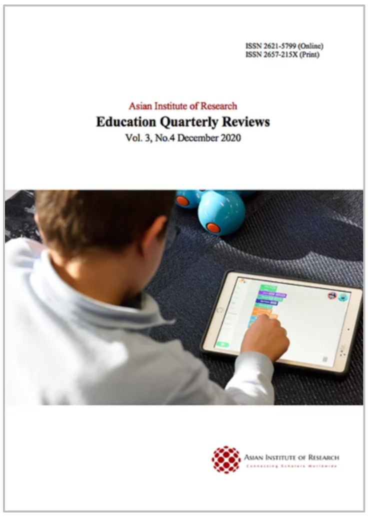

Education Quarterly
Reviews

Floresca, Jocelyn Alberto. (2020), How Nature Walk Program Affects the Behavior of Children with Learning Disabilities. In: Education Quarterly Reviews, Vol.3, No.4, 500-509.

ISSN 2621-5799

DOI: 10.31014/aior.1993.03.04.157

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The Asian Institute of Research *Education Quarterly Reviews* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of education, linguistics, literature, educational theory, research, and methodologies, curriculum, elementary and secondary education, higher education, foreign language education, teaching and learning, teacher education, education of special groups, and other fields of study related to education. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Education Quarterly Reviews* aims to facilitate scholarly work on recent theoretical and practical aspects of education.

Asian Institute of Research
Connecting Scholars Worldwide

The Asian Institute of Research
Education Quarterly Reviews
Vol.3, No.4, 2020: 500-509
ISSN 2621-5799

DOI: 10.31014/aior.1993.03.04.157

How Nature Walk Program Affects the Behavior of Children with Learning Disabilities

Jocelyn Alberto Floresca[1]

[1] Human Kinetics Program, College of Science University of the Philippines Baguio. ORCID ID: https://orcid.org/0000-0002-9454-7853

Correspondence: Email Address: jafloresca@up.edu.ph / Mailing Address: Human Kinetics Program College of Science University of the Philippines, Baguio Gov. Pack Road Baguio City Philippines, 2600. Phone/Cellphone Number: +639175197237

Abstract
Experience with nature is particularly known to influence a person's health and wellbeing. This case study identified behavioral changes in children with learning disabilities who underwent the Nature Walk Program. An intervention tool designed to let the participants experience nature activities. The study's participants have cases of mild autism and down's syndrome. Undergoing the Nature Walk Program resulted in the increased positive desire to participate in succeeding intervention sessions, improvement in their memory level, and awareness and sensitivity to the natural surroundings. All of these led to positive behavioral changes. Another important factor found in the success of the program as an intervention tool is the facilitators' knowledge in handling the activities, which helps in the success of this endeavor. The study's intervention tool hopes to be a model and instrument in affecting participants' awareness of themselves with the aid of the natural environment through carefully selected outdoor activities. As a conclusion, utilizing the natural environment can also affect emotional behavior, social relationships, and the actual state of mind of children with learning disabilities.

Keywords: Adapted Physical Activity, Natural Environment, Nature Activity, Intervention

1. Introduction

The conduct of outdoor activity utilizing the natural environment as a tool to develop the students holistically is an important element in the school setting (Floresca, 2015; 2019). Both physical endeavors and exposure to nature are known individually to have positive effects on physical and mental health (Pretty et al., 2005). As physical activity can affect both physical and psychological well-being (Scully et al., 1999), Pretty et al. (2005) hypothesized that there might be a synergistic advantage in doing physical activities while being directly exposed to nature. Hayashi et al. (1999) call it the 'green exercise'. It is more established that the natural and built features of the environment affect behavior, interpersonal relationships, and actual mental states (Frumkin, 2001). Lewis and Booth (1994) also mention that it can be therapeutic or pathogenic. Encounters with adjacent nature help alleviate mental fatigue by relaxing and restoring the mind. Indoor built environment parks and green spaces are settings for a mental break, as it reassures social relationships and removing stress through exercise or conversation and provide therapeutic settings. Wolf and Flora (2010) stated that play and exercise are an essential part of both children's and adults' physiological development and brain function. For children, these activities can help develop cognitive thinking and reasoning abilities (Kirby, 1989).

According to Alter (2013), healers in Japan and Germany have long heralded the benefits of natural therapy. He mentioned that the Japanese version of natural treatment through forest bathing, involves patients walk for prolonged periods through forested areas. While inhaling the scents of nature in an area shaded by trees has helped in the healing sessions. Alter (2013) also mentioned German Kneipp therapy, which similarly requires that patients perform physical exercises in forest clearings. These alternate therapies are not just another cultural coincidence, and researchers in the field have found that people who need to elevate their health status enjoy various benefits, compared with people who walked through urban areas.

The American Association on Mental Retardation (AAMR) recognized people who have mental delay has an IQ of about 70 or under, coexisting disadvantages or impairments in adaptive functioning in two areas (communication, self-care, home living, social or interpersonal skills, the use of community resources, self-direction, functional academic skills, work, leisure, health, and safety), and onset before age 18. Petrenko (2013) stated that children with developmental disabilities are at higher risk for internalizing and externalizing behavior problems than children in the general population. Having effective prevention and treatment programs are necessary to reduce the burden of behavioral issues in this population. Research has documented the presence of higher rates of behavioral problems in children with developmental disabilities as early as 3 to 4 years of age (Tonge, 2007). These findings highlight the need for early intervention to prevent and treat behavioral problems in this population, which may prevent or lessen the emotional and financial burden of individuals or families with members who have such cases.

Specific to this study, the definition of learning disability or others call it learning difficulties (or mental disability) is a condition of known or unknown origin that impairs various areas of a child's functioning and is expected to be life-long. This definition was used for this study referring to its child participants who are suffering from mild autism (AU) spectrum disorder and down's syndrome (DS).

From a public health perspective, prevention is more effective than intervening after problems have already emerged. Wherein the delivery of preventive interventions can be in a variety of formats (individual, family, group, and self-directed) and settings (in-home, school, community center, mental health clinic, among others).

Given the nature of risk and protective factors facing young children, the two most common types of delivery methods include parent training and school-based interventions. Parenting interventions stemmed from research on family interactions (Petrenko, 2013). While childcare centers and schools are often optimal settings for interventions with young children (Doyle, 2018). Since curricula can be integrated naturally within the school day and can reach the majority of children in this age group. School-based interventions have the potential to contribute to children's competent development by providing nurturance, teaching cooperative social skills, and enhancing cognitive and emotional growth in this manner. Diamond and Lee (2011) have proven that applying diverse activities helps in improving children's executive functions used in their daily lives.

There are already new educational styles utilizing the concept of the natural setting to educate a child. The idea of the 'Forest Schools' has gained acclaim in the United Kingdom as well as in Asia (Harris, 2017; Maynard, 2007; O'Brien and Murray, 2007). Also introduced in Scandinavia, where children spend much of their school mornings in the outdoor classroom. Kennedy R. (2014) stated that the benefits of the forest classroom for children include full-body movement, rich sensory experiences, improved cognitive activity, mental acuity, and concentration. Taking children outside of the classroom to the outdoors can transfer their learning to the physical space allowing for more physical mobility (Harris, 2017). Areas for learning connects with practices, norms of behavior, objectives, and goals for learning (Peacock & Pratt, 2011) so that new learning spaces can provide different contexts and environments for children's learning (Harris, 2017).

A growing movement in the western world where most pediatric medicine and occupational therapy (Hanscom, 2014) prescribe the use of outdoors for treatment. The practitioners of this movement view nature as the ultimate sensory experience for all children and an essential form of prevention for sensory dysfunction. In this type of program, they see playing outdoors as therapeutic in design (Coon et al. 2011). Hence, they do tree climbing, bird watching, nature walks, building forts out of materials seen in the playground, and many more. With the aid of several partner organizations and many volunteers, the practitioners of this movement also know its importance. The use of outdoors must also be clean, safe, available, and with different options in activities that best match the interests of the patient or their family and their schedule.

Because of these ideas presented above, this research attempts to introduce the concept of bringing children with learning disabilities to the natural environment and make it a tool for alternative educational strategies. Thereby, the Nature Walk Program was adapted to let the children experience what nature can offer to their actual state.

2. Methodology

This study's research design utilized a qualitative case study of children diagnosed with (2) mild autism spectrum (AU) and (2) downs' syndrome (DS). Through the Nature Walk Program, this intervention technique that uses environmental exercises as the primary tool investigated the possible effects on the participants' areas of development. It aims to identify behavioral changes brought about by exposure to the natural environment of school-based children who have learning difficulties. By exposing these children, it hypothesized that it would likely result in the possibility of positive behavioral changes.

The main objective of the study is to provide reports on the behavioral changes of the participants brought about by the intervention tool, which is the Nature Walk program. These changes are in terms of their emotional and social behavior, perceived physical exertion, mental ability based on the memory test. Lastly, to answer if the tool is useful in improving the participants' social, emotional, intellectual, and physical parameters.

2.1. Participants. The study has four (4) participants with mental states that are mild (educable) to moderate (trainable) with a mental age between 5 to 11 years old. They have a hard time learning academic subjects in school. With the approval of their guardians, the research was able to gather four (4) Filipino school-age children, three (3) males with a biological age ranging from 11 years old to14 years old and one (1) 15 years old female, 2 are with cases of mild autism and 2 with down Syndrome. Participants' mental retardation falls into the moderate classification. Children with mild autism cases are being academically trained by their Special Education teachers to move into a higher-grade level in their school. At present, all four participants belong to lower primary grade, a second-grade level class designed for students who have mental retardation based on clinical standards.

2.2. Procedure. The procedure for the research started with a pilot study that took place in the school vicinity for an introductory phase — followed by selecting the actual participants using the criteria set for the study. Upon the completion of the number of participants and also asking the parents of their consent for their children's participation, they were all gathered for a pre-orientation and pre-assessment. Upon initial orientation and selection of participants, the guardians and teachers were asked of their mental age vis-à-vis their biological age. The determination of the participants' mental age was through a clinical assessment done by a clinical psychiatrist- a procedure which the children must undergo for the school to identify teaching methods and grade level assignment.

The interventions took place on sites that met the criteria for the selection for the study. Such as, having abundant flora (plants and trees) species, secluded from the urban setting, abundant avian species, mountain range view, and very accessible to the participants (a decision made due to some of the participant's condition). These places were: 1). Camp John Hay Eco-Trail, Baguio City Philippines with a Latitude of 16.3999419°N, Longitude of 120.6134033°E, and with an elevation of 4878.609 ft. (1487 Meter Above Sea Level). 2). *Mt. Cabuyao*, Tuba Benguet Philippines with a Latitude of 16.33492472°N, the longitude of 120.56076765 °E, and with an elevation of 7273.622 ft. (2217 MASL). 3). *Avong Nen Romy*, *Wangal* La Trinidad Benguet Philippines with a Latitude of 16.462359 °N, the longitude of 120.569516°E, and with an elevation of 4573ft. (1393.85 MASL).

To check for the improvement of the participant's memory, we introduced them to the memory recall game. This is to ask about the things they have seen during the intervention. A memory game or others call it brain games (Heiman, 2014; Smith et al., 2009) was devised to find out the participants' possible development in their intellectual ability. This memory game is designed specifically for the intervention; it contains sets of pictures taken in the field during the activities. These are random pictures of anything the participants will come across as they venture to the sites. We ask the participants to tell what those in the photographs are. At the end of the presentation, the participants must draw everything they could recall, using paper, color, and pencil. Later, they are asked to tell about their drawings.

In finding out the perceived level of exertion of the participants, the study utilized the hard activity chart in the form of a pictogram based on the Borg scale 10-point level Rating of Perceived Exertion (RPE) as an assessment tool. RPE is a broadly used and dependable indicator to monitor and guide exercise intensity (Borg, 1982; Williams, 2017). The scale allows individuals to subjectively rate their level of exertion during exercise or exercise testing (American College of Sports Medicine, 2010). But since the participants of the study cannot express themselves in words, they were carefully observed and, at the same time, occasionally asked how they feel through their guardians.

Outside of the intervention sessions, it was the children's guardians, who served as key informants and provided the information on their emotional and social behavior. Studies show that parental perceptions of children with mental health problems play an essential role in the determination of services for intervention (Abera et al., 2015; Nock and Photos, 2006). Because of these, the study understands that the participants could not say directly what they are thinking; therefore, it is appropriate that it was their guardians who answer questions regarding the survey. Information was gathered through open-ended interviews and focus group discussions. Also, the researcher took field notes and videos coupled with photographic documentation.

The participants were engaged in an activity unusual to the Education curriculum in the Philippines— inspired by the events mentioned in the conduct of forest schools (O'Brien, 2009, O'Brien and Murray, 2007; Maynard, 2007; Lam, 2018). Where forest school is defined by Harris (2017) *as a practice sometimes described as 'alternative education,' but it is increasingly incorporated into normal school activities even though not a part of the national curriculum. It operates at a common interest in reconnecting children with nature, increasing the provision of outdoor education, and the development of play-based learning and child-centered pedagogies.*

The definition of the Nature Walk Program as an Adapted Physical Activity (APA) in this study is a set of events that will immerse the participants in nature. For this specific exercise, participants were not only asked to walk, they also perform the following in no particular order:

- Practice listening to the sound of nature.
- Look for anything at the site of intervention that would be of interest to them.
- Find any specific object in the vicinity that would help them solve a particular 'problem set' by the teacher (researcher).
- Look for any insect that would be of interest.
- Watch out for birds and tell if they were able to see some while in the vicinity (bird watching).
- Practice counting by the aid of plants (trees, flowers, leaves, branches) found in the sites of intervention.
- Put up tents with their co-participants and be able to perform tasks at hand.
- Look for different shapes in the ground or sky or branches of the trees that would look like anything.

The participants, together with their guardians, were brought to the different sites – during the weekends on various locations. Taking into consideration their health background and their medical history, which was a basis for designing activities.

The study implemented Burns and Groove's (2001) statement in the observance of ethical principles being relevant to the study.

The principles of respect for persons in the community, beneficence, and justice; Principle of respect relates to the right of the respondents for self-determination and freedom to participate or not. The principle of beneficence requires the researcher to 'do good and above all do no harm,' and the law of justice- wherein this study will treat the respondents fairly (Belmont report).

Consent was obtained from school authorities at the proposal stage. The guardians were also asked for their consent to conduct the research and those who agreed, were also asked for permission to document through photograph and videotaping. The participants' identity was dealt with the utmost respect.

After two (2) months of weekly intervention, the program was handed to their guardians, where they were asked to continue the activities during their free time. They were asked to take note of their child's behaviors and possible improvement in their academic work.

3. Results

Observations, field notes, interview results together with photo and video documentation were transcribed and analyzed through a qualitative analysis; thus, the results.

Before the staging of the study, the children are undergoing training for Independent Living (IL), a form of occupational therapy offered by a Non-Government Organization (NGO). The other participants do not have formal training it is only whatever their guardians teach them in their own homes.

The participants are enrolled in the Individualized Educational Program (IEP) of the Department of Education for Special Children. Teachers expressed that because of the children's cases, they are mentored separately in reading and basic mathematics. With the ratio of teacher to students with 'special' cases (8-10 students per teacher), the teacher expressed that it is hard for them to teach the children. At the time of the study, there is also a limit of Adapted Physical Activity (APA) for the children. This is partly because of the lack of facilities for the APA program and those that will teach them. Some participants are familiar with each other since they attend the same class but do not share the same interests, for some, they just met during the interventions.

Participant A can communicate but must be asked continuously about what he feels because he cannot easily express his feelings. He is very conscious about time and always motions that everyone is lazy and slow. He likes to do things fast. He feels easily bored more than the other participants and likes to count everything in his sight.

Participant B has echolalia wherein he always repeats the words he hears and does not speak unless he feels repeating the words or sounds, he hears. He conveys his emotion by the manner of facial expressions and body language. When he is enjoying something, he sings and walks around gleefully with a smile on his face. And when he is sad, he clings to his mother and does not leave her side. He always holds his towel, serving as his 'security' and acts undisturbed by his surroundings. He follows instructions only through his mother.

Participant C does things on his own, enjoys listening to music on his cellphone through an earphone. At times he makes fun of the other children in the program and likes to tease his fellow participants. He does not readily abide by any instructions given to him and wants to keep on roaming around the vicinity alone.

Participant D only gives her attention to people whom she is familiar with, bosses everyone, and tends to raise her voice if not being followed on what she likes for others to do. She wants to be the focus of attention and gets easily irritated on matters to her dislike.

The participant's reactions and behavior towards others were observed during the conduct of the activities in the Nature Walk Program. These are the following:

The changes in the participants' emotional behavior upon exposure was evident through their facial expressions as they proceeded with the activities during the interventions. As seen from the start of the first session, all children were displaying worried expressions. But as the intervention program went further (after two weekends), and with the aid of facilitation, the children were becoming excited. In every intervention activity, the children displayed an enthusiastic attitude, especially when they look for species of plants and birds. According to the guardian of participant A, the child becomes excited every time he learns that they will attend a session. Participant B display his eagerness to join by waking up earlier than usual, getting ready by himself, and even choosing his clothes to wear. Participant C hurries his guardians to move out of their house and always asks his mother when the day is to meet his friends. Participant D prepares her clothes and always makes sure that she is ready with it a night before the day of the activity. It was noted that all of them display an eagerness to be with the facilitators in the research sites. And every time they arrive at the meeting place will immediately smile upon seeing the team.

During the sessions, the participants display their interest in the newfound things in the intervention sites. They were very stern to know about the things they found and kept on asking about it, may it be through words, hand signals and for one participant, he will continuously look at a member of the team until he is given attention. The participants' attitude towards the other member of the group has developed into being distant and not caring to become fond of and being responsible towards each other. The children's change in attitude towards each other has been observed immediately upon the introduction of the intervention. Due to the limitation of time, the participants long for additional sessions; it will also lead to the children displaying sadness when they learn that the activity is finished.

The social aspect has become distinct in the second session of the intervention. In the initial phases of the intervention program, the children have been observed as aloof with each other. They just do whatever they are asked and did not have a closer interaction. As they display shyness, they tend to do their activities separately. According to their guardians, it was because they are not classmates, and they belong to different groups at school and never that they engage themselves together in any activity. But as the program proceeded, after two separate sessions, the children have developed camaraderie and, as such, have learned to work together. The AU cases have learned to mingle with those with DS and started calling each other's names.

The children developed a sense of belonging to a group. It was evidenced by calling out to each other and staying together even during their free time in school. This occurrence was reported by their guardians. Some children in the program have developed a sense of awareness of the people in their surroundings (mostly neighbors). Participant A started to be friendly and mimic the greetings that have been taught and shown to them during the sessions. Participant B started smiling with his father's workmates every time they ask him what he did during his nature walks. Participant C's conduct towards the other members of the family changed considerably and started to reach out towards them, making the activities in the intervention sessions an excuse for small conversations. Participant D became friendlier with her older sister and tells stories about their activity with the research team. Their sense of attachment to the facilitators became prominent and became friendly towards other people as the intervention sessions progress. The observation in the changes in social attitude became more prominent after the second session. An example of these changes was their immediate compliance as a group in performing the task given to them in the duration of the activities during the third session. According to the guardian of Participant B, he continuously mentions the names of the facilitators in his stories to other members of their family during dinner time.

During the initial intervention, the participants went to a site that would let them walk for at least a kilometer (km) on trails. Occasionally the group will stop for an inspection of the ground and the plants. Rest took place every 100 meters or less, depending on the participant's capabilities. During the first two sessions, the walks take long to be completed, because the participants are distracted, and they tend to complain of tiredness. But during the succeeding sessions, they displayed endurance on the walks and the time for every activity became more extended, as the participants are already craving for more time at the trails on the sites. They experienced enjoyment from the programmed activities and do not complain of being tired. Instead, after the sessions, the participants who can communicate will always ask when is the next meeting.

The physical condition among the participants has been limited to having a relaxed state and could keep their energy to communicate while performing the activities. As a result, the children do not have physical discomfort associated with their medical condition. All participants in the study have energy during the activity and after which they were tired but very relaxed. Some of them take a casual nap after the exercises, which were manifested during their travel while riding the car going back to their homes.

The observed changes in the participants' mental ability made a significant impact on the results of the study. The memory game devised for the research has brought valuable information regarding their ability to recall. All the participants were able to remember the essential things they encountered- from the trees, flowers, animals, mountains, people, and birds seen from most visited sites. They often compare notes, every time we ask them to identify the pictures shown to them. They help each other out, especially Participant C, who seems to have developed an attitude during the program. He keeps on answering for his co-participants. Another fact on the improvement of their mental capability is their ability to recite to a higher number when counting the plants, flowers, and any materials found on the sites-this is specifically observed with Participant A whose counting ability went beyond his usual number. A similar report was also told by their classroom teacher at their school, and when asked about it, Participant D mentioned the flowers she counted during the sessions. Participant B became aware of the birds and flowers in their backyard and started pointing and mentioning the names of those he sees to other members of the family. According to his mother, every time he sees a bird perched on the plant in their backyard he will immediately jump up and down. Participant A recited the name of the flowers and shape of the leaves and the constant mention of the names of the research team during his conversation with another member of his family.

It was also worth noting that the children have developed an 'inquiring mind,' where some of the children (participants C and D particularly) will always ask about anything they find during the activities. This behavior became prominent in every intervention session. Their awareness of their surroundings, especially if they saw or hear something similar from their experience during the intervention sessions, was also reported by their guardians during their family trips.

4. Discussion and Conclusion

The study found out that the intervention brought behavioral changes in the children. Manifested thru their ability to convey what they feel. This is by way of facial expressions, display of attitude during the sessions, and their guardians report. Their show of excitement every time they knew that the group would meet for activities and other significant changes in attitude at home and school were also notable. These findings make similar statements (Alter, 2013; Pretty et al., 2005; Kirkby, 1989) regarding the use of the natural environment on behavior. Wherein utilizing the natural environment, increasingly well established that the natural and constructed features of the environment affect emotional, mental state, and social relationships (Wolf and Flora, 2010; Frumkin, 2001; Hayashi et al., 1999; Lewis and Booth, 1994;). Various Activities in the program facilitates, the inclusion of different types of conditions against a regular school curriculum which differentiates children with disability. Through the activities, the children find it as an avenue to express themselves. It paved the way for the children to show their affection towards their co-participant, other members of the family and other individuals outside of their family. By performing tasks instructed to them, the children even though having physical challenges but do not show difficulty due to their excitement towards the activities. Similar results were also found in studies using the natural environment as an intervention (Bjorge et al., 2017; O'Brien, 2009), where there are improvements in the children's self-confidence, motivation and concentration, communication, and physical skills. Of course, the changes seen take time to occur for the cases in this study. Putting importance on the need for frequency of visits and activities with the natural environment. Because of the design of the activities in the program catered for the participants, they find it amusing, thereby, do not mind being outdoors for a specified period.

It was also worth noting that the children have displayed the liking not only of the activities but also towards the research team. This finding made a firm stance that the role and attitude of the facilitator are as important as the tool for intervention (Cranley et al. 2017). Hence, they will only submit themselves upon recognizing the facilitators' ability or knowledge, behavior to handle such a program and attitude towards under her or his care (Baraldi and Farini, 2013; Petrova et al. 2010). The role of the facilitator in this study gear towards innovation and the ability to influence and link gaps between the school setting and other factors, notwithstanding the ability to learn everything about those under her care. The attitude of the facilitator goes beyond the knowledge and implementation of the program, but also to the outside stakeholders who can make changes in the program.

The study was limited in the number of participants due to the guardian's approval for the participation of their wards. The locations were pre-arranged based on the participants' physical ability. Logistics was limited because of limited funding, but it was successful in bringing out the results mentioned above. It may not speak of the general population for cases such as the conditions of the participants, still, it could give a significant contribution to the academic discourse.

The success of the program does not only entail the design of activities but also spans from the selection of the site for intervention to the logistics and travel, organizing, and linkages established beforehand, the cooperation of the guardians of the children. With the results seen from the study, it can say that support is necessary for these types of programs, especially that it is not common in the regular educational setting in the country. This study therefore highly recommends that there will be a possible adaptation of the Nature Walk Program for educational purposes as well as for intervention purposes in the school setting for children with learning disabilities as the need arises.

Acknowledgment:
The author wishes to acknowledge the assistance of Professor Alberto Dimarucut and Professor Gilda L. Uy in the conceptualization of this paper. To the Administrator and teachers of the Special Education Center Baguio who gave their permission to conduct the initial stages of the research in their school. To the parents and guardians of the children who gave their valuable time and assistance to the research team in providing valuable data. Also, accompanying their children and the research team in the study sites and making sure that the intervention program for their children in the form of this research endeavor will always happen. To the stakeholders, government agencies who permitted to conduct the study in the selected sites, this study would not happen with all their assistance.

References

Alter, A. (2013) How Nature Resets Our Minds and Bodies. Drunk Tank Pink and Other Unexpected Forces That Shape How We Think, Feel, And Behave. Copyright © 2017 by the Atlantic monthly group. All Rights Reserved. Available at www.theatlantic.html

Abera M., J. Robbins, and M. Tesfaye (2015) Parents' Perception of Child and Adolescent Mental Health Problems and Their Choice of Treatment Option in Southwest Ethiopia. *Child Adolescence Psychiatry Mental Health*. 2015; 9: 40. https://doi.org/10.1186/s13034-015-0072-5

Baraldi C., Farini F. (2013) Trust and Facilitation in Educational Interactions. In Warming H. (Eds) Participation, Citizenship and Trust in Children's Lives. *Studies in Childhood and Youth. Palgrave* Macmillan, London Pp. 132-153. DOI: 10.1057/9781137295781_8

Bjorge S., T. Hannah, P. Rekstad, and T. Pauly (2017). The Behavioral Effects of Learning Outdoors. https://sophia.stkate.edu/maed/232

Borg G. (1982) Psychophysical Bases of Perceived Exertion. Medicine In Science And Sports and Exercise. Vol. 14 No. 5 pp. 377-381

Burns N. and Groove S. (2001) *The Practice of Nursing Research: Critique, Conduct and Utilization* 4th Edition W.B. Saunders Company ISBN 0-7216-9177-3

Bright Tots, (2017) Educational Toys & Resource Guide to Child Development. all rights reserved. Copyright © 2004-2017 Bright Tots, Inc. Educational Toys & Resource
Guide to Child Development. www.worldofautism.com

Coon, J.T., K. Boddy†K. Stein, R. Whear, J. Barton, M., and H. Depledge (2011). Does Participating in Physical Activity In Outdoor Natural Environments Have A Greater Effect On Physical And Mental Wellbeing Than Physical Activity Indoors? https://pubs.acs.org/doi/abs/10.1021/es102947t

Cranley L. G., J. Cummings, P. McGrath, F. Toth, and C. Estabrooks (2017) Facilitation Roles And Characteristics Associated with Research Use by Healthcare Professionals: A Scoping Review. *BMJ Open* 2017;7: e014384. DOI: 10.1136/bmjopen-2016-014384

Doyle, C. (2018). *A New Family Systems Therapeutic Approach for Parents And Families of Sexual Minority Youth.* Issues in Law & Medicine, 33(2), 223. https://search.proquest.com/docview/2249001028?pq-origsite=gscholar&fromopenview=true

Diamond A, Lee K. Interventions Shown to Aid Executive Function Development in Children 4 To 12 Years Old. Science. 2011 Aug 19;333(6045):959-64. DOI: 10.1126/science.1204529. PMID: 21852486; PMCID: PMC3159917.

Floresca, J. (2015) Bird Watching as A Recreation and Nature Activity in Baguio City and Nearby Municipalities of Benguet Province Philippines: A Conservation Effort. *Asian Journal of Applied Sciences* http://www.ajouronline.com/index.php?journal

Floresca, J. (2019) Nature Walk Program as Means of Reconnecting with The Natural Environment: An Alternative Physical Education. *Education Quarterly Reviews* ISSN 2621-579, https://www.asianinstituteofresearch.org

Frumkin, H. (2001). Beyond Toxicity. Human Health and The Natural Environment. *am j prev m*ed 2(3):47 – 53. *Guidelines for The Identification and Management of Lead* (n.d.). https://www.health.ny.gov/publications/2501/

Hanscom A. (2014) |Nature is the ultimate sensory experience: a pediatric occupational therapist makes the case for nature therapy. www.childrenandnature.org/

Harris, F. (2017) outdoor learning spaces: the case of forest school. *wileyonlinelibrary.com/journal/area. Area*. 2018; 50:222–231 https://rgs ibg.onlinelibrary.wiley.com/doi/pdf/10.1111/area.12360

Heart Online, (2014). Rating of Perceived Exertion: Borg scales –. www.heartonline.org.au/media/DRL/Rating_of_perceived_exertion_ pdf

Heiman, S. (2014). A Study on The Perception of Brain Games and Their Effect on Memory and Cognitive Skills. University of Central Florida. https://pdfs.semanticscholar.org/8f16/ff43ab487b60f1e2dfe447940e8d31b2dc90.pdf

Kirkby, M. (1989). Nature as Refuge in Children's Environments. *Children's Environments Quarterly* 6:7-12

Lam, S. (2018). Forest School Teaches Preschoolers Outdoor Risks and Catches On in Hong Kong. South China morning post Available at https://www.scmp.com/news/hong-kong/education/article/2140536/

Maynard, T. (2007). Forest schools in Great Britain: an initial exploration. *Research* article https://Doi.Org/10.2304/Ciec.2007.8.4.320

Nock, M. and Photos, K. (2006) Parent Motivation to Participate in Treatment: Assessment and Prediction of Subsequent Participation. *Journal of Child and Family Studies.* Volume 15, Issue 3, pp 333–346 | https://doi.org/10.1007/s10826-006-9022-4

O'Brien, L. (2009) Learning Outdoors: The Forest School Approach', *Education 3-13*,37:1,45-60. doi: 10.1080/03004270802291798url: http://dx.doi.org/10.1080/0300427080229179

O' Brien L. and Murray R. (2007) forest School and Its Impacts on Young Children: Case Studies in Britain. *Article in Urban Forestry & Urban Greening* 6(4):249-265 · DOI: 10.1016/j.ufug.2007.03.006

Peacock, A. and Pratt, N. (2011). How Young People Respond to Learning Spaces Outside School: A Sociocultural Perspective. *Learning Environments Research*, 14, 11–24. https://www.researchgate.net/publication/226165683

Petrenko, C. (2013) A Review of Intervention Programs to Prevent and Treat Behavioral Problems in Young Children with Developmental Disabilities. n. DOI: 10.1007/s10882-013-9336-2 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3821779/

Pretty J., J. Barton, M. Sellens, and M. Griff. (2005) The Mental and Physical Health Outcomes Of Green Exercise, A Countryside For Health And Well-Being: The Physical And Mental Health Benefits Of Green Exercise. Sheffield: Countryside *Recreation Network International Journal of Environmental Health Research*, 15:5, 319-337, DOI: 10.1080/09603120500155963

Pretty J., M. Griffin, M. Sellens and C, Pre. (. 2003). Green Exercise: Complementary Roles of Nature, Exercise and Diet In Physical And Emotional Well-Being And Implications For Public Health Policy. Ces *Occasional Paper 2003* – 1. Colchester: University of Essex. Https://www.Researchgate.Net/Publication/237471176_

Scully D., J. Kremer, M. M. Meade, R. Graham, and K. Dudgeon (1999). Physical Exercise and Psychological Well-Being: A Critical Review. British Journal of Sports Science 32:11 – 20. DOI: 10.1136/bjsm.32.2.111

Smith GE, Housen P, Yaffe K, Ruff R, Kennison RF, Mahncke and HW, Zelinski EM. (2009). A Cognitive Training Program Based on Principles of Brain Plasticity: Results From The Improvement In Memory With Plasticity-Based Adaptive Cognitive Training (Impact) Study. J Am Geriatr Soc., 57(4): 57(4):594-603. DOI:10.1111/j.1532-5415.2008.02167. x. Available at https://www.ncbi.nlm.nih.gov/pubmed/19220558

Tonge, B. (207). The Psychopathology of Children with Intellectual Disabilities. In: Bouras N, Holt G, editors. *Psychiatric and behavioral disorders in intellectual and developmental disabilities*. 2. New York: Cambridge University Press; 2007. Pp. 93–112.

Williams, N. (2017). The Borg Rating of Perceived Exertion (RPE) scale. *Occupational Medicine,* Volume 67, Issue 5, July 2017, Pages 404–405, https://doi.org/10.1093/occmed/kqx063

Wolf, K.L., and K. Flora (2010). Mental Health And Function - A Literature Review. In Green Cities: Good Health College of The Environment, University of Washington. www.greenhealth.washington.edu