Mahidol University
Ratchasuda College

The 7th Ratchasuda Virtual International Conference on Disability 2021

INCLUSION FUTURES :
POLICIES, PRACTICES
AND FUNDING

FRIDAY JUNE 25th 2021

ONLINE WEBINAR

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Welcome Remarks from the President of Mahidol University

Prof. Banchong Mahaisavariya, M.D.

Excellencies, Distinguished Delegates, Ladies and Gentlemen

It gives me immense pleasure to extend a warm welcome to you all to the *Seventh Ratchasuda Virtual International Conference on Disability 2021*. Mahidol University has been promoting social inclusion and quality of life in persons with disability for over 133 years since the establishment of "Siriraj Hospital" in 1888, then developed to Mahidol University in 1969. Nowadays, there are many hospitals, faculties, colleges, and institutes under affiliation of Mahidol University working collaboratively to support the persons with disability both in medical and social aspects, particularly Ratchasuda College, that has been taking direct responsibility for promoting education, academic services, rehabilitation, research, and innovation to enhance the quality of life in persons with disability for over 30 years.

Ratchasuda international conference on disability is one of remarkable even organized by Ratchasuda College. This conference is one of the learning community on disability and special needs which can bring researchers, scholars, and participants across the world to contribute and share their experiences and diverse perspectives in order to build and expand the knowledge on disability and persons with disability.

This year's conference theme *"Inclusion Futures: Policies, Practices and Funding*" challenges participants who are working in Inclusion career to share their experiences with peers in order to promote academic collaborations of Inclusion for persons with disability in the worldwide. The terms of "Inclusion" is one of key principles of the Sustainable Development Goals (SDGs) to reduce the global challenges of

inequality for all people in society, especially in SDGs 4 which focus on ensuring inclusive and equitable quality education. Mahidol university has been promoting this goal to create inclusive and equitable education for all students, particularly the students with disability or significant needs who are included in various programs both in undergraduate and graduate levels. We provide accommodations and supports for the students to overcome the barriers to accessing education and learning environments inside and outside the classroom. We aim that all students can reach their highest academic potential and succeed in their learning. I believe that the benefits of successful inclusion are numerous, not only for the students with disabilities and their families but also for all students, teachers, administrators, and other staffs to learn acceptance, respect, and harmony for diversity in our community.

This year's conference has changed to virtual platform due to the COVID-19 pandemic that has required social distancing to help prevent the spread of the virus. However, I believe that all participants will benefit from many experts and scholars sharing on various topics throughout online platform. I would like to express my wholehearted thanks to all participants for attending, collaborating, and supporting this conference.

Finally, I hope that this conference will give you a great opportunity to exchange the knowledge and experiences in order to create the successful inclusion and to enhance the quality of life for all.

May you enjoy this very valuable conference.

Welcome Remarks from the Dean of Ratchasuda College, Mahidol University

Wachara Riewpaiboon,
M.D., MSc., Dip. Thai Board of Rehabilitation Medicine

Honorable Guests, Distinguished Delegates, Ladies and Gentlemen

On behalf of Ratchasuda College, it is our great pleasure to warmly welcome you to **the 7th Ratchasuda Virtual International Conference on Disability 2021.** This College was established in accordance with the generous mercy of Her Royal Highness Princess Maha Chakri Sirindhorn who dedicates her life to enhance quality of life of persons with disabilities**.** According to the college's missions, higher education and academic services have been provided to persons with disabilities, rehabilitation professionals, and educators for over 30 years**.** Whereas knowledge production to serve as the wisdom for all has increasingly been addressed.

The College also aims to extend the learning and sharing spaces across nations and cultures among those who are interested and working on disability- related areas for quality of life development and empowering people with disabilities. To serve this purpose Ratchasuda International Conference on Disability has been continually annually operated for 7 years ago. Besides this kind of meeting, the other ways of collaborations would also be expected such as exchanges of visiting professors and students, as well as the particular collaborative researches.

"Inclusion Futures: Policies, Practices and Funding", the theme of this year conference addressing five significant areas to promote inclusion persons with disabilities naming; education, environment, technology, society, and policy. Inclusion is well recognized as the critical principle regarding the UN

Convention on the Rights of Persons with Disabilities (CRPD), as well as the Disability-inclusive Sustainable Development Goals (SDGs). In this regard, equal rights and opportunities, accessibility and non-discrimination need to be explicitly practiced particularly in education areas.

For your information, we would like to inform that there were many issues of our interests which been in operation and wish to have broader collaboration with all of you, for instance, 1) the development of competency-based Bachelor degree curriculum and flexible education program for persons with disabilities; 2) human resource development to provide services for people with disabilities including teacher, Thai SL interpreter, and other rehabilitation professionals; 3) the development of rehabilitation service model such as orientation and mobility training for the blind and low vision persons, and 4) the research and development on assistive technology for better access to information and learning of people with disabilities.

This year conference, we are very honored to have Professor Dr. Chang, Heng-Hao from National Taiwan University to give a keynote speech. Moreover, there will be Associate Professor Dr. Mandia Mentis, Dr. Wendy Holley-Boen, Dr. Lucila Carvalho, and Ms. Malia Iona Tuala to share their great experiences on the panel discussion.

According to COVID-19 pandemic, the conference was then virtually arranged which I believe that all participants will gain valuable knowledges and experiences from our speaker, panelists, and all presenters. Finally, I would like to thanks all of you for your participation and kindly support our learning platform and to jointly promote inclusive society for all particular in education areas.

May you enjoy the conference, please.

Editorial Board

The Ratchasuda College, Mahidol University organized the 7th Ratchasuda Virtual International Conference on Disability in 2021 with the theme *"Inclusion Futures: Policies, Practices and Funding*" in order to promote inclusive society and sustainable living for all. This publication has been prepared to publish the proceedings of the conference at international standards related to disability and persons with disabilities.

Ratchasuda College, Mahidol University June 2021
111 Moo 6 Salaya, Putthamonthol District, Nakhon Pathom 73170 Thailand

The 7th Ratchasuda Virtual International Conference on Disability 2021
Inclusion Futures: Policies, Practices and Funding
25th June 2021 (Via Webinar)
Organized by Ratchasuda College, Mahidol University

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Program Agenda

Friday 25th June 2021

Time	Program	Venue
8.30 a.m.	Registration	
9.00 a.m. – 9.30 a.m.	- Opening Ceremony - VDO Presentation - Welcome Speech: Wachara Riewpaiboon, M.D., MSc., Dean of Ratchasuda College, Mahidol University - Opening Speech: Associate Professor Thanya Subhadrabandhu, M.D. Vice President, Mahidol University	Webinar
9.30 a.m. – 10.30 a.m.	Keynote Speech "Inclusive Education for All: Reflections on Citizenship and CRPD" Professor Chang Heng-Hao, Ph.D., National Taipei University, Taiwan	Webinar
10.30 a.m. – 10.45 a.m.	Refreshment	
10.45 a.m. – 12.00 p.m.	Panel Discussion “Living and Learning in a Digital World: Equity & Inclusion” - Associate Professor Mandia Mentis, Ph.D. - Dr. Wendy Holley-Boen - Dr. Lucila Carvalho - Ms. Malia Iona Tuala Massey University, New Zealand	Webinar
12.00 p.m. – 13.00 p.m.	Luncheon	
13.00 p.m. – 15.30 p.m.	Oral Presentation	Webinar
15.30 p.m. – 16.00 p.m.	- Papers Awarding Ceremony - Closing Ceremony	Webinar

Remark: 1. Thai/ English Interpretation and Thai Sign Language interpretation will be available throughout the conference
2. The program can be flexible

Keynote Speaker

Professor Chang, Heng-hao, Ph.D.

Department of Sociology, National Taipei University
EMAIL: henghaoc@gmail.com, henghaoc@mail.ntpu.edu.tw

Panelists

Associate Professor Mandia Mentis, Ph.D.

Massey University, New Zealand
EMAIL: m.mentis@massey.ac.nz

Dr. Wendy Holley-Boen

Massey University, New Zealand
EMAIL: w.holley-boen@massey.ac.nz

Dr. Lucila Carvalho

Massey University, New Zealand
EMAIL: l.carvalho@massey.ac.nz

Ms. Malia Iona Tuala

Massey University, New Zealand
EMAIL: mtuala19@gmail.com

Reviewers

1. Associate Professor Joseph Seyram Agbenyega, Ph.D.	Emirates College for Advanced Education, Abu Dhabi
2. Associate Professor Tavee Cheausuwantavee, Ph.D.	Ratchasuda College, Mahidol University
3. Assistant Professor Piyarat Nuchpongsai, Ph.D.	Ratchasuda College, Mahidol University
4. Assistant Professor Natee Chiengchana, Ph.D.	Ratchasuda College, Mahidol University
5. Issavara Sirirungruang, Ph.D.	Ratchasuda College, Mahidol University
6. Wiraman Niyomphol, Ph.D.	Ratchasuda College, Mahidol University
7. Parinya Siriattakul, Ph.D.	Ratchasuda College, Mahidol University
8. Sunanta Klibthong, Ph.D.	Ratchasuda College, Mahidol University

List of Papers for Oral Presentation

No.	Presenter(s)	Title	Type
1	Tsutomu Araki, Haihan Liu, Mingfu Cui, Yuko Shiraki, Jin Tatsuoka, Kazuko Akaishi, Kazuki Kanbe, Maho Okada	Students' Self-evaluation and Progress in Various Forms of Learning -- Towards a Shining Tomorrow for Everyone Through Practical Education	**Abstract**
2	Natwipa Wanicharoen	Quality of Life among Caregivers of Children with Language Impairment at the Division of Developmental and Behavioral Paediatrics Faculty of Medicine Vajira Hospital: a Cross-Sectional Descriptive Study	
3	Waiyawut Wuthiastasarn	Warm or Cold color? The suitable colored background for Thai sign language on TV screen	**Full paper**
4	Vichita Chaovanajinda, Issavara Sirirungruang, Wiraman Niyomphol	The Development of English Braille Literacy for the Students with Visual Impairment by Using an Activity-based Learning Method	
5	Shigeo HIRANO, Susumu KISE, Sozo SEKIGUCHI, Kazuya OKUSAKA, Tsutomu ARAKI	History of research and development of the finger joint rehabilitation device in Japan in the past decade	
6	Jan Jade N. Tabasa, Nilda B. Delgado, Diana Grace S. Ariz	An Ethnographic Study on Socio-Emotional Learning Program under the COVID-19 Pandemic: Teachers' Perspective	

Students' Self-evaluation and Progress in Various Forms of Learning -- Towards a Shining Tomorrow for Everyone through Practical Education

Tsutomu Araki[1], Haihan Liu[2], Mingfu Cui[2], Yūko Shiraki[3],

Jin Tatsuoka[3], Kazuko Akaishi[3], Kazuki Kanbe[3] and Maho Okada[3]

[1]Professor emeritus, [2]Lecturer, [3]Teacher

[1]Tsukuba University of Technology, 4-3-15 Amakubo, Tsukuba City, 305-8520, Japan
[2]Changchun University Special Education School, 6543 Weixing Road, Changchun City, 130022, China
[3]Watarase Special Support School, 2812 Shika Kasakakecho, Midori City, 379-2313, Japan

[1]tutaraki@yahoo.co.jp, [2]252854554@qq.com, [3]watatoku-snes@edu-g.gsn.ed.jp

[1]*www.tsukuba-tech.ac.jp,* [2]*www.cdtjxy.ccu.edu.cn,* [3]*www.watayo-ses.gsn.ed.jp*

ABSTRACT

Since its establishment, I taught in the Mechanical Engineering Department of Tsukuba University of Technology, the only university for the visually and hearing impaired in Japan. In classes, many 2D and 3D CAD teaching methods had been created and adopted, in which students self-evaluate individual tasks, learning through their own drawings and modeling.

In the "Exercise in Fundamentals of CAD" class, as a practice of 2D-CAD operation method, students learn Optimization by competing for flight distance under the theme "Making a Paper Plane". They also bring their own airplane drawings to an event in Tsukuba City and experience teaching in a workshop (social contribution: the first step to society). They make a mini stamp to practice 3D-CAD operation and experience modeling. In the "Exercises on Machine Design and Drawing" class, the shape is confirmed by comparing the drawn 2D drawing with the 3D model. The aim is to join a competitive "Paper Car Race" with Special Education College of Changchun University in China. The event, in which both presidents participate, makes effective use of video conferencing and brings about effective international exchange.

After retirement, I returned to my hometown and encountered the students' work training practice in the rich environment of Prefectural Watarase Special Support School. The work of environmental conservation by students, under the guidance of teachers, is appreciated by local people. The evaluation takes the form of an exchange of greetings and words of gratitude among those living in the area, quite different from the self-evaluation experience of Mechanical Engineering students.

I will introduce the efforts of university and special support school students in self-improvement through evaluation of their own learning. I believe an important part of education includes cultivating sociality to optimize the results of Student Self-evaluation.

Keywords: Hearing Impairment, Student Self-evaluation, Paper Car, Self-improvement, Social contribution, Optimization, Video Conferencing

Quality of Life among Caregivers of Children with Language Impairment at the Division of Developmental and Behavioral Paediatrics Faculty of Medicine Vajira Hospital: A Cross-Sectional Descriptive Study

Natwipa Wanicharoen B.Sc., M.A.[1*]

[1]Child Development and Adolescent Unit, Pediatric Department,
Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand
n.a.v.y@live.com

ABSTRACT

To explore the quality of life (QoL) and to investigate factors associated with QoL among caregivers of children with language impairment (LI). This study design was a cross-sectional descriptive study. The participants in this study were the caregivers of children with LI including specific language impairment (SLI), global developmental delay (GDD), autistic spectrum disorder (ASD), down syndrome (DS), and intellectual disability (ID), aged 2-7 years attended Child development and adolescent unit, Faculty of Medicine Vajira Hospital between November 2019 and October 2020 by using a questionnaire for the general data and the World Health Organization Quality of Life Brief – Thai (WHOQOL-BREF-THAI). Data were analyzed using the descriptive and inferential statistics. Most of the caregivers were female (84%) with mean age of 38.06±10.67 years old. Most of them were mother (65%), being housewives/husbands (33%), and having monthly income ≤15,000 (40%). Most children were male (59%) with mean age of 3.96 ± 1.72 years old.

Most of them were diagnosed with SLI (40%). The overall QoL, physical, and psychological aspects among caregivers of children with LI were at high levels, accounting for 51%, 51% and 54% of the sample respectively. While the QoL in the social relationships and environment aspects were at moderate levels, at 51% and 68% respectively. Factors associated with QoL were the gender of caregivers and self help in daily activity of children.

Children with LI may affect their caregivers' QoL, especially in the social relationships and environment aspects. These findings provide new insights into QoL of caregivers of children with LI that may be important when professionals consider comprehensive intervention and more specific support to improve their situation. It is expected that if caregivers' QoL improves, they would provide greater parental care, which will further improve their children's well-being.

Keywords: quality of life, caregivers, language impairment

Warm or Cold Color? The Suitable Colored Background for Thai Sign Language on TV Screen

Waiyawut Wuthiastasarn [1]

[1]Instructor

[1] Faculty of Mass Communication Technology,
Rajamangala University of Technology Thanyaburi,
39 Moo 1 Rangsit – Nakornnayok Road, Klongluang, Pathumthani, Thailand
[1]*waiyawut_w@rmutt.ac.th*
[1]*www.mct.rmutt.ac.th*

ABSTRACT

The purpose of study was to examine use of different background colors for the appropriateness of watching TV program from the hearing impairments. This research was a quasi-experimental; one group posttest only design using a sample of 50 high school deaf students at Setsatian School for the deaf. There was 2 groups of 25 male and 25 female that watched the treatment a TV program, a daily weather forecast with a Thai sign language interpreter on the 6 background colors; purple, blue, green, yellow, orange and red. Colors appear closer to the red were warm while closer to the blue were cold. The suitability of background with sign language interpreters were collected. The collecting data processed and tested the hypothesis in a SPSS for Window, the chi squared test of statistics were used and the p – value less than 0.05 was accepted the alternative hypothesis.

The result showed the satisfaction in background of a sign language interpreter on the TV screen in the first choice of cold color was selected 56 % by male and 72% by female. The total average was 64%. The second choices decreased by 42% and the third choices decreased by 28 %. The first choice of warm color was selected 44 % by male and 28% by female. The total average was 36%. The second choices increased by 58% and the third choices increased by 72 %. The test of Chi – Square statistics showed that no different of the first, second and third selection of color tones. This result found that no different between the cold color and the warm color was selected.

Keywords: colored background, Thai sign language interpreter, TV screen, hearing impairments

1. INTRODUCTION

Thailand has laws Section 36 of the Broadcasting and Television Business Act B.E. 2551 requires the promotion and protection of the rights of disabled and disadvantaged people to access or recognize and take advantage of the television programs. Broadcasting and television businesses are equality with the general public. The announcement made by the National Broadcasting and Telecommunications Commission B.E. 2559. By the National Broadcasting and Telecommunications Commission (NBTC) to promote the protection of the rights of people with disabilities. For sign language interpretations studies have shown that people with hearing

disabilities prefer to choose sign language interpreter services more than closed captions because of the cultural reasons of deaf people, even if subtitles are provided instead of voices. Deaf and hearing impaired people in each country are often comfortable using sign language interpreters because of its familiarity in the deaf communities. (Qure, J. and Quardros, R., 2015, p. 120 -145.)

TV programs contain a lot of information such as hosts, participants, are called the environment in which the program is presented, so it is necessary to determine the size of the display sign language interpreters. The screen frame used to display sign language interpreters is defined as 1of 12 TV screens or more. Federal Communications Commission (FCC) of the United States, or The Office of Communications (ofcom) of the United Kingdom, has not specifically addressed this issue. The present study showed that in European countries, there were 100 different screen designs used to display sign language interpreters, such as interpreter's on-screen size. Different shot sizes are used, including the interpreter's location on the screen. (Bosch-Baliarda, Marta, et al. 2020, pp. 1 - 23) But another important thing is the color of the background as it is an area that needs to be watched, the color of the background must be appropriate. Otherwise, the color of the background may interfere sign language by interpreters. Therefore, the recommended background color should be dark blue, dark gray, dark brown, or dark blue. That were for tv service. (NBTC, [online]) However, there is no research to support what color is suitable for displaying Thai sign language on a TV screen. The research about Thailand media accessibilities reported about the effective promotion on communication technology did not develop the quality of lives of persons with disability. (Bunchuea, Tri and Bunchuea, Kirati, 2016, p. 212.)

2. METHODOLOGY/MAIN CONTENT

This study aimed to use suitable colored background for Thai sign language on TV screen. It was intended to test the color for the suitability of watching TV program with sign language interpreters. This is quantitative research using quasi-experimental one group posttest only design by comparing satisfaction in TV shows with sign language interpreters. The sign language interpreter’s background consisted of cold color and warm color. The cold color were purple, blue, green and the warm color were yellow, orange, and red. The population used in this study was high school deaf students. The sample must be deaf with a hearing level of 90 decibels or more and they were normal eyesight, with 50 persons. Participants were divided into 25 male and 25 female. They selected the first color that the most suitable color, the second selected color, and the third selected color that the least suitable color and then the data analyzed with the SPSS.

Figure1. The task of participants

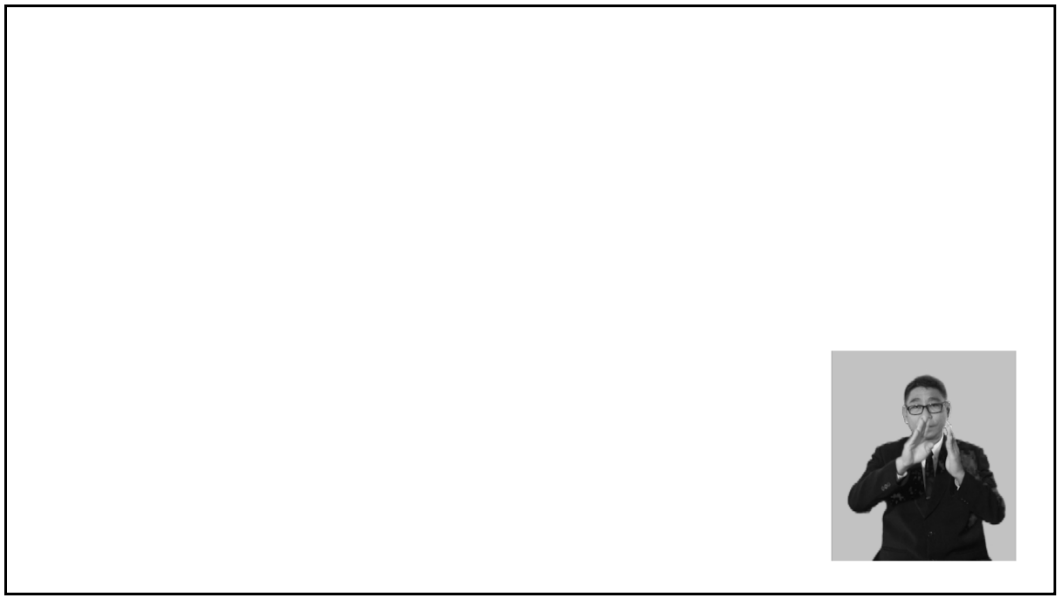

Figure2. The sign language interpreter with background color

3. RESULTS AND DISCUSSIONS

The selecting the most suitable color of the background showed that in the Table 1. The participants selected a cold color 32 people were represented 64% compared to 18 people who selected warm color were represented 36%. The male selected cold color 14 people were represented 56% compared to 11 people who selected warm color were represented 44%. The female 18 people selected cold color were represented 72% compared to 7 people who selected warm color were representing 28%.

Table 1. First selected the color of background

First selected			Colored Background		total
			Warm color	Cold color	
Sex	Male	Number of	11	14	25
		Percentage of	44.0%	56.0%	100.0%
	Female	Number of	7	18	25
		Percentage of	28.0%	72.0%	100.0%
Include		Number of	18	32	50
		Percentage of	36.0%	64.0%	100.0%

The participants selected a cold color 21 people were represented 42% compared to 29 people who selected warm color were represented 56%. The male selected cold color 10 people were represented 40% compared to 15 people who selected warm color were represented 60%. The female 11 people selected cold color were represented 44% compared to 14 people who selected warm color were represented 56%. (see the table 2.)

Table 2. Second selected the color of background

Second selected			Colored Background		total
			Warn color	Cold color	
Sex	Male	Number of	15	10	25
		Percentage of	60.0%	40.0%	100.0%
	Female	Number of	14	11	25
		Percentage of	56.0%	44.0%	100.0%
Include		Number of	29	21	50
		Percentage of	58.0%	42.0%	100.0%

The participants selected a cold color 14 people were represented 28% compared to 36 people who selected warm color were represented 72%. The male selected cold color 6 people were represented 24% compared to 19 people who selected warm color were represented 76%. Female 8 people selected cold color were represented 32% compared to 17 people who selected warm color were represented 68%. (see table 3.)

Table 3. Third selected the color of background

Third selected			Colored Background		total
			Warm color	Cold color	
Sex	Male	Number of	19	6	25
		Percentage of	76.0%	24.0%	100.0%
	Female	Number of	17	8	25
		Percentage of	68.0%	32.0%	100.0%
Include		Number of	36	14	50
		Percentage of	72.0%	28.0%	100.0%

Based on the colored background selection display, the participants selected a cold color in the first priority colored background 64% compared to those who selected warm color 36%. The second choice of colored background, the participants selected cold color 42% and warm color 58%. The latest result of the colored background selection showed that the participants selected 72% of cold color and 28% of warm color. The results suggest that cold color were the most suitable as the background for sign language interpreters because they were selected in the first priority almost one times more than warm color. (see Table 1)

When the participants done them task. The result showed the relation between choosing the color of the background and the tones. It was found that there were no statistically significant differences. As shown in table 4 – 6.

Table 4. The test of relationship between choosing of the first color background and color tones

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.389	1	.239		
Continuity Correction	.781	1	.377		
Likelihood Ratio	1.398	1	.237		
Fisher's Exact Test				.377	.189
Linear-by-Linear Association	1.361	1	.243		
N of Valid Cases	50				

Table 5. The test of relationship between choosing of the second color background and color tones

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.082	1	.774		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.082	1	.774		
Fisher's Exact Test				1.000	.500
Linear-by-Linear Association	.080	1	.777		
N of Valid Cases	50				

Table 6. The test of relationship between choosing of the third color background and color tones

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.397	1	.529		
Continuity Correction	.099	1	.753		
Likelihood Ratio	.398	1	.528		
Fisher's Exact Test				.754	.377
Linear-by-Linear Association	.389	1	.533		
N of Valid Cases	50				

This result found that no different between the cold color and the warm color was selected. Finding were consistent with studies done by Jadhao, Anand et al. they found the relationship between color perception and memory of normal students that no significant difference about red background and blue background. (Jadhao, Anand et al.,2020) It related with the result of research from Isarida, Takeo and Isarida, Toshiko K.(2007) found a change in background colors was necessary and sufficient to produce context effects. The present research were many information including hosts, participants, and the data of weather forecast. (see Figure 3.) Then participants watched the TV screen that used to display sign language interpreters it made an environmental context to incidental information about the environment in with the focal information was processed. Then this research found that there were no statistically significant differences about the suitable of background colors. The results indicate that the colored background of sign language interpreters should be cold color or warm color.

Figure3. Environmental context with the sign language interpreter and background color

4. CONCLUSIONS

By studying the colored background suitable for displaying Thai sign language poses on TV programs. It was found no difference between the warm or cold tones of the background from the selection. However, it was noted that cold color were selected 32 times, more than warm were selected 18 times. The color of the background in the first order was therefore important to consider. By surveying the used to display sign language interpreters from TV stations in Thailand. There are many TV stations uses a blue background, such as Amarin TV station and Royal Thai Army Color TV Channel 7, but there are no warm colors as the backdrop or background for using the colored background to display sign language interpreters. Although the color avoidance is found in the background. For example, Thai PBS station and Thai TV station Channel 11 the gray background is arranged.

The future research will study about size of background color of Thai sign language interpretation. Because various background colors may have the same satisfaction. The type of TV programs is necessary to classify the characteristics of signing, how to creative and how to use Thai sign language in TV show.

5. REFERENCES

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The Development of English Braille Literacy for the Students with Visual Impairment by Using an Activity-Based Learning Method

Vichita Chaovanajinda[1], Issavara Sirirungruang[2],

Wiraman Niyomphol[3]

[1]Author (student), [2]Corresponding author (Ph.D), [3]Ph.D
[1,2,3]Ratchasuda College, Mahidol University,
Nakhon Pathom, THAILAND
[1]vichyvichita@gmail.com, [2]isvrss@gmail.com,
[3]wiraman.n@gmail.com
www.rs.mahidol.ac.th

ABSTRACT

The objectives of this classroom research were (1) to compare the English braille literacy skill of students with visual impairment before and after using the activity-based learning method and (2) to study the classroom environment of the students with visual impairment while learning by using the activity-based learning method. Fifteen grade one students from three classes were purposively selected as a sample of this research. Instruments used in collecting data were lesson plans, English braille tests, and a classroom environment observation guideline. Descriptive statistics involving means and percentages were used to analyze reading accuracy, reading speed and writing accuracy. Then, the pre-test and the post-test scores were compared using the pair sample t-test. Results showed that the English braille literacy skill of the students with visual impairment after using the activity-based learning method was higher than before using the method. It was statistically significant at 0.05 for writing accuracy. From the classroom environment observation of the students, while learning using the activity-based learning method, it was found that all students participated in activities and had good relationships with each other and with the teacher. The students could understand the activities and lessons. The activities that the students enjoyed the most were bingo game (reading activity) and braille drawing (writing activity).

Keywords: Students with Visual Impairment / Activity-based Learning Method / Braille

1. INTRODUCTION

Literacy is an ability to read and write. Literacy aids people to understand spoken words and can translate them into writings. The United Nations Educational, Scientific and Cultural Organization defines “literacy as the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts” (UNESCO, 2004, p.13). An Indian Literacy Project (2016) shows that literacy has importance at two levels - these are a national level and an individual level. At the national level, a literate population aids society’s economics and politic to be stronger. It also aids people to have better living standards

and to work efficiently. At the individual level, literacy aids people to achieve and study everything easier. For people with visual impairment; i.e., people who are blind or have low vision, literacy is also important. Early braille education is crucial to literacy (Ryles, 1996) as braille is a fundamental tool for blind people to enable independence. Braille provides a gateway to education, employment, social, and cultural inclusion (Phillips & Beesley, 2012)

Nowadays, almost all people with visual impairment learn Braille to be literate. Every school for the blind teaches Braille to students like mainstream schools teach printed letters to sighted students. Students with visual impairment use a slate and a stylus as a tool to write embossed braille dots (Cheadle, 2007). A slate and stylus is an easy, convenient, and portable tool to write Braille like a pen of sighted people. (Blake, 2003)

At the kindergarten level in the school for the blind, students are taught to memorize all braille codes. This is to prepare them for study in an elementary level so they can use braille to read braille books and write their works. For this reason, the school for the blind that the researcher is teaching provides Braille Study subject at the elementary level in order to increase the efficiency of braille reading and writing of the students. If they could read and write braille well, they would be able to focus and follow the contents of subjects such as Thai, English and Maths, not having to worry about braille. In every period of the Braille Study subject, teachers let the whole class write and read braille together, using traditional rote learning throughout the semester. With this strategy, students with visual impairment still have problems of remembering braille codes.

Since 1981, Olson and Mangold stated that activities and games provided enrichment to the traditional braille teaching to students who are braille users in pre-school level to grade 3. Moreover, Hudson (2012), a teacher of students with visual impairments, suggested some activities for teaching braille to young children on Paths to literacy for students who are blind or visually impaired to help them have fun with lessons. Thus, the researcher considers trying a different way to teach braille. Since an activity-based learning (ABL) is a methodology that emphasizes an active learning and makes students as a center of a learning process, the researcher will use activities to teach braille in the Braille Study subject.

As the researcher is an English teacher who sees the importance of braille as a foundation for students to learn English, the researcher applied the activity-based learning method for students to practice English braille alphabets. In this way, the students with visual impairment will develop and increase their efficiency of English braille literacy.

1.1 Research Objectives

The objectives of this research are as follows:

1. To compare the English braille literacy of the students with visual impairment before and after using the activity-based learning method.

2. To study the classroom environment of the students with visual impairment while they are studying by using the activity-based learning method.

1.2 Research Hypothesis

The students with visual impairment have better English braille literacy after studying by using the activity-based learning method.

2. METHODS

2.1 Participants

A purposive sampling was used to select the sample group; i.e., fifteen students with visual impairment in grade one who could read and write braille. The reason students in grade one was selected because it was the first year in an elementary level and the students started to read and write braille in every subject. Therefore, the researcher wanted to develop their reading and writing skills to increase their learning efficiency. There were three classes in grade one (with five students in each class) - class 1/1, class 1/2 and, class 1/3. Since the number of the students were quite small and the researcher would like all of them to have the same experiences in activity-based learning, all students were included in the study.

2.2 Research Instruments

2.2.1 Lesson plans

Lesson plans used in this research to plan the context and activity that were used to teach students in a period. There were eight lesson plans (four reading lesson plans and four writing lesson plans).

The reading activities that were used in four lessons were adapted from Olson and Mangold (1981) as follows:

- The letter reading game, the students read the flashcards that consisted of the letters a – j. If they could read it, they would put it in front of them. But if they could not read it, they had to give it to the friend who sat next to them. If the friend could read that card, he or she would put the card in front of him/her. When time was up who had the largest number of cards in front was the winner.
- The bingo game, the students received a bingo card that consisted of the letter k – s. All of the letters were capitalised (had dot six in front). Then, the students picked up the card of letter k-s in the box (one letter per one card). When they picked up a card, they had to read out the letter. Who had the letter that was read on the bingo card, they had to erase dot six in front of it. If the students did not have, they did not have to do anything. The student who could erase dot six of all letters in a horizontal and a vertical roll was the winner.
- The letter matching game, Each Student had to match the letter t - z that they had on the board with the letter card in a box (one card per one letter). The student who could finish first and match correctly was the winner.
- The letter counting game, each student had to count the letters a – z that the teacher instructed on their letter sheets. For example, the teacher asked; “How many letter v

in your sheet?". The student who could tell the amount of letter correctly would get a point and the student who got the highest point would be the winner.

The writing activities that were used in four lessons were braille drawings adapted from the book of braille drawing by Marie Porter (N.D.) "So What About Drawing? Instructions for Drawing Using A Braille Writer". All the drawings were done using a slate and stylus as it was a tool students with visual impairment in this study were taught to use to write braille. Each drawing focused on different English braille alphabets. The students had to write the correct braille alphabets in the specific braille cell in order to get the correct drawing.

- Drawing braille picture: Flag and wrote words flag, zone, and win. In this drawing, students practiced writing letter a, e, f, g, i, l, n, o, p, w, and z.

Figure 1 Flag. Adapted from *So What About Drawing? Instructions for Drawing Using a Braille Writer,* by Marie Porter, n.d.

- Drawing Braille picture: Heart and wrote the words heart love and you. In this drawing, students practiced writing letter a, e, h, i, l, o, r, s, t, u, v, and y.

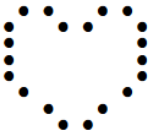

Figure 2 Heart. Adapted from *So What About Drawing? Instructions for Drawing Using a Braille Writer* by Marie Porter, n.d.

- Drawing braille picture: Spaceship and wrote the words spaceship and beam. In this drawing, students practiced writing letters a, b, c, d, e, f, h, i, m, p, q, and s.

Figure 3 Spaceship. Adapted from *So What About Drawing? Instructions for Drawing Using a Braille Writer* by Marie Porter, n.d.

- Drawing braille picture: Truck and wrote the words truck and taxi. In this drawing, students practiced writing letters a, c, e, h, i, j, k, l, p, r, s, t, u, and x.

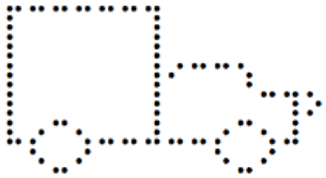

Figure 4 Truck. *Adapted from So What About Drawing? Instructions for Drawing Using a Braille Writer by Marie Porter, n.d.*

2.2.2 English braille tests

These tests included a writing test and a reading test. In the reading test, the researcher measured speed and accuracy whereas only writing accuracy was measured in the writing test. The reading test contained fifteen words (sixty-six letters). When all words were mixed, there were letter a-z in them. The students were asked to read these words one by one with the researcher by spelling out each letter in the word such as the word "acid" students had to read a-c-i-d only. They did not need to pronounce the word. If they could read all letters correctly, they got four points (one letter per one point). Then, they read the next words one by one. The time that they spent in reading (speed) was recorded after they finished the reading test. The total of the reading scores (accuracy) in the reading test were sixty-six. The writing test also contained fifteen words (sixty-four letters). When all words were mixed, there were letters a-z in them. The students were asked to write words one to fifteen consecutively by using a slate and stylus. The researcher spelled out the words and the students were asked to write all words consecutively. Points were given if they wrote letters correctly (one letter per one point). The total writing scores (accuracy) in the writing test were sixty-four.

2.2.3 Classroom environment observation guideline.

A classroom environment observation guideline was used to observe the students' behavior while they were studying by using the activity-based learning method in these topics; i.e., participation, relationship and comprehension.

2.3 Data Collection

The process of data collection for this study was as follows:

- Proposed the IRB Submission form to the IRB Committee. Since this study was a classroom research, it was granted an exemption by the IRB.
- After received the Certificate of Excemption, the researcher used the pre-test to test the literacy skills of the sample group before teaching by using the activity-based learning method in the Braille Study period.
- The researcher taught English braille to the sample by using the activity-based learning method through the lesson plans for eight weeks. In the first

four weeks, students were taught using the reading lesson plans and followed by writing lessons in another four weeks.

- In each period, the researcher observed the classroom environment according to the classroom observation guideline while using the activity-based learning method.
- After finishing all the eight-week lessons, the researcher used the post-test to test the literacy of the sample.

2.4 Data Analysis

After the data were collected, it was organized and analyzed. For analysis of the tests, a computer program called Statistical Package for Social Sciences (SPSS) was used to analyze the pre-test and the post-test scores. Data were analyzed by using descriptive statistics. These were mean and percentage. Then, scores on reading accuracy, writing accuracy, and reading speed of the pre-test and the post-test were compared by using a pair sample t-test. For the classroom environment, the researcher analyzed and interpreted the noted data from the observation and categorized into the topics; i.e., participation, relationship and comprehension.

3. RESULTS

3.1 English braille literacy

3.1.1 Reading accuracy

The results of the reading accuracy after studying by using the activity-based learning method of all fifteen students showed that the mean of the post-test score ($\bar{x}$ = 61.00, SD = 8.78) was higher than the pre-test score ($\bar{x}$ = 56.26, SD = 16.11). The students improved their reading accuracy after using the activity-based learning method. However, they were not statistically significant at .05 level.

Table 1 *Paired samples statistics of the pre-test and the post-test scores for the reading accuracy of all students*

	Mean ($\bar{x}$)	**Number of students**	**Standard Deviation**	**Sig. (2-tailed)**
The pre-test reading	56.26	15	16.11	0.72
The post-test reading	61.00	15	8.78	

3.1.2 Reading speed

For the reading speed, a comparison of the means of reading time spent before and after using the activity-based learning method of all fifteen students showed the post-test time spent ($\bar{x}$ = 3.73, SD = 3.32) was less than the pre-test time spent ($\bar{x}$ = 4.87, SD = 4.56). However, they were not statistically significant at .05 level.

Table 2 *Paired sample statistics of time spent (the reading speed) in the pre-test and the post-test in the reading of all students*

	Mean ($\bar{x}$)	Number of students	Standard Deviation	Sig. (2-tailed)
The pre-test time spent	4.87	15	4.56	0.239
The post-test time spent	3.73	15	3.32	

3.1.3 Writing accuracy

For the writing accuracy, the results of the writing accuracy after studying by using the activity-based learning method of all fifteen students showed that the mean of the post-test score ($\bar{x}$ = 58.07, SD = 10.22) was higher than the pre-test score ($\bar{x}$ = 53.73, SD = 14.81). Moreover, the result showed the statistically significant at <0.05 level.

Table 3 *Paired samples statistics of the pre-test and the post-test scores for the writing accuracy of all students*

	Mean ($\bar{x}$)	Number of students	Standard Deviation (sd.)	Sig. (2-tailed)
The pre-test writing	53.73	15	14.81	*0.019
The post-test writing	58.07	15	10.22	

*Note. * Significant level at <0.05.*

3.2 Classroom environment

While the researcher was teaching by using the activity-based learning method in each topic, the researcher also used the classroom environment observation guideline to observe the students in the following areas; participation, relationship and comprehension.

3.2.1 Participation

This topic was separated into participation in activities and interest in the activities.

For the participation of the students in the activities, all students participated in the activities. They paid attention and did the activities. They did all activities from the beginning to the end. No one refused to do the activities. They smiled and said that they wanted to do the activities rather than studying by writing and reading in the traditional way. When they knew that they would ask to play a game today, they shouted "Yeah!" loudly and clapped their hands.

For the Interest of the students in the activities, in the letter finding game, a few students in class 1/2, and 1/3 were bored. They said that they knew and could read letters but they had to wait for their friends who read slower than them. All of the students in class 1/1 could read the letters already and they did the activity without any excitement and usually said "this game is very easy". In the end, all students had the same points and all of them were winners. In class 1/2, there was one student who read braille quite slowly and was always confused between letters u and y, He always said that he was a loser he showed boredom on his face and did not enjoy the activity. While the others could read fast and got the same points. They said that the game was very easy.

They could do it. So, the environment was not exciting. In class 1/3. There was only one student who could read fast but the others spent a lot of time reading in one letter. Two students had a problem in reading. One of them could not read and another one could read very slowly and had a short time concentration. She always said she could not read and she looked very stress when she read. Therefore, this classroom environment was very serious and without any fun. Most of them spent too much time per card. They touched letters, tried to read, and did not say anything while the next students were bored waiting for their turns. The activity usually stuck with one student and could not continue the game. If the researcher did not wait for them, a card would be passed to the only one student who could read quickly and others would not get any points. Therefore, the researcher had to adapt the rule of the activity to help them practice their reading skill. The researcher gave them a card and told them to raise their hands when they were ready to read. If they could read it correctly, they would get one point and could pick another card to read again. At the end of the class who got the highest points was the winner.

For the bingo game, all students enjoyed it very much. The environment was very fun and cheerful. They were very happy when they had the letter and usually asked their friends whether they had the same letter or not. At the end of the class, all of the students asked to play again in the next period. Although students in class 1/3 spent a long time reading, they tried and the researcher helped them to check the letter before they erased dot six.

For the letter matching game, all students were interested in this activity. They did and had fun when they found a card in a box. They smiled and laughed. In class 1/3, it was quite difficult for most students because a card was in a box and they rotated cards incorrectly and spent a longer time to find the correct way and read. However, they were happy and said “Yeah” when they found the letters in the box. They always asked their friends that how many letters their friends could match, and tried to find letters even they used a long time. They would keep on to match to be the winner.

For the letters counting game, the students in class 1/1 and 1/2 had fun with this activity. They competed with their friends and smiled together. However, this activity was quite difficult for a few students in class 1/3 because there were so many letters in a paper and they read them very slowly. Therefore, they lost their concentration and were bored. A few students said that they did not want to count and read again. There were only three students who tried to count and enjoyed this activity.

In sum, results showed that for those students who were fluent in reading English braille letters, the activity of reading letter by letter like the letters reading game made them bored. On the contrary, those students who still could not recognize letters very well found the activity that they had to read a lot of letters on one piece of paper quite stressful for them.

For the writing activity, the students loved Braille drawing very much. They had a concentration when they drew. They tried and asked to draw again if they had a mistake. After class, they showed their pictures and tried to write again by themselves. A few students in three classes created their own pictures when finished the activity. They created new pictures by mixing the heart flag and the truck in one picture and colored them for fun. For writing word competition

in each picture, they liked this activity too. They enjoyed writing and always asked their friend that how many rows they wrote. When they wrote incorrectly, they said they had to do better in the next time.

3.2.2 Relationship

This topic was separated into relationships between the students and the teacher, and between students and students. For the relationship between the students and the teacher, all students had a good relationship with the teacher. That was noticed from the action of students. They were friendly with the teacher. They asked the teacher when they had questions, asked for help when they had problems, and expressed their feeling while they did the activities. For example, they expressed that they wanted to do it again when they liked the activity. They also told the teacher that they could not read and they did not want to do it anymore. When the teacher came into a class, the students always asked about what game they would play in this period and asked for their favorite game such as the bingo game and the braille drawing.

For the relationship between students and students, they were friendly with one another. They smiled and talked about the activities while they did it. They always asked their friends' scores when they did the activities. In addition, they helped their friends when they were confused. For instance, when a few students forgot some letters, they asked braille dots to check and their friends would indicate the correct dots.

3.2.3 Comprehension

Comprehension in activities and lessons, students understood the activities and the lessons. They could do the activities after the teacher explained how to do them. However, in the bingo game, they spent a lot of time to understand. They were confused about how to erase dot 6 and how to get bingo. They did not know that they bingo or not. Therefore, they spent time too much to understand and had less time to play.

4. DISCUSSION

In this section, the results will be discussed. English Braille literacy in this study refers to reading accuracy, reading speed, and writing accuracy. Although only the result of writing accuracy was significantly improved at .05 level, all means of the post-test scores were higher than the pre-test scores. As Hudson (2012) said Braille activity was a good way to teach braille to young braille learners, other researchers also considered similarly with learners without disability. Studies were also conducted using activities and games in different subjects. Festus (2013) studied the activity-based learning method in the mathematic class while Roekmuang (2009) used vocabulary games to teach English vocabularies to primary students. Results were similar with the findings in this study that the students enjoyed the lesson more than studying in the traditional way and that the students could develop their skillss better. Allowing students to actively participate in the activities rather than having them sit passively listen to what teachers told them would lead to students being able to retain what they learned more sustainably (Festus, 2013; Okawuishu, 2011). These results supported the expression of Lillard (2013) that play is the work of the child. The classroom environment was also important because a good environment; i.e., physical elements

(e.g. resources, wall art, and arrangement of desk) and intangible elements (e.g. energy of the classroom, the rules and happiness) in the classroom could impact students' achievement (Hannah, 2013). It was a positive reinforcement that supported the learning behavior of students and could increase their learning retention. (Chularut, 2005). Furthermore, it also supported students to have a good relationship between one another and it could increase an inspiration to study in the classroom (Limbu, 2012). Therefore, choosing appropriate activities for students was so important. The observations showed that some activities were appropriate for students in some groups and some activities were appropriate for students in every group. Letter reading game was not appropriate for students who could read Braille well because they could read well already. This letter reading game depended on reading accuracy only. It did not have a time limit to judge the winner, so it did not challenge them. On the other hand, a few students who could not read well were frustrated in letter counting game because they spent a very long time decoding. When they had to read a lot and count at the same time, they were discouraged and did not have fun with this activity. For other activities, especially the bingo game and braille drawings could be enjoyed by all students. They were a good choice to be used to develop students' literacy.

Braille drawing was a new activity for students with visual impairment in this study. Most of them could not draw like sighted people but they also wanted to draw. According to Rex, Koenig, Wormsley & Baker (1994), the purposefulness of writing was important because it could encourage students to write. Gadd, Berthen & Lundgren (2021) also stated that the setting of writing purpose could make students became better writers. In this activity, the purpose was a picture. The students tried to write correctly and even practiced outside the class in order to get a perfect picture.

The result of the classroom environment observations showed that most of the students requested to draw a new picture in every period. It supported the fact that having a good attitude with things they learned could increase the efficiency of good memory. (Reilly & Ward 1997) In addition, students who had a positive attitude in the lesson was more diligent and this led to students' achievement (Maharaj-Sharma & Sharma, 2017). The students always showed the pictures that they drew in their free time to the teacher. This indicated that students had fun with the activities and practiced more. Students who practiced more could develop more (Pattillo, Heller & Smith, 2004). These could be the reason for the writing accuracy scores that was improved most.

For Bingo game, it was a fun game that students could enjoy together. This game did not depend on reading skills only but also depend on their luck. Therefore students who could read well were not always the winner. Everyone could be the winner. Thus, all students had the encouragement to participate in the activity. Puspita and Losari (2016) studied the influence of the bingo game on students' vocabularies. The result showed that there is a significant influence of using the bingo game on students' mastery of the vocabularies. Furthermore, the bingo game did not require many materials, so the students could make bingo cards by themselves and play with their friends outside the classroom.

The findings showed the implication that the activity-based learning method was a good way to develop braille literacy. Consequently, teachers should try to use other new activities to develop students' literacy rather than just let students to memorize braille dots only.

Since this study focused on the use of activity-based learning method with basic uncontracted braille (one braille sign equal one English print letter), the future research may consider to expand the study to contracted braille (one braille sign equals one print word). The contracted braille may be useful to the students because it can help students to read and write faster and many books in higher grades are in contracted braille.

5. CONCLUSIONS

In conclusion, students with visual impairment have better English braille literacy after studying by using the activity-based learning method. The writing accuracy was improved the most. Furthermore, the bingo game and the braille drawing were the activities that students enjoyed more than the other activities and every student who could read and write braille could do these activities together. In addition, these activities were easy to prepare and they could play by themselves. The students could play when they have free time and they could practice braille writing and reading outside the classroom. In this way, students had more fun practicing braille reading and writing skills than they used to in the traditional rote learning.

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History of Research and Development of the Finger Joint Rehabilitation Device in Japan in the Past Decade

Shigeo HIRANO[1, 2], Susumu KISE[2], Sozo SEKIGUCHI[2],
Kazuya OKUSAKA[2] and Tsutomu ARAKI[3]

[1]Professor emeritus, Tokyo City University
1-28-1 Tamazutsumi, Setagaya Ward, Tokyo, 158-8557, Japan

[2]Artner Co. Ltd
Sumitomo Nakanoshima Building 2F,
3-2-18 Nakanoshima, Kita Ward, Osaka City, 530-0005, Japan

[3]Professor emeritus, Tsukuba University of Technology
4-3-15 Amakubo, Tsukuba City, 305-0005, Japan
[1]*rs4775hirano@ybb.ne.jp*, [2]*kise@artner.co.jp*, [3]*tutaraki@yahoo.co.jp*

ABSTRACT

With the aging society, the demand for rehabilitation medicine is diversifying, and the expectation and demand for engineering support are extremely high compared to other medical fields. For example, the role of rehabilitation equipment is broadly divided into the complementary role of health care workers involved in rehabilitation medical care and the support of family nursing ability. In the study, the rehabilitation equipment was designed and developed from an engineering point of view as one of the methods to recover the grip function at the finger joint due to sequelae such as cerebrovascular disease. In particular, grasping an object by a finger is an extremely complicated dynamic phenomenon that controls the direction and magnitude of the force generated at the fingertip by muscles and balances the force acting on the object. Development research on rehabilitation equipment is a rare technology development in the world. In this paper, we describe the transition of the research results that we have been conducting since 2006 in response to requests from medical institutions. We also propose a new hand-operated rehabilitation device for finger joints based on a number of development devices, focusing on the flexion and extension of four fingers.

Keywords: Rehabilitation equipment, Finger joint, Miniaturization, Weight saving, Simple mechanism, Flexion and Extension

1. INTRODUCTION

The first and second most common causes of death in Japan are malignant neoplasm and cardiac disorder, followed by cerebrovascular disease. However, the percentage of people who die of cerebrovascular disease has been decreasing annually[1)]. Two reasons behind this trend are as follows; one is the early detection of diseases as a result of the advancement and elaboration of medical devices owing to marked progress in medical technologies and the fusion of medical and engineering fields. The other is the improvement of treatments for patients in an acute stage.

However, the number of patients who remain alive but become orthopedically impaired is tending to increase. According to the survey results reported by the Ministry of Health, Labour and Welfare in 2008, the number of physically handicapped people in Japan is estimated to be 3,500,000. Among these, the number of orthopedically impaired people is 1,760,000, which is greater than any of the numbers of people with other disorders (vision disorder, auditory/language disorder, and internal impediment). Among orthopedically impaired people, the number of people with upper limb dysfunction is 450,000, which is the second highest after the number of people with lower limb dysfunction[2].

The rehabilitation for patients to alleviate their dysfunction is divided into two types: rehabilitation for patients in the acute phase and for those in the chronic phase. The purpose of rehabilitation for patients in the acute phase is the alleviation of and recovery from aftereffects. In contrast, the purpose of rehabilitation for patients in the chronic phase is the resumption of normal activities.

Rehabilitation is carried out at medical institutions mainly by therapists (physiotherapists, occupational therapists, and speech therapists), doctors, and nurses. After recovery, the rehabilitation carried out at institutions is replaced by independent rehabilitation carried out at home with the help of visiting therapists. However, the number of therapists and nurses involved in rehabilitation is insufficient, and no marked increase can be expected in the future. In addition, the institutions that provide rehabilitation are concentrated in large cities, and the numbers of rehabilitation institutions, therapists, and nurses in local areas are limited, causing the insufficient rehabilitation of patients[3].

Under such circumstances, the development of rehabilitation devices with which patients can independently carry out rehabilitation has been demanded. The development of small and lightweight rehabilitation devices for finger joints is important from the viewpoint of enabling patients to carry out rehabilitation anywhere[4].

It has been medically demonstrated that moving the fingers, especially the tip of the fingers, stimulates brain nerve cells, promotes brain activity, and prevents cerebrovascular disease, and thus is an effective means of rehabilitation[5),6),7)].

The number of rehabilitation devices dedicated for specific movements of fingertips is small. There are several manufacturers in Japan and overseas that have been involved in the development of rehabilitation devices for finger joints; however, the number of devices that are particularly effective for complicated and composite movement of finger joints is limited. Conventional devices are superior in terms of functionality but are large and heavy (8 kg) because they are applied to the rehabilitation of fingers, finger joints, and forearms. The operation of these devices is complicated, and the assistance of physiotherapists and helpers is necessary to attach and operate these devices during rehabilitation. In addition, these conventional devices are expensive[6),8)].

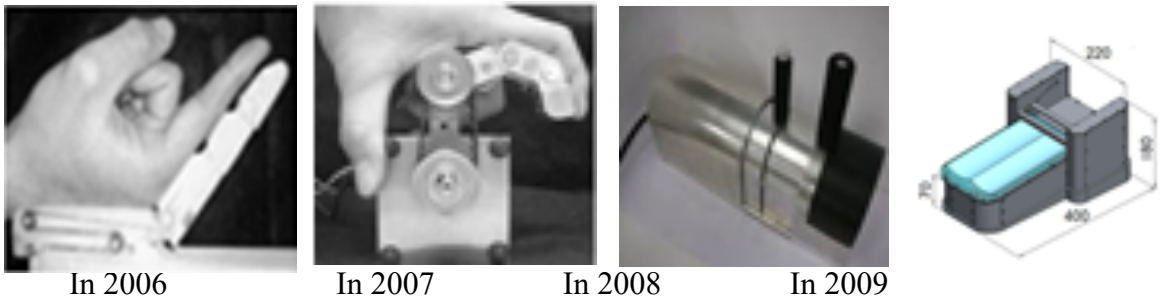
In this paper, we explain the following. (1) Since 2006, as requested by medical institutions, we have been developing small and lightweight rehabilitation devices for finger joints that can be used at actual medical sites. The history of the research and development is explained. (2) Electric power has been required for the operation of rehabilitation devices dedicated for finger

joints. However, the device that we developed in 2010 is operated manually. The characteristics of this device are also explained.

The purpose of this study is to develop a practical rehabilitation device with a simple mechanism that enables continuous rehabilitation, to examine their effectiveness, and then to demonstrate the feasibility of the developed device as a practical rehabilitation tool through a third-party evaluation of its performance and conditions.

2. HISTORY OF THIS RESEARCH

Figure.1 shows the history of the research of rehabilitation devices for finger joints[9]. The research was initiated in 2006 as requested by medical institutions. In the basic research in 2006, passive movement of fingers was clarified using a prototype device. In 2007, a device that enables rehabilitation of one finger was designed on the basis of the results of basic research and its effectiveness, and the points needing improvement were examined. In 2008, a rehabilitation device that can be used in actual medical sites was designed and developed taking into consideration the above points. Health professionals (doctors and therapists) tested the developed prototype device in actual medical sites. In 2009, for the further improvement of effectiveness and the reduction of weight, analyses of the design and operation were carried out. Through these activities, we designed and developed a new rehabilitation device for bending and stretching four fingers in 2010[10].



In 2006 In 2007 In 2008 In 2009

Figure 1. *History of the research.*

3. DEVELOPMENT AND DESIGN ON NEW DEVICE (2010)

3.1 Target users and basic operation

The target users were patients with cerebrovascular disease (or resulting nervous disorder). The target operation was continuous practice to widen the range of joint mobility to prevent the joint contracture that occurs during the recovery phase of patients with cerebrovascular disease. The dimensions of the device were decided on the basis of average finger measurements of elderly Japanese males and females[11),12),13)].

3.2 Design concept

First, the design concept of the device was examined and defined. The aim of the rehabilitation device is the improvement of the quality of life (QOL) of users in daily activities.

Therefore, the satisfaction of users is the first priority. Turning ideas into an actual device is not sufficient. It is also necessary to make the device attractive to users so that they can feel a satisfactory sense of ease and be undaunted by the design of the device.

Not many health professionals have both medical and engineering knowledge in terms of the operation and structure of devices. Both engineering and medical viewpoints are important in realizing the widespread use of a rehabilitation device. Not only developers but also users and those who manage the devices are required to become knowledgeable about the mechanism and the method of use.

The Brunnstrom recovery stage test is a typical method of objectively evaluating the effectiveness of rehabilitation. Our device focuses on four fingers. Therefore, we focused on the item "turning a doorknob" in the Brunnstrom test as an index and a quantitative standard of judgment of functional recovery. Note that the force required to turn a standard home doorknob (diameter of the grip, 50 mm) is 3.5 N·m.

We specify the following design concepts.

(1) The mechanism of the device and the method of use should be simple so as to be understood by anyone involved in the use of the device.
(2) The device should have an appearance that lessens its image as a machine and provides a sense of ease to users as well as a benign design.
(3) Continuous exercises to expand the range of finger joints, focusing on bending and stretching operations, should be possible.
(4) The device should be portable (small and lightweight).
(5) The device should be manually operable.

3.3 Design specifications

The basic specifications of the device are as follows.

1) Main body mass M1

The developed device is lighter than conventional devices. The mass of the device developed in 2008 was 7.4 kg, which was reduced to 5.5 kg (25% reduction) in the device developed in 2009 to improve the portability. However, a further reduction in the mass was considered to be necessary, and the mass of the main body of the device developed in 2010 was set to 4 kg, which is a further reduction by 25% compared with the device developed in 2009.

2) Portable mass M2

The portable mass of the main body of the device is assumed to be equivalent to(?) the mass of an arm assuming that a user fixes his/her arm to the device from the fingers to the elbow. On the basis of the average mass percentage of one arm relative to the entire body, the mass of an arm was calculated to be 2.5 kg, and this was set as the portable mass.

3) Required thrust force F1

The grip force of fingers is quantified to determine the required thrust force for the device. The required thrust force F1 is the maximum load applied to the finger driving section, which is

assumed to be the force applied to a patient by a therapist during rehabilitation. The maximum force of a fingertip when a healthy subject pushes an object is used as the required thrust force F1. The maximum force is applied by the left thumb of a healthy subject (108 N). Therefore, the required thrust force F1 was set at 110 N.

4) Required thrust force F2

The required thrust force F2 is the force required by the user to move the device forward or backward to bend and stretch the finger driving section. The device is operated manually; thus, the force of the user's arm should provide the required thrust force F1. To this end, the required thrust force F2 should be set as small as possible. The force of an arm with an elbow angle of ≤90° of a person in a seated position is typically 160 N at minimum. Therefore, the required thrust force F2 was set at 160N.

3.4 Basic operation

The target fingers are the four fingers except the thumb. The thumb moves in a direction different from that of the other four fingers and thus is excluded from the target. The most important characteristic of the device (Figure.2) is that it is operated manually. The basic principle and the method of rehabilitation are outlined below.

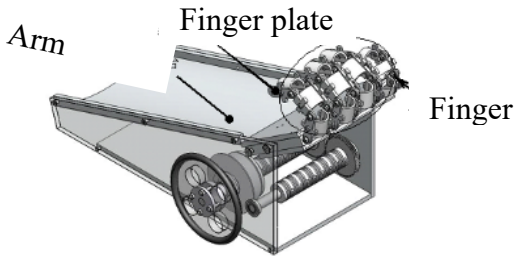
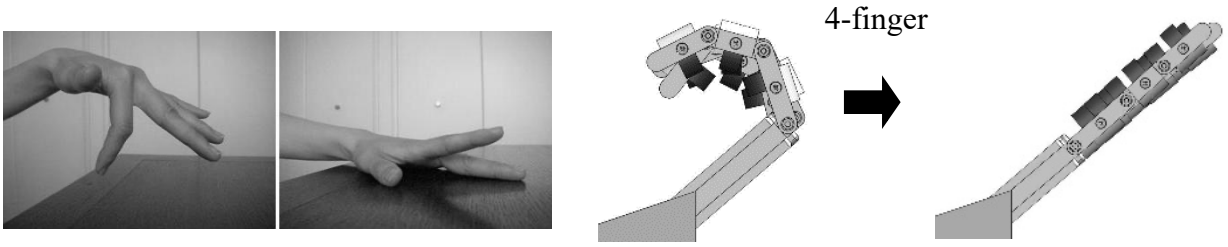


Figure 2. *Characteristic of the device*

(1) Place the right upper arm on the arm support with the palm turned upward.
(2) Fix the four fingers to the finger driving section.
(3) Secure the upper arm to the arm support.
(4) Move the main body of the device forward so that the finger driving section is bent being pulled by wires.
(5) Move the main body of the device backward to stretch the fingers.

Figure 3 shows the schematic of the bending and stretching operations of fingers using the device. The voluntary forward and backward movements of the device are applicable to symptoms of joint contracture and flaccidness of the finger joints. In addition, it is possible to set the range of joint movement as desired, leading to less pain, sense of discomfort, and anxiety.

Moreover, users can use the manually operated device anytime, anywhere because no electricity is required. The finger driving section simulates the structure of human fingers.



(a) *bending* (b) *stretching*

Figure 3. *Bending and stretching operations of fingers*

4. EXAMINATION BY RAPID PROTOTYPING (RP) AND FABRICATION OF PROTOTYPE DVICE

4.1 Examination by RP

Before fabricating a prototype device, we carried out RP of the main parts in cooperation with Professor Tsutomu Araki (Tsukuba University of Technology) to examine the assembly and shape of the prototype. Figure 4 shows a photograph of the prototype device obtained by RP. The items examined in the operation test of the prototype device and the results are explained.

4.1.1 Checking of operation

1) Move the device forward so that the finger driving section bends.
2) After bending is confirmed, move the device backward to stretch the finger driving section.
3) Repeat steps 1) and 2) to confirm the operation of the finger driving section.

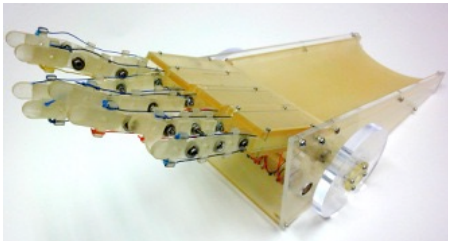


Figure 4. *Prototype device obtained by RP*

4.1.2 Results

1) The bending angles of fingers varied. To address this problem, the device was improved so that the wires would be reeled smoothly.
2) Wires loosened excessively, which led to an increase in the number of rotations of the winding drums during the bending and stretching operations. The length of idle wires was reduced so that the tension of the wires was directly applied to the winding drums.

3) Wires were not smoothly wound. The mechanism of the winding drums was improved. Figure 5 shows the bending and stretching operations of the RP prototype device.

(a) *bending* (b) *stretching*

Figure 5. *Bending and stretching operations of the RP prototype device.*

4.2 Fabrication of prototype device and confirmation of its functionality

Figure 6 shows the prototype device developed.

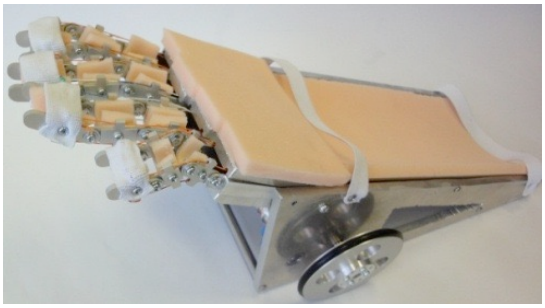


Figure 6. *Prototype device developed*

1) Safety

The conventional rehabilitation devices are driven by a motor, and safety problems related to overloading and unwanted operation may occur. With the newly developed device, the force of the arm of the user or a helper, instead of electric power, is utilized. This mechanism reduces the risk of unwanted operation; users can stop the operation of the device at their own discretion when they feel an overload. In addition, as a safety measure, a torque limiter was placed at the main shaft. The main shaft is directly connected to the wheels, which link the main shaft to the winding drum. A cutoff torque is set on the torque limiter; the torque limiter blocks the transmission of torque between the main shaft and the winding drum when a torque exceeding the cutoff torque is detected, that is, the user feels strong pain.

2) Operation test

Operations of the prototype device were tested following the procedures used for the RP prototype device.

(1) Bending commenced after the device was moved forward by 280 mm; complete bending was confirmed. Bending of the third finger was the smoothest.

(2) When the device was moved backward by 70 mm, stretching from the fingertip commenced. The stretching was not smooth; the degree of stretching varied among fingers.

(3) After repeated bending and stretching, the device did not return to the original stretched state even when the device was returned to the initial position. It is considered that even though contact between neighboring wires was prevented after the improvement, the above problem occurred because the direction of wire winding changed before a sufficient difference in tension between upper and lower wires was achieved.

5. EVALUATION OF EFFECTIVESS AND QUESTIONNAIRE SURVEY

5.1 Measurement of various parameters during operation

The difference in the position of the rotation center between the device finger and the actual finger secured on the device was measured, as were the angles of bending and extending, using a medical protractor and a ruler to judge the difference in bending and stretching operations between the device and actual fingers. The measurement conditions were as follows.

5.1.1 Measurement conditions

1） Secure fingers to the device and move the device forward for the bending operation.

2） Continue the bending operation; measure the bending angle of the device finger when the torque limiter is in effect.

3) Move the device backward for the stretching operation. Measure the stretching angle of the device finger.

4) The angle is assumed to be 0^{o} when fingers are stretched, and the angle of bending is assumed to be positive. The maximum bending angle of the device is $\pm 90^{o}$. The items measured and the results are not shown here.

5.2 Discussion of measurement results

The error in the position of the rotation center between the device finger and the actual finger secured on the device was more than 10 mm because the fingers were not perfectly fitted to the device. The error in the position of the metacarpophalangeal (MP) joint was large because the positions of the rotation center were not in agreement between the device and the finger. The error in the position of the fifth finger was also large because the fifth finger did not fit the device well. The error in the position of the MP joint was the largest, followed by those of the proximal interphalangeal (PIP) joint and distal interphalangeal (DIP) joint. Although the rotation centers of the device fingers did not agree with those of actual fingers, fingers were bent and stretched from the joints close to the fingertips. The difference in the position of the DIP joint in the bending state tended to be large, indicating that the load applied to the DIP joint by the device was the largest. The displacement among fingers in the stretched state was not uniform. Further improvement of the stretching operation of the device is required.

5.3 Questionnaire survey and results

A questionnaire survey was carried out with 12 healthy subjects for third-party evaluation of the effectiveness of the device. Table 1 shows a summary of the results.

The subjects were instructed to answer the questionnaire on a five-point scale (5, good; 1, poor). Regarding the size of device (questionnaire items 2, 4, 5, and 6), 5 means too large, 3 means moderate, and 1 means too small. Regarding the mass of the device (questionnaire item 3), 5 means too heavy, 3 means moderate, and 1 means too small. Regarding questionnaire items 8 and 9, 5 means too strong, 3 means moderate, and 1 means too weak.

Table 1. *Results of questionnaire survey.*

No.	Questionnaire items	Evaluation
1.	Is the device attractive?	3.4
2.	Is the size of the device appropriate?	3.8
3.	Is the mass of the device appropriate?	3.9
4.	Is the size of the arm support appropriate?	3.8
5.	Is the size of the hand-securing cradle appropriate?	3.9
6.	Is the size of the finger-securing rods appropriate?	2.3
7.	Is the device easy to move?	2.8
8.	Is the force during bending appropriate?	2.9
9.	Is the force during stretching appropriate?	2.6
10.	Do you feel uneasy during the operation of the device?	4.0
11.	Is the mechanism of the device easy to understand?	4.3
12.	Do you think effective rehabilitation is achieved using the device?	3.4
13.	Do you think you can use the device for a long period of time?	2.9
14.	Is the device easy to operate?	4.4
15.	Do you think the device is applicable to patients requiring rehabilitation?	2.1

As shown by the questionnaire results, many respondents considered the device to be too heavy and the size too large. The stretching strength of the winding drum above the torque limiter was considered appropriate, and the device satisfactorily assisted bending and stretching operations without applying additional load. Respondents evaluated the mechanism and driving method of the device as being easy to understand, satisfying the basic concept of a simple rehabilitation device. However, the appearance and sense of ease(?) were unsatisfactory. In the future, we plan to improve the device by reducing the sense of anxiety caused by its appearance so that it will be better received by users.

6. CONCLUSION

With the arrival of an aging society, the importance of medical rehabilitation devices has been increasing. Among them, the number of studies on the practical use of rehabilitation devices for lower limbs has been increasing; however, the number of studies focusing on rehabilitation devices for upper limbs, particularly the fingers, has been limited.

Under such circumstances, we have designed and fabricated, by RP, a prototype device that can continuously and manually support bending and stretching operations of the fingers

without the need for electrically driven motors, on the basis of the basic concept of a small, lightweight, and easy-to-operate rehabilitation device.

The device was made primarily for the elderly, and the dimensions of the fingers were precisely simulated using the data in the Handbook for Standard Figures and Equations Based on Human Engineering. The operation and mechanism were confirmed by RP in advance of fabricating a prototype device. Thus, points to be improved were identified before fabricating a prototype device, leading to smooth fabrication. The following are the main points in this study.

1) A rehabilitation device that can simulate the movement of human finger joints and that fit the actual dimensions of human fingers was designed and developed. A prototype device based on the design concept, which was revealed from the results of a questionnaire survey, was developed.

2) The operation and fit of the prototype device were examined. It was found that the prototype device supports bending and stretching operations of fingers, demonstrating its effectiveness as a rehabilitation device.

3) From the questionnaire survey, reasonable evaluations of the appearance, size, mass, the sizes of the arm support and hand-securing cradle, the mechanism, and the operation method, were obtained. However, the attractiveness of appearance and the alleviation of unease, for example, should be further improved, considering the practical use by patients.

4) We developed, for the first time, a manually operated rehabilitation device dedicated for finger joints. A prototype device was fabricated, and its validity as a rehabilitation device was demonstrated by measuring its effectiveness.

In this study, we endeavored to integrate engineering and medical knowhow. It is necessary to develop a rehabilitation device with an easy mechanism that enables continuous rehabilitation so that the gap between engineering and medical aspects is narrowed. In subsequent studies, we are planning to carry out an overall evaluation of the rehabilitation device toward its practical use after conducting effectiveness evaluations with medical professionals and the elderly.

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An Ethnographic Study on Socio-Emotional Learning Program under the COVID-19 Pandemic: Teachers' Perspective

J. J. N. Tabasa, N. B. Delgado, D. G. S. Ariz
(Preschool Supervisor), (School Directress, R.S.W.), (Gradeschool Supervisor)
MindHaven School Inc., Roxas City, Capiz, Philippines

janjadet@yahoo.com, nenetdel@yahoo.com, arizyhan@gmail.com

F. S. Emboltura
R.N., M. Ed.-SPED
College of Liberal Arts, Sciences, and Education, University of San Agustin, Iloilo City, Iloilo, Philippines
femboltura@usa.edu.ph

ABSTRACT

For an Inclusive Progressive School working to help young people with and without needs in this COVID-19 pandemic time, addressing the need for it's the teachers to stay connected to one another is not a self-indulgent activity. On top of technological, academic, and student behavioral problems due to transition from face-to-face delivery to Distance Learning delivery, there is a real necessity to figure out how to help teachers help themselves and how to help the team resolve and transform conflict and empathize and feel strongly synergized to one another in attaining the larger mission of the school. Maximizing by modifying the existing valuable tools of the school's Socio-Emotional Learning Program (that was already in full swing even before the pandemic) offers an answer to these needs. The study showed how the modification of an existing Socio-Emotional Learning Program, which primarily focused on the students and parents, shifted its target audience to produce an intentional, holistic, and responsive Socio-Emotional Learning Program for teachers during COVID-19. This study aims to find out a.) How a Socio-Emotional Learning Program was modified to become a safe venue for teachers to have an intimate facilitated space for themselves to sustain their Socio-Emotional Learning, thus mitigating the mixed mental health challenges of extreme stress, exhaustion, and disengagement during COVID-19, and b.) How the teachers responded personally and professionally to the modifications done to the Socio-Emotional Learning Program.

BACKGROUND

"The five most-mentioned feelings among all teacher were: anxious, fearful, worried, overwhelmed and sad. Anxiety, by far, was the most frequently mentioned emotion"

(Result of the survey by the team at the Collaborative for Social Emotional and Academic Learning, known as CASEL, to unpack the emotional lives of teachers during the COVID-19 crisis.

-Yale Center for Emotional Intelligence, 2020

The reasons educators gave for these stress-related feelings could be divided into two buckets. The first is mostly personal, including a general fear that they or someone in their family would contract COVID-19, the new coronavirus. The second pertains to their stress around managing their own and their families' needs while simultaneously working full-time from home and adapting to new technologies for teaching[1].

Before the COVID-19 crisis, study showed that 85 percent of teachers reported that work-life imbalance was affecting their ability to teach. These studies found that the general causes of teacher stress and burnout are related to a lack of strong leadership and a negative climate, as well as increased job demands, especially around testing, addressing challenging student behaviors, a lack of autonomy and decision-making power, and limited-to-no training in social and emotional learning (SEL) to support educators' and students' emotional needs.[2]

Now, during COVID-19 without enough time to adjust to the new normal of online learning; instead there are high expectations & even unrealistic expectations of teachers" becoming distance learning experts overnight to support uninterrupted learning for all their students while also caring for the ever-evolving demands of their families, "it's no surprise that 95 percent of the feelings they reported recently are rooted in anxiety[3]. Many educators, however, are keenly and understandably focused on "getting the academics right" with online learning. With their classrooms, student relationships, and support systems upended by the school closures, social-emotional learning may not be a priority. The worst things we can do for our teachers, students, and families is de-prioritize SEL during the pandemic," 'It is next-to-impossible to expect teaching and learning to occur in a crisis without attending to our emotions. School buildings can be stressful places, but they are also places where educators have built strong relationships. In the article written by Walker in 2020 as he interviewed Turner who is a passionate teacher, leader & innovator of SEL in, that being in school each day can be a big comfort, and educators don't have that right now. Furthermore, he said that staff connection, empathy, and support is just as important as what we need to do for our students in this crisis.

The Covid-19 challenges to teachers

1. Disruption of established instructional programs and routines.

In the wake of COVID-19, educators are facing unprecedented challenges, including the disruption of established instructional programs and routines, the rapid transition from in-person teaching to remote learning, the emotional toll of isolation due to social distancing efforts, and uncertainty about personal safety and health.[4]

Pandemic is a crisis most people, including educators, never have imagined & it has been the source of them experiencing mixed emotions of intense grief, greater anxiety, fears, stress and burnout than ever before.

2. Mental Health & Well Being

Under Pandemic, the prevalent feeling of Grief is not only because many lost their family members to this virus but because "Grief is the process of missing something lost in life." The journey the mind makes after a loss is called the grieving process".[5] Covid -19 caused Grief from great losses from financial to social conditions to what was normal life before its occurrence.

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Sadly, for most people, again teachers included, the grieving process was covered by school closures, and thus the need to transition from face to face to Distance learning was operated on under panic & crisis mode.

3. Balancing personal & professional life.

Moreover, teachers struggle when they can't envision a way to meet their daily responsibilities as caregivers & as teachers of their own children at home, of their students in online classes, responding to parents demands and being bombarded (- from the hierarchy of the Education Department)-by these lofty and wide-ranging expectations of juggling attendance to online teachers' training, to reporting .When faced with too many simultaneous and competing demands but feel like they don't have anyone to turn to for help, they become insecure & fearful & demoralized. These feelings are aggravated especially when they lack the tools- internet connection, laptops & other supplies that they need to serve their students

In a survey from August to September by the National Board for Professional Teaching Standards, the vast majority of teachers reported working longer hours, and only a quarter said their school offered adequate support for mental health.[6]

SCHOOLS RESPONSE IN SUPPORT OF THE TEACHERS CHALLENGES

The time has come for *all* schools to address the missing link in what will help educators' thrive—a greater focus on *all* adults' health and well-being. If we want our educators to be successful—both personally and professionally—schools must be places that bring out the best in them.[7]

Educators, scientists, public health experts and policymakers have spent decades—rightly, though with varying degrees of success—on *optimizing the educational environment for children*, by focusing on safe, culturally responsive and engaging classroom environments that meet the needs of diverse learners and develop the whole child. As a behavioral geneticist focused on the mind-body effects of stress and the development of resilience, I believe it is clear that in order to do this well, we must also focus on *optimizing the school environment for teachers*.[8] Providing this environment is a real challenge that has to be accepted with a fruitful responsive program like CASEL.

CASEL's Definition of SEL (2020 Update):

"Social and emotional learning (SEL) is an integral part of education and human development. SEL is the process through which all young people and adults acquire and apply the knowledge, skills and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions.SEL advances educational equity and excellence through authentic school-family-community partnerships to establish learning environments and experiences that feature trusting and collaborative relationships, rigorous and meaningful curriculum and instruction, and ongoing evaluation. SEL can help address various forms of inequity and empower young people and adults to co-create thriving schools and contribute to safe, healthy, and just communities."

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CASEL will continue emphasizing how environments, relationships and broader contexts shape learning and development

SEL is most beneficial when school leaders and educators enhance both the competencies of young people and adults and the systems in which those competencies are promoted.

Given the uncertainties and challenges of today's world, our education systems should prioritize SEL to build healthy relationships, engage students and support adults to contribute to more equitable schools and communities.[9]

While it is difficult to find bright spots in a pandemic, we now have an opportunity to reflect on how to foster teacher wellbeing practices that encourage teachers to build and strengthen caring relationships with one another and with their students and prioritize designing and sustaining classrooms where everyone feels emotionally and physically safe and supported.[10]

Defining Teacher Wellbeing

Teacher wellbeing can be described as the reaction to the individual and collective physical, environmental, and social events that shape how educators respond to their students and colleagues.[11] Leaders can create a positive school environment that can boost teacher wellbeing and improve academic achievement by respecting educators as professionals, granting teachers autonomy and voice, creating opportunities for relationship building, and setting realistic goals.[12]

In The National Level

In the Philippines, Briones, during a televised meeting with President Duterte on August 31, said that DepEd has always been aware of ensuring the mental stability of both students and its personnel – both teaching and non-teaching. However, the COVID-19 pandemic has a great impact on the way people behave during this time. Psychosocial problems, Briones said, "have emerged" among students. "Before, we had guidance counselors but their focus was the learners," Briones said. "Now, even the teachers, regional directors, and even undersecretaries need psychosocial support," she added.[13]

Local Level at MindHaven School : An Inclusive School's Response to support Teachers.

SCHOOL'S HISTORY

Fortunately, for Mindhaven School , the teachers, just like their counterparts all over the world , are not exempted from stress ; anxieties ; conflicts among themselves ; dealing with parents issues & their students challenging behaviors . However, what made them more resilient amidst this pandemic is the school's established Socio-Emotional Learning Program embedding Restorative Justice Practices.

MindHaven School has been practicing Restorative Justice (though under a different name) since 1993 through its Inclusive Program. Restorative Justice has always been a critical component in the school's Socio-Emotional Program for children both with and without needs evidently showcased by our "Bata Mo, Bata Ko" Socio-Emotional Learning Program. "Bata Mo, Bata Ko" is a Filipino saying which translates to "Your child is my child", harkening to the adage that that it takes a community to raise a child. The main objective and goal of this Socio-Emotional Learning Program is to provide a quality sequential and developmentally appropriate curriculum (for toddlers to primary school age) in Socio-Emotional Learning that develops self-awareness,

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[9] *NIEMI K., (2020). Niemi: CASEL Is Updating the Most Widely Recognized Definition of Social-Emotional Learning. Here's Why.*

[10] *Porter T., (2020). Reflecting on Teacher Wellbeing During the COVID-19 Pandemic.*

[11] *Graham A., & Truscott, J. (2019). Meditation in the classroom: supporting both student and teacher wellbeing? International Journal of Primary, Elementary and Early Years Education, 3(13), 1–13.*

[12] *Albrecht, N. J., (2019). Responsibility for nurturing a child's wellbeing: teachers teaching mindfulness with children. Asia-Pacific Journal of Teacher Education, 47(5), 487–507.*

[13] *Malipot M.H., (2020). Briones: Mental resilience of students, teachers a 'big challenge' for DepEd.*

self- management , social awareness, relationship skills under which conflict resolution or restorative justice practices are observed, to arrive at responsible decision-making and which addresses inclusivity (especially of children with disabilities and from poor families) and sustainability with significant collaboration of the school, families, and community
The children are at the heart of the program....

"It is through this program that stakeholders developed needed socio –emotional concepts, knowledge and skills to create and nurture individual, group and communal peace. The sheer magnitude of program implementation required all of us to work together showing that efforts towards peace and reconciliation can only succeed with a collective approach built on connectedness, trust, courage, dialogue, collaboration, hope & faith.

Establishing the program overcame so many challenges but it does not stop there. Sustaining a culture of peace is a continuous journey of conflict transformation as it has to be seen as the essence of a new humanity, a new global mindset with empathy and compassion based on inner respect for uniqueness, embracing oneness with people & nature and acceptance of diversity.[14]

For teachers of MSI, school lockdown disrupted the continuity & consistency of teachers implementation of Collaborative Socio-Emotional Learning now that the program is delivered virtually to parents, students & among teachers themselves. This alone caused great burden with feelings of guilt, insecurities, anxieties that can result to isolation, mis communications & disconnection from the team.

Emotions are contagious, especially during crisis —for better and for worse—and underlie both learning and retention at all ages and stages on the developmental spectrum. Hence the critical need to focus on improving the health of the *entire relational dynamic system* that exists within a school. Moreover, emotions in professional relationships is the foundation of teachers wellbeing to optimize professional performance to continue to develop and instill Socio-Emotional practices among students so as to foster academic re-engagement while bolstering student health and well-being even in remote learning. To buffer stress, and both create and sustain the necessary conditions for emotional and physical healing, education systems and individual schools must prioritize teacher wellness as the first step in student recovery.[15]

They key to the sustainability of Socio_-Emotional Learning in MSI is the Team of Teachers, staff & administration under pandemic whose mental health condition is directly affected by these new conditions.

Bottom line: Teachers cannot help to stabilize their students nor their classroom environments unless they are healthy themselves.[16]

Theoretical framework:

Implementation of these programs started since its foundation almost 30 years ago up to the present under its Innovative Inclusive Program. "As a result of this Socio-Emotional Program, positive relationships & significant growth and development have been observed especially in children with needs & a collaborative & responsive culture has been created in school.[17]

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[14] Delgado N.B. et al., (2019). Restorative Justice as Practiced in School: A Study of an Inclusive School's Approach in Developing the Socio-Emotional Skills of Children with Special Educational Needs.
[15] Walker S.O., (2020). Teachers Are Living in a Tinderbox of Stressful Conditions. These Scientific Approaches Can Help.
[16] Walker S.O., (2020). Teachers Are Living in a Tinderbox of Stressful Conditions. These Scientific Approaches Can Help.
[17] Delgado N.B. et al., (2019). Restorative Justice as Practiced in School: A Study of an Inclusive School's Approach in Developing the Socio-Emotional Skills of Children with Special Educational Needs.

However, if in previous years the teachers acted as the key facilitators of this process among their students, & parents to resolve issues & conflicts, this time the focus shifted to teachers themselves under the NEW normal context the through Weekly Virtual Circle.

This ethnographic case study focused mainly on how, under pandemic context, MindHaven School's Brain-Based Triad program-(Home-base, School-Based, and Community-Based Program) Progressive Inclusive Program responds to teachers' Mental health needs by creatively employing the Modified, & Integrated Socio-Emotional Learning & Restorative Justice Practice, using the a) Taxonomy of Academic & Behavior Intervention Framework for students; b)The Zones of Regulation Framework c) The Transtheoritical Model (Stages of behavior) to monitor the total wellbeing of the teachers, while observing the same basic practices & process through Weekly Virtual Circle.

WHAT ARE THE ZONES OF REGULATION?

The Zones of Regulation framework and curriculum teaches students scaffolded skills toward developing a metacognitive pathway to build awareness of their feelings/internal state and utilize a variety of tools and strategies for regulation, prosocial skills, self-care, and overall wellness. This includes exploring tools and strategies for mindfulness, sensory integration, movement, thinking strategies, wellness, and healthy connection with others. The Goals of the Zones Curriculum for the students and for teachers are: Identifying their feelings; Understand their feelings in context; effective regulation tools; when & how to use tools; problem solve positive solutions; understand how their behaviors influence others' thoughts & feelings and ultimately move towards Independent Regulation.[18]

The Taxonomy of Intervention Intensity was developed based on existing research to support educators in evaluating and building intervention intensity and considering the integrated academic and behavioral supports needed by many students with intensive needs.[19]

The Transtheoretical Model (also called the Stages of Change Model), developed by Prochaska and DiClemente in the late 1970s), It focuses on the decision-making of the individual and is a model of intentional change. The TTM operates on the assumption that people do not change behaviors quickly and decisively. Rather, change in behavior, especially habitual behavior, occurs continuously through a cyclical process. The TTM is not a theory but a model; different behavioral theories and constructs can be applied to various stages of the model where they may be most effective.[20]

Thus this study aims to explore "1. How MindHaven School's Brain-Based Triad program (Home-base, School-based, and Community-based Program), Progressive Inclusive Program responds to teachers' Mental health needs under Covid-19 by creatively employing the Modified, & Integrated Socio-Emotional Learning & Restorative Justice Practice ,using the a) Taxonomy of Academic & Behavior Intervention Framework for students; b) The Zones of Regulation Framework c) The Transtheoritical Model (Stages of behavior) to monitor the total wellbeing of the teachers, while observing the same basic practices & process. 2. How did the teachers' respond personally & professionally to the modifications done in the Socio-Emotional Learning Program.

[18] *Kuypers L., (2011). WHAT ARE THE ZONES OF REGULATION?*
[19] *Fuchs, L. S. et al., (2017). The Taxonomy of Intervention Intensity. TEACHING Exceptional Children, 50(1), 35–43*
[20] *LaMorte W.W. (2019). The Transtheoretical Model (Stages of Change). Boston University School of Public Health. p.6.*

METHODOLOGY

A. Research Design and Data Collection Procedure and Analysis.
B. This study used Ethnography as it is a type of social research involving the examination of the behavior of the participants in a given social situation and understanding the group members' own interpretation of such behavior. The data of this research was collected through in-depth and semi-structured interviews with the study participants, 12 teachers of MindHaven School whose ages range from 22-66 years old, all women. Online observations, focus group discussions, Staff Meetings & development, journal, document and archival explorations of Weekly virtual Zoom meetings. All these methods were used to craft communal and substantive accounts grounded on the stories of those who were deeply involved in these sessions. The researchers analyzed the data using Creswell's analysis in an ethnographic way and were engaged in the process of moving in analytic circles that go spirally upward, a process that allows one to produce a continually more detailed analysis.
C. Setting. This study took place in MindHaven School Inc. It is a small, not-for-profit, inclusive private school offering Pre School and Grade School education services that earned government recognition in 1997, the same year that it offered Special Education services for the first time, starting with one child with autism and in 2007, the school's Elementary Level gained government recognition. The school "Whole Child, Whole School, Whole Community" Inclusive Program is a brain-based, research-based, evidence-based, practice-based, activity-based, play-based inclusive curriculum which incorporates and integrates principles from the latest in education research such as, among others, Multiple Intelligences Theory, Whole-Brain Learning, Learning Styles, Socio-Emotional Learning, Multi-Grade Program, Education for Sustainable Development, and Environment- Based and Culture-Based Education, eventually resulting in a developmentally-appropriate holistic program tailored to each child's uniqueness while cultivating him/her intellectually, emotionally, spiritually, physically, and socially. Lessons, activities, and programs are designed for children to use their creativity while developing their imagination, dexterity, tenacity, compassion, critical thinking, problem-solving skills, and physical, cognitive, and emotional strengths.

FINDINGS

The Socio-Emotional Learning Program with embedded Restorative Justice Practices for teachers were modified to become a safe venue for teachers to an have intimate facilitated space for themselves to sustain Teachers' Socio-Emotional Learning even amidst Pandemic. Through WEEKLY VIRTUAL CIRCLE sessions, this aim to mitigate mixed mental health challenges of extreme stress, exhaustion, & dis engagement during Covid -19. Thus the following modifications: These modifications are reflected in this framework:

FROM BEFORE COVID TO DURING COVID:

The framework shows the Process of modifications for the SOCIO-Emotional Learning Program to respond to the needs of the teacher:

Figure 1. Management Cycle

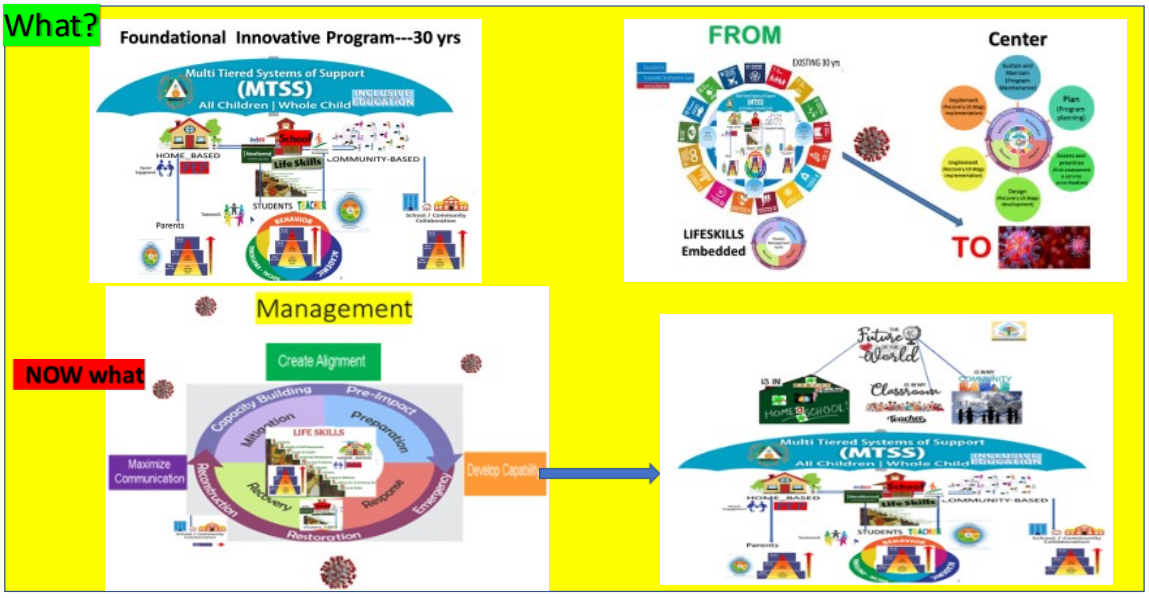

Figure 2. Planning to Evaluation

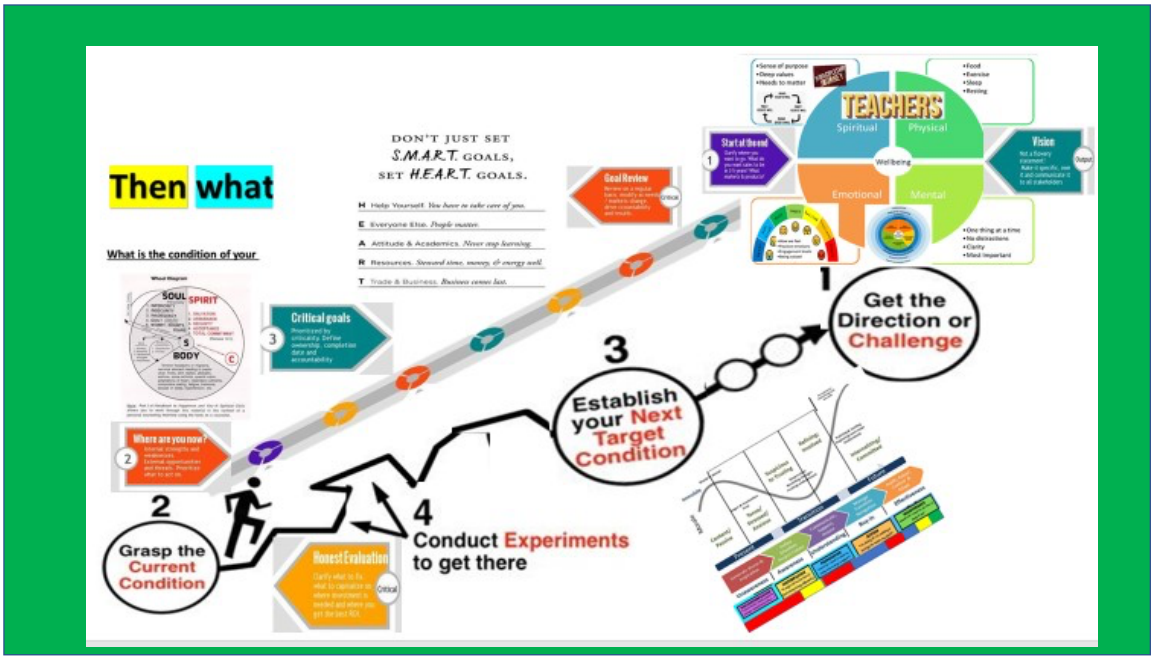

Figure 3- Teachers Modified SE Curriculum sustaining existing Inclusive Program

Since MSI adopted the CASEL 5 & that it can be taught and applied at various developmental stages from childhood to adulthood and across diverse cultural contexts the modifications were the following:

1. SHIFTING OF TARGET PARTICIPANTS- From students to teachers is the most crucial bases of Modifications of CASEL 5 by using the Developmentally Appropriate checklist.
2. DISASTER MANAGEMENT CYCLE : From Embedded to Center-- Sustaining The Whole Triad Program -by observing the General Framework of Management Cycle -from Planning , Implementation, Progress Monitoring, Assessment & Evaluation but with Disaster Management Cycle at the center of the management process described in the following;

A. Planning – Intentional Intensification for Teachers both as facilitators & as participants Sustained Brain-Based Learning Principles & strategies as an umbrella of the Triad Program; facilitating the sessions using Zones of Regulation Intervention tools; Framework of Intervention to both participants: Taxonomy of intensified Academic & Behavior Intervention based on the gathered data of both the students & the teachers. This is the bases for goal setting of both the students & teachers.

- **For students** - Outcome: PLOP- (Present Level of Performance) Identifying their current life assets Holistically in terms of strengths, weaknesses & limitations & setting goals for comprehensive personal & family relationship to team playing in professional development.

- **For Teachers** - Outcome: Data -Based PPPLSCP - Present Personal & Professional Learning & Self –Care Program- that intentionally & holistically respond to their identified physical, mental, emotional, social & spiritual needs.

B. Implementation – FROM students to teachers

- Sustained
  - Existing modified Multi -Tierred System of Support & Response to Intervention framework by utilizing the Taxonomy of Intervention CONTENT & DELIVERY
  - Universal Design for Learning; Differentiated Curriculum
  - Modified & comprehensive SE curriculum & Christian Discipleship curriculum that correspond to their age for individual & professional holistic needs.
- Increase one-on-one coaching in practicing the Kolbe Cycle of Experiential Learning as a teaching strategy in the Transfer of Knowledge stage by acquiring, learning, practicing & modeling to develop the skills.

C. Progress Monitoring – Transtheoritical Model as guide for individual & personalized monitoring of their Progress & to identify the specific gaps & needed actions between their present SE skills to what target SE skills they need to develop.

- **For students**: Sustained. it is usually done both through informal & structured feedback feed forward or through the channel of communication set up by the school such as Group Chat , Private messaging with their grade level teacher; from synchronous recording & asynchronous data from class dojo, journals, modules & other documents .

- **For teachers**: Increase per department daily informal communication with their Accountability partner & weekly virtual circles are also feedback sessions coming from team members. This model is used to gauge the progress or changes in mindset & behavior from one stage to the next reflected in application & Attention to Transfer -from specific to general application- of the Spiritual Growth curriculum. To identify the specific gaps & needed actions between their present SE skills to what target SE skills they need to develop- using the Transtheoretical Model as guide.

D. Assessment- Sustained for students; Increase Frequency for teachers

Developmentally Appropriate Socio-Emotional Learning checklist matching it with their Present Level of Personal& Professional Learning & Self-Care Program in learning- to identify , express their feelings & be aware of their daily level of alertness, understand their feelings in the new context, became aware of what, when , how & why use the tools, problem solve positive solutions; transform conflicts; understand how their behaviors influence others thoughts & feelings,& ultimately strengthen these skills to self-regulate.

E. Evaluation— Sustained Process based on the Teachers target goals to be developed in Socio -Emotional Learning competencies as a one of the stakeholders who embody the ideal characteristics & personality of implementors of the Mission, Vision , Goals of the School as an Inclusive Progressive Program with its Home-Based, School-Based, & Community-Based Program.

- Desired outcome - that the Teachers developed Socio-Emotional Learning Competencies can be manifested in their daily life not only personally & professionally but more importantly they can MODEL and DUPLICATE these skills to their families, to their colleagues, and to the community.
- Innovative program- Inclusion for teachers, accepting their DIVERSE various religious background & affiliation for Spiritual Growth.

The coronavirus pandemic, like many cataclysmic events of the past, has enhanced the appeal of faith and the notion of some sort of greater power. At a time of profound chaos, months or years away from a vaccine and seemingly a million miles from our former lives, some turn to faith "recent social upheaval have provided the optimal opportunity to embrace spiritual practices as a way to feel more whole and even healthy. "People are looking for guidance to feel better in their bodies, for confidence, and for higher meaning in their life.[21] One possibility is that religiosity reduces the negative effects of insecurity and stress. Several studies have documented the health benefits of religion for stress related illness such as high blood pressure [22] and depression[23]. Religious stress buffering could operate either through social support mechanisms [24], cognitive coping mechanisms or both.[25]

In MindHaven's School context whose team of teachers, although from different religious affiliations, is practicing Christian faith, the group adopted Christian Discipleship to be integrated in this revised Socio-Emotional Learning. This Weekly Virtual Circle sessions is the school's vehicle for the teachers so as not to disrupt ongoing professional training instead sustain social-emotional competencies they already have gained like strategies for self-regulation, healthy collaboration and stress management) Inclusion for Teachers:

Respecting their diverse background and religious affiliation by adopting Christian Discipleship as Spiritual curriculum. Its objective is to help the teachers understand, realize, reflect on the value & meaning of life & death beyond everyday realities. The deepening sessions are comprehensive & continuous individual exploration, deepening of science & faith to answer the question "WHY you believe WHAT you believe" and NOT just on blind faith or a pass-on/generational faith.

Since all teachers are Christians from different religious affiliations they unanimously agreed to adopt Christian Discipleship as their curriculum for Spiritual Curriculum

Discipleship Definition[26]

The Gospel Message in the Early Church presents a more detailed explanation of biblical discipleship: "Becoming and being a flourishing follower of Jesus who embodies the character of Christ by engaging in a lifelong, personal pursuit of holistic transformation and doing so within a like-minded community of faith that's corporately committed to being and making other disciples."

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[26] Fairchild M., (2019). How Does the Bible Define Discipleship?

- Behavioral support : Intentionally plan ,practice apply , monitor Weekly Circle sessions' of self- regulation skills & spiritual disciplines by duplicating & modeling these at home, with their students, in their team in school & in the community.

WHAT ARE THE TEACHERS' RESPONSES TO THE MODIFICATIONS PROCESS?

The teachers' respond personally & professionally with mixed thoughts & emotions to the modifications done in the Socio-Emotional Learning Program.

Generally, the Modified & Integrated Socio-Emotional Learning Program for the teachers through the Weekly Virtual Circle Sessions turned out to be a Transformative process which strengthens MSI teachers' caring, compassionate & responsive relationships. However, as they have to go through the process- from formulating their own Personal learning self -Care Program to the evaluation phase, these modifications solicited **mixed responses** from the teachers as they go through the stages of behavior from Pre-contemplation to Maintenance stage. From being the target participants instead of being the facilitators, the teachers express appreciation because such processes offered a venue for them to experience, learn & develop their Socio-Emotional Competencies in the following areas:

1. **To strengthening participatory environment**-- teachers find the first few sharing sessions awkward, some feel intimidated & reserved when asked about their feelings but in succeeding sessions they started to feel that the climate fosters trust so they feel respected, supported, and engaged.

"at first I don't want to share my emotions & concerns for fear of being judged. I thought I would hide my weaknesses but now I feel valued & respected"
"We are collaborating with each other. And I am not afraid or shy to tell all my problems in the group. I'm very open to tell all your problems and everything. I can do some activities that it would be helpful to the children in his/her life"

Adapting to change usually takes time even under normal circumstances. It is much harder especially when it is imposed on us & there is no other option available like pandemic times. Common feelings of being demotivated, angry, disillusioned make people vulnerable to wallow in self -pity eventually depression. To most people what helps them to bounce back is when there is a support group to help them face reality, develop trust in yourself again & that they are valued.

2. **To deepening relationships**—they understood that emotions matter in any relationship; how one feels & interpret the feelings of others sends signals people to either approach or avoid us. They also came to be aware of their own pattern of automatic reactions of fight, flight, freeze or fawn. In contrast dysregulated emotions can be barriers to healthy relationships among themselves & also to their own families & students. Some even shared their traumatic childhood experiences.

"I was the kind of person that doesn't care about the people around me, how they feel;, sympathy and empathy were not on my vocabulary, even to the point that I do not want to be corrected, that I know everything and I don't want others opinion .I am so insensitive
"I made an impact to my family by sharing them how to pray intentionally.
"I was distant in the past because I don't want to be the "center" of attention but now learning these skills helped me formed new perspective about relationship building."

Navigating a crisis with mixed emotions is a difficult process but accepting one's weaknesses & limitations. This actually help individuals also discover their sense of identity, their importance as a team player in a workplace community by taking off their masks & revealing their real selves only to realize that they are not alone in their desire to establish & deepen relationship with their family& with their colleagues.

3. **To promoting inclusive school culture**- acceptance of their diverse background, opposing ideas & different religious beliefs produced sense of belonging, which plays a crucial role in their engagement to every session which offers an opportunity to enhance existing school-wide systems incorporating Socio-emotional practices.

"I am thankful and blessed because, through this, I can see the best version of myself. And in return, I wanted to help other people by introducing God to them, include people to let them know that we have HIM who is always there for us no matter who we are, This way people will be able to see the goodness within themselves."

"I feel safe in this environment. I am accepted regardless of who I am wherever I come from" Culture Is about Connections of people feeling "belongingness "sharing the same values, perceptions & practices. In MSI's culture, there are many, overlapping, and cohesive interactions among stakeholders of the organization. This interactions result to integrating the organization's distinctive character of passion & compassion in their personal & professional lifestyle so it is widely spread and reinforced.

4. **To forming authentic inclusive & collaborative partnerships with parents** - - they realize that building strong connections reinforces strong school & family relationships. Teachers acknowledge that families and caregivers are children's first teachers, and they have expertise about their holistic needs & development. Their contributions, engagements, perspectives are crucial to supporting, and sustaining not only their children's but all stakeholders SEL.

"each one has a role to play & can contribute to the overall mental health of team members".

Fundamental beliefs and assumptions like "All means All & All children can learn" are things that people in MSI community consider to be true. These perspectives are then translated into school norms & demonstrated in how teachers act & behave with their students, with the parents & among themselves thus tangible evidence -visual, auditory, physical & social interactions are the results of what are intangible -the authentic, collaborative & Inclusive partnership that prevails in the school.

5. **To the rigorous & intentional ongoing planning, implementation, evaluation**, and continuous improvement by all members of the school.- -They experience & practice "-Teachers Voice/Agency"

"The topics helped me to intentionally learn & develop specific skills. These helped me to be productive personally & professionally."

"These sessions remind me to pray not just because I need something or want something to happen but to also to thank Him that I wake up every day, I have food in my table, I have something that I can share to others, appreciate these blessings."

The primary goals in the school is for students and staff members to feel emotionally and physical safe as reflected in school's policies and facilities promoting students .Abreast with this also is the belief to develop teachers & students responsibility & accountability both in Academics & Socio-Emotional Learning so the rigorous & intentional cycle of planning to evaluation is observed consistently.

6. **To the continuous use of the SE Zone of Regulation Intervention Tools & monitoring their progress through the Transtheoritical Model** ---they feel empowered knowing that they are trained to apply these tools whenever, & wherever they need these in real -life situations.

"It also helped me developed and improved my self-growth, self-regulation, self-awareness and self-management"

Every single day will always be an opportunity to learn new things, learn from yesterday's mistakes and opportunity to plan ahead for the future.
THE ZONES OF REGULATIONs Teaches both teachers & s students: Vocabulary of emotional terms; How to recognise their own emotions ;How to detect the emotions of others (read others' facial expressions); What may trigger certain emotions; How others may interpret their behaviour; Problem solving skill. With these tools it is believe that they can demonstrate what Charles Swindoll said "Life is 10% what happens to us and 90% how we react to it".

CONCLUSIONS

Many times the process of asking colleagues about feelings can be intimidating & intrusive but this experience shows that when schools have the courage to explore & initiate innovative program they could be more prepared to face unanticipated challenges even a crisis like covid-19. This MSI'S Teachers Weekly Virtual Modified Socio-Emotional Learning Session would not have been more responsive to teacher's mental health challenges personally & professionally under pandemic times if the SE & RJ Program have not been established in the previous years.
This Modified Integrated Holistic Socio-Emotional E weekly sessions benefited the teachers in three levels as:

1. **Holistic Personal support** -- as these circles are congruent with mental, emotional, physical, social sciences & spiritual upliftment have been stimulating & supporting to teachers healthy lifestyle practices; from breathing exercise, to using Zones of Regulations tools, to meditation on their bible reading & practicing spiritual disciplines

2. **Professional Support System**-- this is continuously sustaining the TEAM's high-quality relationships already established even before covid -19 practicing intentionality of encouraging & supporting each other to step up from one stage of behavior to another.

3. **Family & community Support system**-- as teachers who have SE competencies, they are now "special ambassadors " of the school , to advocate,& duplicate themselves by modeling & Transferring these SE skills to their families & the community when opportunity allows it.

Consequently, these sessions helped the teachers promote deep human connection of acceptance & respect of each other's uniqueness & value while observing MSI's collective efficacy & collaborative RJ culture. All of these become the driving force in maintaining a holistic healthy habits thus building immunity serving as "Mother Nature's oxygen mask."[27]
The contribution of this Weekly Virtual Circles to the school -wide MSI program is substantially relevant to their integrative effort to complete the elements to contextualize the different Evidence -based approaches-from Academic to Socio-Emotional Learning Program- that the teachers have

[27] *Walker S.O., (2020). Teachers Are Living in a Tinderbox of Stressful Conditions. These Scientific Approaches Can Help.*

been previously applying primarily with the students & parents. Now, with their own version of personal & professional SEL learning applied to one social phenomenon especially under pandemic, which contexts require teachers optimized maintenance of functioning and performance, they feel more empowered & hopeful to face whatever challenges lie ahead in the coming days.

"What's real in the mind is real in the body, and it is our perceptions not "objective" reality that drives our biochemistry. Accordingly, finding a silver lining even under the direst of circumstances instigates a biochemical "upward spiral" which fosters constructive thinking in a demanding moment and, over the long-term, protects health and psychological well-being."[28]

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Schedule for Oral Presentation Session

June 25th, 2021 (13.00 – 15.00 p.m.)

Session Chairs 1. Asst. Prof. Natee Chiengchana, Ph.D.
2. Dr. Sunanta Klibthong

Staff 1. Ms. Piyanuch Nuchbunchuay
2. Ms. Thitirat Weerawong

Time	Title	Presenter(s)
13.00 - 13.20	Warm or Cold color? The suitable colored background for Thai sign language on TV screen	Waiyawut Wuthiastasarn, Thailand
13.20 - 13.40	Students' Self-evaluation and Progress in Various Forms of Learning -- Towards a Shining Tomorrow for Everyone Through Practical Education	Tsutomu Araki, Haihan Liu, Mingfu Cui, Yuko Shiraki, Jin Tatsuoka, Kazuko Akaishi, Kazuki Kanbe, Maho Okada, Japan
13.40 - 14.00	The Development of English Braille Literacy for the Students with Visual Impairment by Using an Activity-based Learning Method	Vichita Chaovanajinda, Issavara Sirirungruang, Wiraman Niyomphol, Thailand
14.00 - 14.20	History of research and development of the finger joint rehabilitation device in Japan in the past decade	Shigeo HIRANO, Susumu KISE, Sozo SEKIGUCHI, Kazuya OKUSAKA, Tsutomu ARAKI, Japan
14.20 - 14.40	Quality of Life among Caregivers of Children with Language Impairment at the Division of Developmental and Behavioral Paediatrics Faculty of Medicine Vajira Hospital: a Cross-Sectional Descriptive Study	Natwipa Wanicharoen, Thailand
14.40 - 15.00	An Ethnographic Study on Socio-Emotional Learning Program under the COVID-19 Pandemic: Teachers' Perspective	Jan Jade N. Tabasa, Nilda B. Delgado, Diana Grace S. Ariz, Philippines

Organizing Committee

1. Wachara Riewpaiboon, M.D., MSc.	Consultant
2. Sunanta Klibthong, Ph.D.	Chairman
3. Asst. Prof. Teerasak Srisurakul, Ph.D.	Committee
4. Asst. Prof. Natee Chiengchana, Ph.D.	Committee
5. Assoc. Prof. Nuttaneeya Torugsa, Ph.D.	Committee
6. Asst. Prof. Piyarat Nuchpongsai, Ph.D.	Committee
7. Paranee Visuttipun, Ph.D.	Committee
8. Issavara Sirirungruang, Ph.D.	Committee
9. Ms.Tidarat Nongthong	Committee
10. Mrs.Salisa Sri-in	Committee
11. Mr.Mana Prateeppornsak	Committee
12. Ms.Piyanuch Nuchbunchuay	Committee
13. Ms.Chalita Rainua	Committee and Secretary
14. Mr.Wattunyou Thesasiri	Committee and Assistant Secretary
15. Ms.Wannarat Tapkaew	Committee and Assistant Secretary
16. Ms.Thitirat Weerawong	Committee and Assistant Secretary

Mahidol University
Ratchasuda College

111 Moo 6 Phuttamonthon 4 Road,
Salaya, Nakon Pathom 73170
Tel. (66) 2889 5315–9
Fax. (66) 2889 5308
http://rs.mahidol.ac.th