.,D. (2012)

TLP is a fusion of beautiful art and sound science. The masterfully performances of the award-winning players of Arcangelos Chamber Ensemble are skilfully crafted using advance audio technology to provide an unrivalled listening experience. TLP's psychoacoustically modified music and patent-pending production techniques are designed to exercise the different function of the auditory processing system. This enables the brain to better receive, process, store and utilize the valuable information provided through the varied soundscape in our lives such as music, language and the environment in which we live.

The current study was conducted in a vocational training school for persons with mild intellectual disabilities (MID) in Singapore. TLP was first introduced in the school in 2010 by the occupational therapists. The school also designs vocational training modules to train, assess and award students with the Singapore Workforce Skills Qualifications (WSQ). The vocational school is a Workforce Development Agency Approved Training Organization (ATO) from mid-2008, and it provides a responsive and a unique vocational curriculum that meet the diverse needs of students with MID. The school's vision is to provide the support needed by the student to enable them to be part of Singapore's workforce for successful employment. The school caters to the vocation training needs of persons with MID from the age of 17 – 21.

Theoretical Frameworks

Most people like to listen to music while they work and the investigators are no different. Some individuals may even perform better at work with music on.[7] Whilst there may be many reasons for wishing to listen to music in the workplace, research suggests that it contributes to improve individual's productivity. According to Pavlygina RA, Frolov MV, Davydov VI, Milovanova GB, Sulimov AV. Recognition of visual images in a rich sensory environment: musical accompaniment. Neurosci Behav Physiol. 1999 Mar-Apr; 29(2):197-204. PubMed, a person's ability to recognize visual images, including letters and numbers, is faster when either rock or classical music is playing in the background

Music is one of the few activities that involve using the whole brain. It is intrinsic to all culture and can have surprising benefit not only for learning language, improving memory and focusing attention but also for physical coordination and development; of course music can be distracting if it is too loud or too jarring (http://www.emedexpert.com/tips/music.shtml#ref28). Music has long been known to have therapeutic value (Ferguson & Voll, 2004; Sacks, 2006). In recent years, occupational therapists, speech-language pathologists, and psychologists have adopted the use of music and sounds as therapy, and a variety of auditory intervention techniques have become available. Occupational therapists use music as preparation for therapeutic activities based on the belief that sensory input through the auditory and

vestibular system scan be calming and organizing to children (Ayres, 1979; Frick & Hacker, 2001).

Other research conducted in Stanford California cited that music engages areas of the brain involved in paying attention, making predictions and updating the event in memory (neuron magazine Aug 1, 2007). The researchers caught a glimpse of the brain in action using functional magnetic resonance imaging or fMRI, which gives a dynamic image using which part of the brain are working during a given activity. The goal of the study was to look at how the brain sorts out events, but the research also revealed that musical techniques used by composer 200 years ago help the brain organized incoming information. "In a concert setting for example, different individuals listen to a piece of music with wandering attention but at a transition point between movement, their attention is arrested" (Vinon Menon, 2007, Vol55No.3)

The clinical experience of the investigators of the current study were also aligned with the findings in the studies in this area, attention span and rate of work are indeed complex and important areas which deserved closer examination and these provided the key impetus for the current study. In addition, the lack of local study also justified this project.

The study

Participants:

23 students in their first year in the school were selected for this study. The students were selected for the following reasons; 1) they had just recently participated in the vocational assessment administered prior to their admission in the school, and 2) scored low (performed poorly secondary to number of errors and timing) in the VCWS-7 rate of work assessment.

The participants were 16 to 18 years in age. 19 of the participants are male. 14 of the students were in the Hospitality and Services Vocational training course, and the other 9 were attending the Food and Beverage Services training. All participants were students diagnosed with mild intellectual disabilities. The students were further divided into 4 groups, and each group is consisting of 5 students, the remaining 3 consisted of 6 students each.

Inclusion and exclusion criteria

INCLUSION: Participants in this study are students' age from 16 to 18 years old.

Students are diagnosed with MID not associated with other conditions e.g., autism spectrum disorder (ASD) or other pervasive developmental disorder (PDD)

EXCLUSION: Students reported or assessed to have visual perceptual problem, auditory processing issues, profound hearing loss, and medical instability

Standardized Test Administered

*Valpar Component Work Sample -7 (VCWS7) MULTI-LEVEL SORTING***-** is an assessment tool that assesses the ability to make rapid sorting decisions involving several levels of visual discrimination of color, numbers, letters, and combinations of these. The work sample simulates light work and involves repetitive finger grasping and reaching. The physical demands are made upon includes reaching, fingering, near acuity, depth perception, accommodation, color vision, and field of vision. Significant form perception, motor coordination, finger dexterity, manual dexterity, and color discrimination are required to perform the work sample at a competitive level. The work sample elicits information on several work-related characteristics, including, among others, attention, concentration, communication skills, decision-making ability, frustration tolerance, and problem conceptualization.

Methods

The participants underwent TLP which entailed daily 30-minutes sessions from Monday to Friday. During the entire study period/ program, one dedicated area in therapy room was set up to facilitate the program. The area was set up with 6 tables and chairs, and 6 headsets. During the program, the students were given with simple tabletop tasks as they listened to music.

Investigators conducting the program observed and recorded participants' behaviors

during the sessions. At scheduled occasions, the investigators also gathered data on the participants' attitudes and work behaviors in their respective vocational class (VC) lesson. These provided multiple sources of observational data across settings for the purpose of this study.

As a pre-test (VCWS-7 test) was conducted before the commencement of the program, a post-test using the same instrument was also conducted. Data generated were analyzed along the process data generated during the session.

The PDM and vocational training instructors were requested to fill up and complete the Pre-observation checklist. In the Pre-observation check-list, PDM or Vocational instructors/trainers are requested to check the work skills and behaviors of the selected students.

Findings

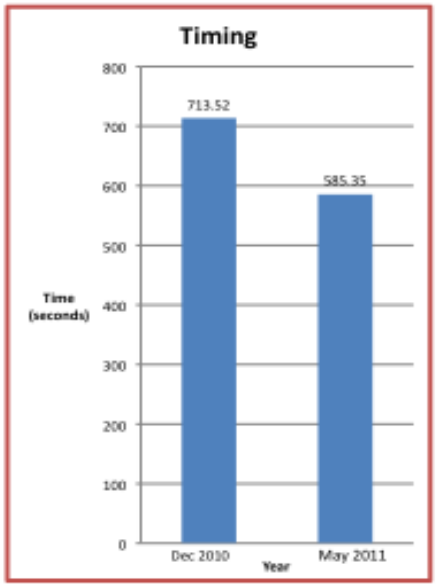
Quantitative Data

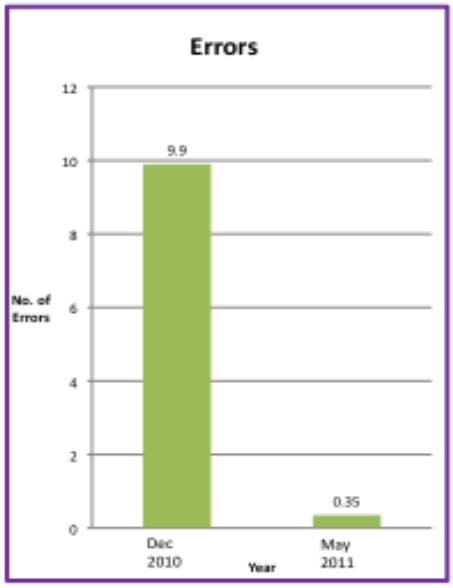
Figure 1

Figure 1 shows the VCWS-7 pre- and post testing result.

		Valpar 7 Results December 2010				Valpar 7 Results May 2011							
Name		Time (Seconds)	# 0f Errors	Rate of Work	Outcome	Time (seconds)	# of Errors	Rate of Work	Outcome (Time)		Outcome (Time)		Final Results
1. Student A1	FB1T1B	629	8	83.88 %	Failed	448	0	117.73 %	P	Faster: 68 sec.	Passed	From 4-0 errors	PASSED
2 Student A2	FB1T1B	660	NONE	79.91 %	Failed	565	0	93.35 %	Passed	Faster: 64 sec.	Passed	0-0 errors	PASSED
3. Student A3	FB1T1B	538	5	98.3 %	Failed	417	0	126.48 %	Passed	Faster: 121 sec.	Passed	From 5-0 errors	PASSED
4 Student A4	FB1T1B	756	14	69.77 %	Failed	598	1	88.20 %	Passed	Faster: 158 sec.	Passed	From 14-1 errors	PASSED
5. Student A5	FB1T1B	654	2	80.64 %	Failed	490	1	107.64 %	Passed	Faster: 164 sec.	Passed	From 2-1 errors	PASSED
6 Student A6	FB1T2	870	4	67.62 %	Failed	598	1	88.20 %	Passed	Faster: 272 sec.	Passed	From 4-1 errors	PASSED
7. Student A7	FB1T2	636	9	82.93 %	Failed	601	0	81.14 %	Passed	Faster: 35 sec.	Passed	From 9-0 errors	PASSED
8. Student A8	HS1T1	861	1	61.26 %	Failed	544	1	96.95 %	Passed	Faster: 211 sec.	Passed	1-1 errors	PASSED
9. Student A9	HS1T1	370	5	142.55 %	Failed	358	0	147.33 %	Passed	Faster: 12 sec.	Passed	From 5-0 errors	PASSED
10. Student A10	HS1T1	700	2	75.55 %	Failed	483	0	109.20 %	Passed	Faster: 217 sec.	Passed	From 2-0 errors	PASSED
11. Student A2	HS1T1	673	8	78.37 %	Failed	585	0	90.16 %	Passed	Faster: 88 sec.	Passed	From 8-0 errors	PASSED
12 Student A4	HS1T2A	678	2	77.79 %	Failed	516	0	02.21 %	Passed	Faster: 162 sec.	Passed	From 2-0 errors	PASSED
13. Student A6	HS1T2A	757	12	70 %	Failed	578	1	91.25 %	Passed	Faster: 179 sec.	Passed	From 12-0 errors	PASSED
14.Student A8	HS1T2A	777	2	67.88 %	Failed	943	0	55.34 %	Regressed	Slower:166 sec	Passed	From 2-0 errors	FAILED
15. Student A10	HS1T2A	1,017	3	51.86 %	Failed	1,085	1	41.61 %	Regressed	Slower: 68 sec.	Passed	From 3-1 errors	FAILED
16. Student A12	FB1T2	511	3	103.22 %	Failed	496	0	106.34 %	Passed	Faster: 15 sec.	Passed	From 3-0 errors	PASSED
17. Student A14	HS1T2A	738	1	71.47 %	Failed	396	0	133.19 %	Passed	Faster: 342 sec.	Passed	From 1-0 errors	PASSED
18. Student A16	HS1T2B	685	1	77 %	Failed	534	2	98.77 %	Passed	Faster: 151 sec.	Passed	From 1-2 errors	PASSED
19.Student A18	HS1T2B	1,255	6	42.02 %	Failed	1,057	5	49.90 %	Improved	Faster: 198 sec.	Improved	From 6-5 errors	FAILED
20. Student A20	HS1T2B	524	27	100.65 %	Failed	485	2	108.75 %	Passed	Faster: 39 sec.	Passed	From 27-2 errors	PASSED
21. Student A22	HS1T2B	600	108	87.90 %	Failed	517	0	102.02 %	Passed	Faster: sec.	Passed	From 108-0 errors	PASSED
22. Student A24	HS1T2B	1,006	1	52.43 %	Failed	696	3	75.78 %	Improved	Faster: 310 sec.	Regressed	From 1-3 errors	FAILED
23. Student A26	HS1T2B	516	4	102.21%	Failed	696	3	75.78 %	Improved	Faster: 310 sec.	Regressed	From 1-3 errors	FAILED

Figure 2





Result: Improved Speed

Result: Decreased Number of Errors

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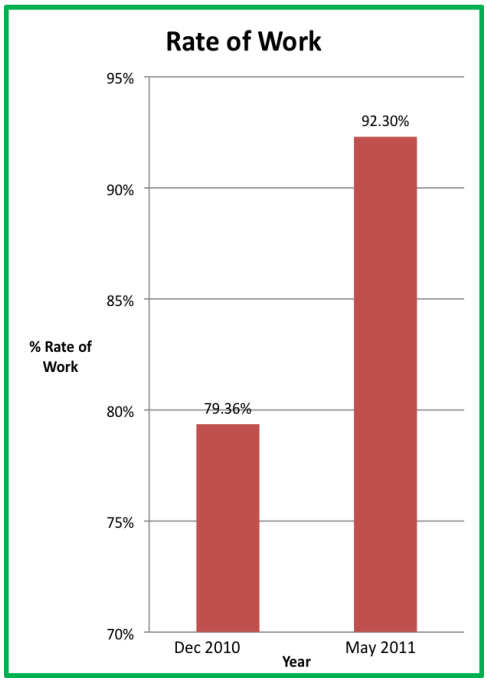
Figure 3



Qualitative Data

Based on the Pre- and Post-parents and vocational training Feedback,VC trainer/PDMs comments, it is noted that participants showed

Increase in:

- Interacting with family or others (22/23)
- Eye contact/listening to what is said (20/23)
- Concentration/involvement in activities (20/23)
- Improve with sleeping pattern (20/23)
- More focus (20/23)
- Organize (20/23)

Decrease in:

- Tendency to be forgetful (23/23)
- Anxiety over change (23/23)
- Distractibility (20/23)

Participants' test result on the VCWS-7 for both the pre –and the post-test were illustrated in figure 1. In the pre –test result, participants' numbers of errors was at 9.9%while number of error for the post-test decreases to 0.35%. The percentage of the rate of work in pre-test was at 79.36% and 92.30 % in the post-test. Both indicators demonstrated that the participants improved in their performance in the Valpar Component Work Sample 7 test. The mean rate of improvement as measured in terms of outcome time and reduction of errors were 168.17%.

Based on the result extracted from the parental interviews, majority of the participants demonstrated improvements in terms interpersonal relationship skills, 22 out of 23 parents reported that the student's interacting with other family members skills has progressed significantly . 20 out of 23 participants have demonstrated improvement in their eye contact, concentration/involvement in activities, improve with sleeping pattern, became more focus and organize. Memory and the ability to be distracted were positively affected in all participants. Vocational trainers and PDMs agreed that most of the students after participating in the program have improved their performance in vocational training lessons; they are more compliant and organized.

Discussion

A key finding of the current study was that all the participants monitored in this study improved significantly on their attention span and rate of work. Most of the parents surveyed noted that student's attention span to task at home and communication skills had improved. Some PDMs in the program had suggested expanding this program to others with work related behaviors, and to other students whose diagnoses are associated with other medical condition e.g., ADHD, ADD

The data from the VCWS-7 test suggested that TLP was a key factor in the improvement shown in the participants. The regular clinical observation and feedback by the different stakeholders supported the link between participation in TLP and the improvements. This finding is consistent with other studies found in

www.advancebrain.com demonstrating positive outcomes using TLP. Such studies have been published through various journals and articles, e.g. evaluating the effectiveness of TLP training for children who are underachieving in a State by Gwyneth Jeyes, M.Ed., and Educational Psychology/Special Needs. The goal of the study was to determine if use of TLP in school was effective, despite all the compromises made to accommodate it as an integral part of the curriculum. In her research, the used The Quest Test of pre-reading skills was used to assess auditory discrimination and memory. Tests involving visual skills and perceptual motor skills were carried out in order to try and establish whether there was only an auditory problem present. The findings of her research showed that TLP is an effective intervention and can be used in a real school to raise levels of achievement.

The current study provided evidence that suggest the potential of the Listening program for individuals with mild intellectual disabilities undergoing vocational training. The benefits of the Listening program appeared to be suited for use along with other education and psychosocial interventions such as vocational training, physical education, and job placement.

However, without a control group, the investigators were unable to conclusively isolate the impact of the program as the participants were exposed to other programs such as Physical Education (P.E)., speech therapy and classroom lessons. A control group should be in the follow up studies. In addition, the small sample size limited the generalisablity of the findings of the current study.

The implications for practice as highlighted in the current exploratory study are: 1) the further use of listening program in addressing attention span and work-related behaviors difficulties for person with MID in a vocational school setting, 2) future research

in isolating the impact of listening program on specific work-related problems such as errors or attention span and long-term effects of listening program in aid of person with MID’s work and employability.

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