Proceeding ICHELSS 2021, March 25-27, Jakarta, Indonesia
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ISBN: 978-623-92475-1-5

Research on the Feasibility of Original Theory and System Practice of Child-Computer Interactive Emotion Detecting and Counseling System

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Abstract: AI in emotion detection system is a non-intrusive human-machine interaction. The purposes of this study are to develop 40 Sandwich-Dialogue Approach (SDA) animations and to verify its impacts on emotion reaction. The underlying theoretical foundation of SDA is that speaking tone, attitude and rhetoric cause others' emotion response and accordingly result interpersonal problems. SDA comprises empathy, strengths finding, discussion possible solutions and its impacts on emotion. It is crucial to foster children possessing SDA for a harmonious interpersonal relationship, a positive self-concept, life-long happiness and life-span achievements because early childhood is the critical period of preparing habits, attitudes and characters. This study develops an innovative "Sandwich-Dialogue-Based Emotional Development Theory" with concentration on adults enhancing SDA rather than scolding child's emotional responses. This is a direct study that child's emotion is directly detected by Emotional Detection System, so does the SDA. To achieve the goals, the researcher develops 40 SDA animations based on Emotional Competency Rating Scale for Young Children. There are 196 parents/teachers participated in the SDA training and moreover Emotional Detection System directly detected 189 children's emotions. These data were collected by the operational platform designed by this study and were automatically calculated by t-test and reliability analysis on Emotional Detection System and SDA. The main findings are that (a) the children's emotional ability scores have improved significantly relying on the treatment of "Sandwich-Dialogue-Based Emotional Development Theory" ($p < .001$); (b) the reliability is .987 for Emotional Detection System and .973 for SDA. "Sandwich-Dialogue-Based Emotional Development Theory" enhance adults' SDA and accordingly children improve their emotions. "Sandwich-Dialogue-Based Emotional Development Theory" contributes to an innovative emotional development theory that the way how adults stimulate children causes the way how children react to emotions.

Keywords: *Sandwich Dialogue Approach, Emotion Detection System, Emotion Development*

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Introduction

Among community services, virtual life-long learning services are a new facility. With the increase of small families, the community care services provided for family caregivers support the functions of parenting or teaching skills. It serves as a basic virtual community service to provide for families in need of individual learning, home schooling, after-school programs or a community care system. For this reason, this study focuses on using AI or online mass media facilities to build up the training parenting and caring skills program for parents, family caregivers, and school teachers to conduct the parenting or caring skills. Few empirical studies have explored the relationship between Sandwich Dialogue Ability (SDA) and children emotion ability. Emotion is a person's response to a stimulus. Parents and teachers usually complain about their children's poor emotional performance. They do not reflect in their speaking tone, words and attitude. This causes discomfort to the child or student. This is where the problem lies. Children's emotion can reflect what the teachers and parents say or do to their children (Duncombe et al., 2012; Kolko & Kazdin, 1993; Lunkenheimer et al., 2007; Stanger & Lewis, 1993). Parents and teachers discuss with children by SDA that makes children's emotional development better. The first component of SDA is empathy that makes a child feel being understood. Parents and teachers need to understand how their children feel (Ahn, 2005; Goroshit & Hen, 2014; Hen & Sharabi-Nov, 2014; Kirby, 2020). The second component is to find out a child's strengths whenever the child makes a mistake. Encouragement makes the child feel confident in solving problems by himself (Roberts & Strayer, 1996; Spinrad et al., 1999; Denham et al., 1994; Garner & Waajid, 2008; Brooks, 1994; Jiang et al., 2019). This can lead, for children, to gain higher scores of both emotional competency and problem-solving ability (Kang et al., 2012; Lam & Kirby, 2002; Lester et al., 1989; Meyer & Ostrosky, 2018; Stake, 2006; Zimmerman & Ringle, 1981). In summary, there are three purposes of the study. (a) Develop 40 animations of EDS and SDA. (b) Verify the reliability and validity of EDS and SDA. (c) Analyze the relationship between EDS and SDA. The significances of the study are to develop (a) an emotional lexicon for children, (b) an original SDA theory, and (c) a platform.

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Literature Review

The literature indicates that gamification enhances children's engagement (Fadhli et al., 2020; Francisco-Aparicio et al., 2013; Mullins & Sabherwal, 2018; Oppenheim & Koren-Karie, 2009). However, few studies have investigated game-based direct emotion detection. Related studies found that parent-child dialogue can influence children's emotional development, such as self-confidence and secure attachment (Ackard et al., 2006; Strayer & Roberts, 2004; Volling et al., 2002). Furthermore, parents' emotional expressions have a positive correlation to a child's emotional development (Strayer & Roberts, 2004). Teachers' emotions and behavior in class strongly influence and can even predict the emotion of the students (Brackett et al., 2011; Denham et al., 2012; Hagenauer et al., 2015). Do children's emotional abilities improve after parents and teachers participate in SDA training? Are the instruments of the research reliable? To achieve the main aims of this research, this study created an online platform, as shown as Figure 1. It indicates that the study develops a platform with the functions of analysis and graphical results. The database is update on a regular basis. The study verifies the relationship between the Emotional Competency Rating Scale for Young Children (ECRYC) and the SDA ability of parents and teachers.

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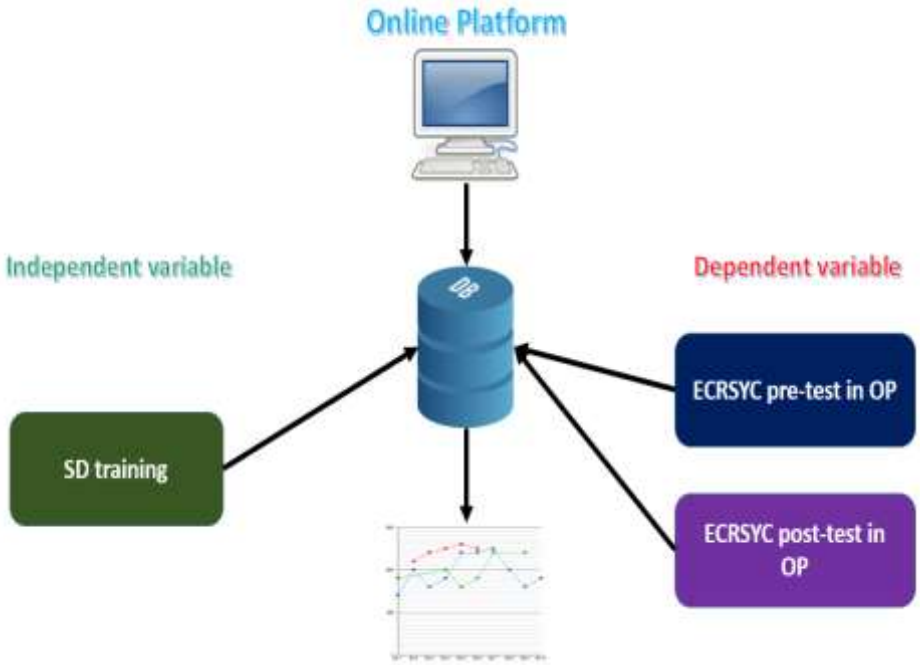
Figure 1
The structure of the online platform



Research Methods

This study mainly aims to encourage life-long learning and improve daily conversation habits by using SDA. Emotion is a response to stimulus. High levels of SDA (stimulus) in parents and teachers cause better development of children's emotions (responses). SDA can achieve a "positive self- concept and harmonious interpersonal relationships," which are the contemporary educational goal of humanism in the 21st century.

Emotion detection is basically divided into speech recognition and facial recognition. Both of these methods are very effective in detecting a person's emotional state. Speech recognition uses human tone, words, and rhetoric to determine emotions (Yu et al., 2001; Kim et al., 2007; Han & Tashev, 2014; De Silva et al., 1997). Facial recognition applies an AI deep learning technique to recognize the expression of emotion (Maglogiannis et al., 2009; Habel et al., 2007; Manaswi, 2018).

For the EDS (Figure 2), this study has two methods (speech recognition and facial recognition). In the first year, the researcher applied the Microsoft Azure Speech API (Yoon et al., 2019; Magyar et al., 2018; Wei, 2019b) and the Microsoft Azure Text-Analytics API for speech (Wei & Lee, 2019). This study assumed that an emotion lexicon plays an important role in speech recognition, but related studies lack an emotion lexicon for children (Wei, 2020; Xu et al., 2010; Yang et al., 2007). Consequently, the researchers established an emotion lexicon for children (Wei, 2019a). Previous studies have utilized the Microsoft Azure Emotion API for facial recognition (Chatzakou & Vakali, 2015). Therefore, this study adopts a direct method for detecting emotion. In the second year, the researchers decided to create an OP for SDA and EDS analysis. We designed 40 animations for SDA and the EDS to give users better experiences (gamification). Moreover, the researcher used the OP's DB analysis to build up the reliability of the study instruments (SDA animation and EDS). Finally, we analyzed the improvement of children's emotional ability after a series of SDA training sessions for parents and teachers.

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The EDS is to directly detect the child's emotion, and it indicates that EDS composed of facial expression and speech recognition (Figure 2). After the research finished setting up two emotion detectors (speech recognition and facial recognition), the instruments of this study were created. The OP provides 40 daily situations in kindergarten classes. Initially, we used a camera to record in-class sessions (Figure 2), because the classroom had too many students who were out of control or too noisy. Therefore, we created 40 SDA animations (Figures 3 and 4) to create a better experience for users and help them understand the content more easily. The researcher established a database (Figure 5) for the OP to save and analyze the data collected from the emotion detectors. Furthermore, we developed a program for the database to automatically analyze the children's emotion differences from the pre- and post-test (Figure 6).

Teacher traditionally told children stories related to 40 emotional problems frequently occurred in kindergartens (Figure 3). Accordingly, the study developed 40 SDA training animations shown as Figure 4. The first of all, SDA is to be empathic by taking understanding of how children feel or think. In the second step, is to find the child's strengths even in cases of failure in order to build children's confidence. In the third step, parents and teachers ask questions to inspire children to think about how to solve problems by themselves.

Figure 2
The structure of EDS

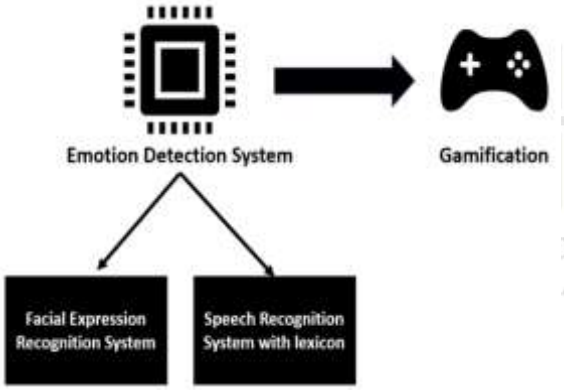
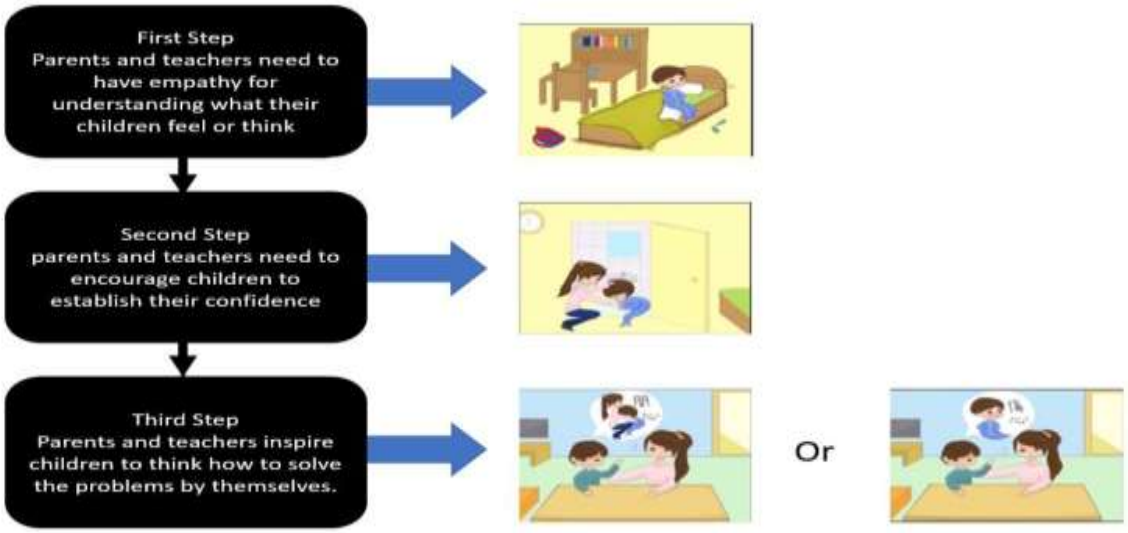


Figure 3
The teacher administered problem-based teaching for 40 emotional competencies

Figure 4
The process of the SD training



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Secondly, the SDA uploaded and saved on YouTube. The 40 SDA training animations were provided in the platform developed by this study (Figure 5). The platform shown in the interface design as above. The subjects can enter his/her name in the blank entitled "User name". The test results are shown graphically. The result can be displayed in a table or graph (Figure 6).

Thirdly, the program code of data analysis from the database. The collected data are automatically analyzed by the database of the platform. The results are shown in tables on the right-hand side (Figure 7).

Figure 5
The study develops 40animations of SD training according to the ECRYC

Figure 6
The interface design of the database

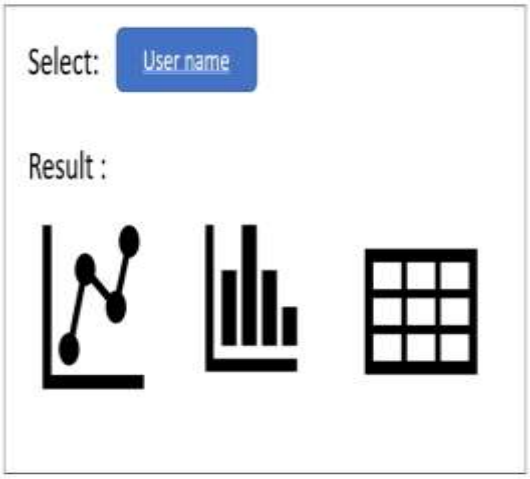

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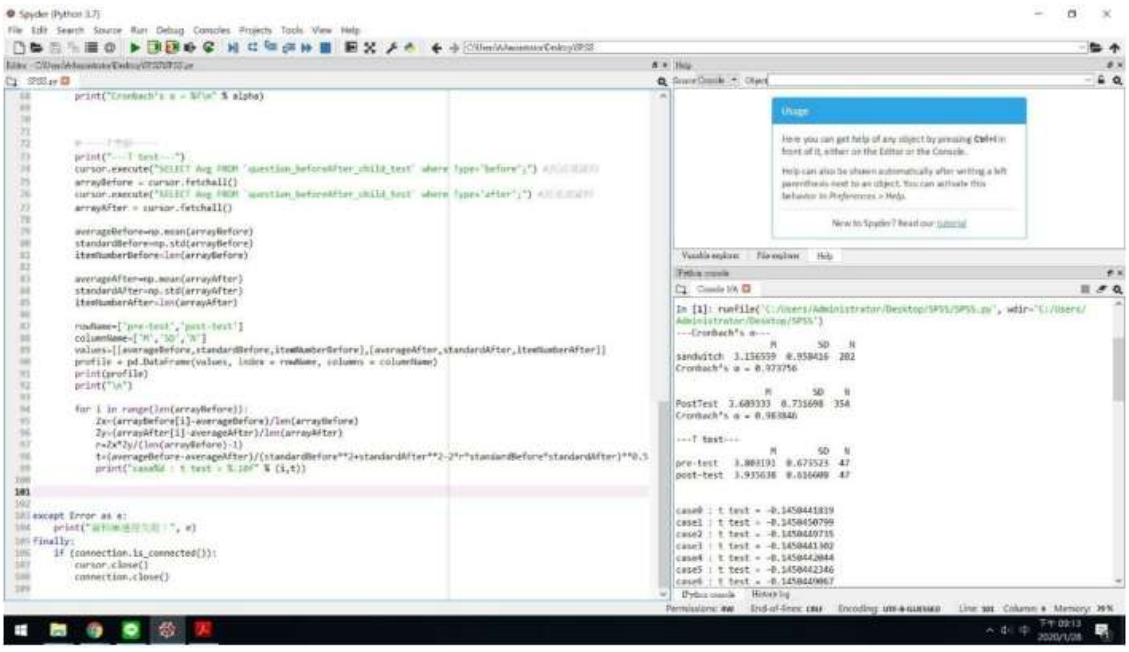
Figure 7
Program code of data analysis from the database



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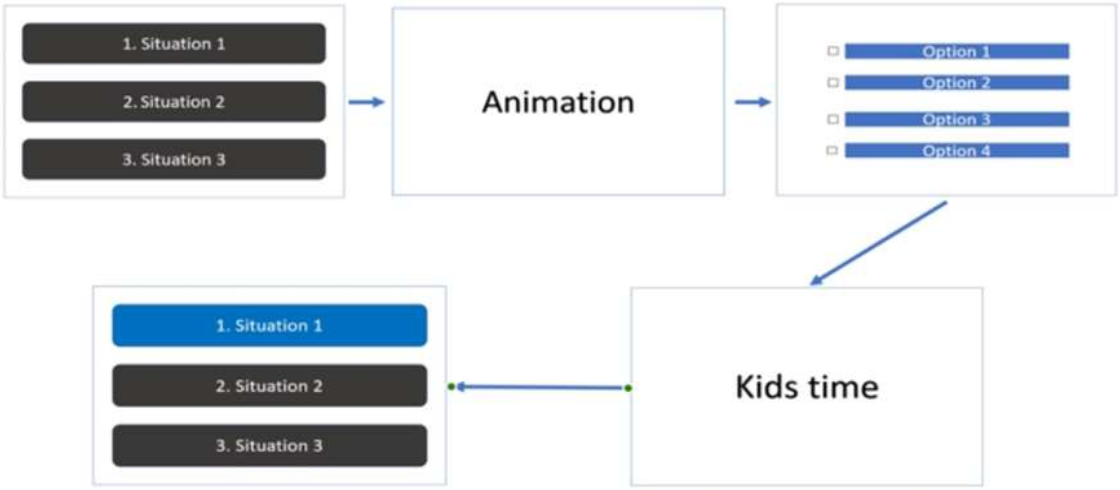
Finally, the administration procedure of the platform. Step 1. The participant needs to sign in and write the correct personal information on the blank. Step 2. The emotion detectors start to work when the OP identifies the user. Step 3. The screen shows the 40 SDA animations one by one after the participant signs in. Step 4. The children also participate in the third step of the SDA. The platform detectors are focused on the children's faces and speech to recognize the emotions. Step5. The children complete the 40 problem-based emotional learning exercises. The database analysis is then completed (Figure 8).

Figure 8
The administration procedure of the platform



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Findings & Discussion

The reliability of the SDA scale

The findings of the study are analyzed and the participants are 196 including 183 children's and their parents and teachers in the SDA training. The credibility coefficient of Cronbach's α is 0.973, which is a high reliability coefficient. The standardized Cronbach's α indicates that the influence caused by the unequal variation of each subject was considered. The positive coefficient is still 0.973, which means that the reliability of the entire scale is 97.3% (Table 1).

Table 1
Reliability analysis of SDA N=196

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Projects	Number of Items
0.973	0.973	40

The reliability of the EDS scale

The findings of reliability analysis on EDS indicate that a total of 189 children participated in the EDS, but one is a Missing data. The credibility coefficient of Cronbach's α is 0.987, which is a high reliability coefficient. The standardized Cronbach's α indicates that the influence caused by the unequal variation of each subject is considered. As a result, this study shows that the EDS and SDA animation led to high reliability coefficients. Therefore, this direct gamification of the EDS is unique and valuable (Table 2).

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Table 2
Reliability analysis of EDS N=188

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Projects	Number of Items
0.987	0.987	40

The t-test analyze of children's emotional ability

In SDA, there are 183 children in this study. The means of pre-test scores and post-test scores are 3.522 and 3.714, respectively. For the more, the t-test result that there is a significant difference between children's emotional ability before and after the SDA treatment (t= -3277.960***) (Table 3). The children's post-test scores (M=3.714) are higher than the pre-test scores (M=3.522), at a very significant level. Adults' participation in SDA significantly promotes children's emotional ability scores. SDA training includes empathy, encouragement, and dialogue. The pre-test and post-test results reached a significant difference. Related studies have also supported that parents' and teachers' empathy, encouragement, and discussion are helpful for children's emotional development. The findings of this study agree with the results of previous studies.

Table 3
The t-test of children's emotional ability scores between pre-test and post-test

Emotion Ability	N	Mean	Standard Deviation	t-value
Pre-test	183	3.522	0.788	-3277.960***
Post-test	183	3.714	0.740	

*p<.05, **p<.01, ***p<.001

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The impacts of SDA on emotional development

Findings indicate that children improve emotion abilities after parents and teachers participate in SDA Training. The SDA comprises the three elements of empathy, strength finding, and the encouragement of confidence and discussion so children can solve problems on their own. The findings are the same as those of related studies, as following.

1.The impacts of empathy

Parents and teachers need to understand how their children feel. Related studies support the findings of the study discussed as follow: Emotional intelligence and empathy have a positive relation (Alwaely, et al., 2020); teachers' empathy is one of the most important variables consistently related to students (Demetriou, 2018); teachers' empathy toward adolescents' emotional development has important implications for classroom management and teacher empathy training (Demetriou, 2018); and the relation between emotional expressiveness and empathy is important (Strayer & Roberts, 2004).

2. The impacts of encouragement

Encouragement effectively promotes children's confidence and emotional development. Related studies have also supported the same findings. Such as Denham, & Kochanoff (2002) pointed out that parents' positive affect and encouragement are positively related to children's emotions. Garner & Waajid (2008) said that positive relationships with teachers may encourage children to be sensitive to their emotions.

Moreover, encouragement heightens children's awareness of the emotion within parent-child interactions and motivates them to attend to and process this emotion (Sheridan, et al., 2010), and children' self-esteem and resilience are nurtured when caregivers

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communicate realistic encouragement to children (Plummer, 2007). Teachers and parents' encouragement boosts children's confidence (Pajares, 2008), and encouragement enhances self-esteem (Meškauskienė, 2013).

3. The impacts of problem-solving by children themselves

Findings support that teachers and parents should propose questions for children to figure out problem solving by themselves. Related studies also have obtained the same results as follows: The ability of young children to manage their emotions can improve problem-solving ability (Webster-Stratton, & Reid, 2004; Sahdat, et al., 2011; Gujral & Ahuja, 2011); emotion can increase performance and productivity (Lester, et al., 1989); emotional intelligence improves teamwork (Houtz, & Selby, 2009); and self-confidence is a key influencer of problem-solving behavior (Palavan, 2017).

Conclusion and Summary

SDA training. This study identified three elements of SDA: empathy, encouragement, and discussion of possible solutions. The findings support that the SDA improves children's emotions, and the reliability of SDA animation and EDS animation was also confirmed. Implications for practice: the OP can be applied for online registration and continuous use. The OP is a database that facilitates sustainable development, including personal life-span learning and growing portfolios. Adults should not complain about children's poor emotions but should reflect on their own problems through the SDA. The use of the SDA in daily life not only enhances children's emotional abilities, but can also improve interpersonal relationships at work and solve family problems. SDA can even be used to treat some patients with emotional illnesses. These findings suggest that on-going applications of big data and AIoT in emotional development and assessment, such as consultation and guidance, can be carried out. SDA emotional therapy should be patented in future work.

Appreciation

I am so thankful for the funding from the Ministry of Science and Technology that helps me to complete this study of MOST 108-2221-E-845-001-. I most appreciate the opportunity to attend the 1st ICHELESS 2021 sponsored by Asia University.

Bibliography

Ackard, D. M., Neumark-Sztainer, D., Story, M., & Perry, C. (2006). Parent–child connectedness and behavioral and emotional health among adolescents. *American journal of preventive medicine*, *30*(1), 59-66.

Alwaely, S. A., Yousif, N. B. A., & Mikhaylov, A. (2020). Emotional development in preschoolers and socialization. *Early child development and care*, 1-10.

Ahn, H. J. (2005). Child care teachers' strategies in children's socialization of emotion. *Early Child Development and Care*, *175*(1), 49-61. https://doi.org/10.1080/0300443042000230320

Brackett, M. A., Reyes, M. R., Rivers, S. E., Elbertson, N. A., & Salovey, P. (2011). Classroom emotional climate, teacher affiliation, and student conduct. *The Journal of classroom interaction*, *46*(1), 27-36.

Brooks, R. B. (1994). Children at risk: Fostering resilience and hope. *American Journal of Orthopsychiatry*, *64*(4), 545-553. https://doi.org/10.1037/h0079565

Chatzakou, D., & Vakali, A. (2015). Harvesting opinions and emotions from social media textual resources. *IEEE Internet Computing*, *19*(4), 46-50.

Demetriou, H. (2018). *Empathy, emotion and education*. Springer.

Copyright © FIS UNJ 2021
ISBN: 978-623-92475-1-5

Denham, S. A., Bassett, H. H., & Zinsser, K. (2012). Early childhood teachers as socializers of young children's emotional competence. *Early Childhood Education Journal, 40*(3), 137-143.

Denham, S. A., Zoller, D., & Couchoud, E.A. (1994). Socialization of preschoolers' emotion understanding. *Developmental psychology, 30*(6), 928. https://doi.org/10.1037/0012-1649.30.6.928

Denham, S., & Kochanoff, A. T. (2002). Parental contributions to preschoolers' understanding of emotion. *Marriage & Family Review, 34*(3-4), 311-343.

De Silva, L. C., Miyasato, T., & Nakatsu, R. (1997). Facial emotion recognition using multi-modal information. In *Proceedings of ICICS, 1997 International Conference on Information, Communications and Signal Processing. Theme: Trends in Information Systems Engineering and Wireless Multimedia Communications (Cat.*, Singapore, 1997, 1(1), 397-401., Doi: 10.1109/ICICS.1997.647126. IEEE.

Duncombe, M.E., Havighurst, S.S., Holland, K.A., & Frankling, E.J. (2012). The contribution of parenting practices and parent emotion factors in children at risk for disruptive behavior disorders. *Child Psychiatry & Human Development, 43*(5), 715-733. https://doi.org/10.1007/s10578-012-0290-5

Fadhli, M., Brick, B., Setyosari, P., Ulfa, S., & Kuswandi, D. A (2020). Meta-analysis of selected studies on the effectiveness of gamification method for children. *International Journal of Instruction, 13*, 845–854.

Francisco-Aparicio, A., Gutiérrez-Vela, F. L., Isla-Montes, J. L., & Sanchez, J. L. G. (2013). Gamification: Analysis and application. In V. M. Penichet, A. Peñalver, & J. A. Gallud (Eds.), *New trends in interaction, virtual reality and modeling*,113–116. Springer.

Garner, P.W., & Waajid, B. (2008). The associations of emotion knowledge and teacher–child relationships to preschool children's school-related developmental competence. *Journal of Applied Developmental Psychology, 29*(2), 89-100. https://doi.org/10.1016/j.appdev.2007.12.001

Goroshit, M., & Hen, M. (2014). Does emotional self-efficacy predict teachers' self-efficacy and empathy? *Journal of Education and Training Studies, 2*(3), 26-32. https://doi.org/10.11114/jets.v2i3.359

Gujral, H. K., & Ahuja, J. A. Y. A. (2011). Impact of emotional intelligence on teamwork–A comparative study of self-managed and cross functional teams. *International Journal of Multidisciplinary Research, 1*(6), 178-185.

Habel, U., Windischberger, C., Derntl, B., Robinson, S., Kryspin-Exner, I., Gur, R. C., & Moser, E. (2007). Amygdala activation and facial expressions: explicit emotion discrimination versus implicit emotion processing. *Neuropsychologia, 45*(10), 2369-2377.

Hagenauer, G., Hascher, T., & Volet, S. E. (2015). Teacher emotions in the classroom: associations with students' engagement, classroom discipline and the interpersonal teacher-student relationship. *European journal of psychology of education, 30*(4), 385-403.

Han, K., Yu, D., & Tashev, I. (2014). Speech emotion recognition using deep neural network and extreme learning machine. In *Fifteenth annual conference of the international speech communication association.*

Hen, M., & Sharabi-Nov, A. (2014). Teaching the teachers: Emotional intelligence training for teachers. *Teaching education, 25*(4), 375-390. https://doi.org/10.1080/10476210.2014.908838

Houtz, J. C., & Selby, E. C. (2009). Problem solving style, creative thinking, and problem solving confidence. *Educational Research Quarterly, 33*(1), 18.

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ISBN: 978-623-92475-1-5

Jiang, J., Vauras, M., Volet, S., & Salo, A. E. (2019). Teacher Beliefs and Emotion Expression in Light of Support for Student Psychological Needs: A Qualitative Study. *Education Sciences, 9*(2), 68. https://doi.org/10.3390/educsci9020068

Kang, G., Park, T., Han, S., & Park, J. (2012). The effects of an encouragement program on inferiority feeling and self-esteem of children. In *Computer Applications for Modeling, Simulation, and Automobile*, 317-324. Springer. https://doi.org/10.1007/978-3-642-35248-545

Kim, S., Georgiou, P. G., Lee, S., & Narayanan, S. (2007). Real-time emotion detection system using speech: Multi-modal fusion of different timescale features. In *2007 IEEE 9th Workshop on Multimedia Signal Processing*, 48-51. IEEE.

Kirby, J. N. (2020). Nurturing Family Environments for Children: Compassion-Focused Parenting as a Form of Parenting Intervention. *Education Sciences, 10*(1), 3. https://doi.org/10.3390/educsci10010003

Kolko, D. J., & Kazdin, A.E. (1993). Emotional/behavioral problems in clinic and non-clinic children: correspondence among child, parent and teacher reports. *Journal of child psychology and psychiatry, 34*(6), 991-1006. https://doi.org/10.1111/j.1469-7610.1993.tb01103.x

Lam, L. T., & Kirby, S. L. (2002). Is emotional intelligence an advantage? An exploration of the impact of emotional and general intelligence on individual performance. *The journal of social Psychology, 142*(1), 133-143. https://doi.org/10.1080/00224540209603891

Lester, F. K., Garofalo, J., & Kroll, D. L. (1989). Self-confidence, interest, beliefs, and metacognition: Key influences on problem-solving behavior. In *Affect and mathematical problem solving*, 75-88. Springer.

Lunkenheimer, E.S., Shields, A.M., & Cortina, K.S. (2007). Parental emotion coaching and dismissing in family interaction. *Social Development, 16*(2), 232-248. https://doi.org/10.1111/j.1467-9507.2007.00382.x

Maglogiannis, I., Vouyioukas, D., & Aggelopoulos, C. (2009). Face detection and recognition of natural human emotion using Markov random fields. *Personal and Ubiquitous Computing, 13*(1), 95-101.

Magyar, J., Magyar, G., & Sincak, P. (2018). A Cloud-Based Voting System for Emotion Recognition in Human-Computer Interaction. In *2018 World Symposium on Digital Intelligence for Systems and Machines (DISA)*,109-114. IEEE.

Manaswi, N. K., Manaswi, N. K., & John, S. (2018). *Deep learning with applications using python*. Apress.

Meyer, L. E., & Ostrosky, M. M. (2018). Identifying classroom friendships: Teachers' confidence and agreement with children. *Topics in Early Childhood Special Education, 38*(2), 94-104. https://doi.org/10.1177/0271121418763543

Meškauskienė, A. (2013). Schoolchild's self-esteem as a factor influencing motivation to learn. *Procedia-Social and Behavioral Sciences*, 83, 900-904.

Mullins, J. K., & Sabherwal, R. (2018, January 3-6). Beyond Enjoyment: A Cognitive-Emotional Perspective of Gamification. In *Proceedings of the 51st Hawaii International Conference on System Sciences*, Big Island, 1237-1246. Available online: http://hdl.handle.net/10125/50039

Oppenheim, D., & Koren-Karie, N. (2009). Mother-child emotion dialogues: A window into the psychological secure base, 142-165. Oxford University Press. Available online: http://doi:10.1093/acprof:oso/9780195326932.003.0006

Pajares, F. (2008). Motivational role of self-efficacy beliefs in self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications*, 111–139. Lawrence Erlbaum Associates Publishers.

Copyright © FIS UNJ 2021
ISBN: 978-623-92475-1-5

Palavan, Ö. (2017). Impact of drama education on the self-confidence and problem-solving skills of students of primary school education. *Kastamonu Üniversitesi Kastamonu Eğitim Dergisi*, *25*(1), 187-202.

Pianta, R. C., Hamre, B., & Stuhlman, M. (2003). Relationships between teachers and children. *Handbook of psychology*, 199-234. https://doi.org/10.1002/0471264385.wei0710

Plummer, D. (2007). *Helping Children to Build Self-Esteem: A Photocopiable Activities Book* (2nd). Jessica Kingsley Publishers.

Roberts, W., & Strayer, J. (1996). Empathy, emotional expressiveness, and prosocial behavior. *Child development*, *67*(2), 449-470. https://doi.org/10.1111/j.1467-8624.1996.tb01745.x

Rodrigues, M., Durães, D., Santos, R., & Analide, C. (2021). Emotion Detection Throughout the Speech. In K. Arai, S. Kapoor, & R. Bhatia (Eds.) *Intelligent Systems and Applications. IntelliSys 2020. Advances in Intelligent Systems and Computing, 1251*. Springer. https://doi.org/10.1007/978-3-030-55187-2_25

Sahdat, M., Sajjad, S. I., Farooq, M. U., & Rehman, K. (2011). Emotional intelligence and organizational productivity: a conceptual study. *World Applied Sciences Journal*, *15*(6), 821-825.

Sheridan, S. M., Knoche, L. L., Edwards, C. P., Bovaird, J. A., & Kupzyk, K. A. (2010). Parent engagement and school readiness: Effects of the Getting Ready intervention on preschool children's social–emotiona*l competencies. Early education and development*, *21*(1), 125-156.

Spinrad, T. L., Losoya, S. H., Eisenberg, N., Fabes, R. A., Shepard, S. A., Cumberland, A., Guthrie, I. K., & Murphy, B.C. (1999). The relations of parental affect and encouragement to children's moral emotions and behaviour. *Journal of Moral Education*, *28*(3), 323-337. https://doi.org/10.1080/030572499103115

Stake, J. E. (2006). The critical mediating role of social encouragement for science motivation and confidence among high school girls and Boys 1. *Journal of Applied Social Psychology*, *36*(4), 1017-1045. https://doi.org/10.1111/j.0021-9029.2006.00053.x

Stanger, C., & Lewis, M. (1993). Agreement among parents, teachers, and children on internalizing and externalizing behavior problems. *Journal of Clinical Child Psychology*, *22*(1), 107-116. https://doi.org/10.1207/s15374424jccp2201_11

Strayer, J., & Roberts, W. (2004). Children's anger, emotional expressiveness, and empathy: Relations with parents' empathy, emotional expressiveness, and parenting practices. *Social development*, *13*(2), 229-254.

Volling, B. L., McElwain, N. L., Notaro, P. C., & Herrera, C. (2002). Parents' emotional availability and infant emotional competence: Predictors of parent-infant attachment and emerging self-regulation. *Journal of family psychology*, *16*(4), 447-465.

Wei, W.J. (2019a). Development and evaluation of an emotional lexicon system for young children. *Microsystem Technologies*, https://doi.org/10.1007/s00542-019-0.

Wei, W. J. (2019b). Development of a database of the frequently used emotional vocabulary of 4~ 6 year olds. In *Proceedings of the ECEI 2019 2nd Eurasian Conference on Educational Innovation*, Kent Ridge Guild House, 27–29.

Wei, W. J., & Lee, L. C. (2019). Exploring augmented reality teaching aids in children's emotional learning. In *International Cognitive Cities Conference*. Springer.

Wei, W.J. (2020). AI and Big Data in Child's Emotional Assessment. In *Proceedings of the 3rd Eurasian Conference on Educational Innovation 2020*, Ha Long Bay, Hanoi, Vietnam, 5–7. URL: http://www.ecei.asia/

Webster-Stratton, C., & Reid, M. J. (2004). Strengthening social and emotional competence in young children—The foundation for early school readiness and success: Incredible years

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ISBN: 978-623-92475-1-5

classroom social skills and problem-solving curriculum. *Infants & Young Children*, *17*(2), 96-113.

Xu, G., Meng, X., & Wang, H. (2010). Build Chinese emotion lexicons using a graph-based algorithm and multiple resources. In *Proceedings of the 23rd international conference on computational Linguistics*, Beijing, China, 23–27 August 2010, 1209–1217. URL: https://www.aclweb.org/anthology/C10-1136.

Yang, C., Lin, K. H. Y., & Chen, H. H. (2007). Building emotion lexicon from weblog corpora. In *Proceedings of the 45th Annual Meeting of the Association for Computational Linguistics Companion Volume Proceedings of the Demo and Poster Sessions* (pp. 133-136), Prague, Czech Republic, 23–30.

Yoon, S., Byun, S., & Jung, K. (2018). Multimodal speech emotion recognition using audio and text. In *2018 IEEE Spoken Language Technology Workshop (SLT),* 112-118. IEEE.

Yu, F., Chang, E., Xu, Y. Q., & Shum, H. Y. (2001). Emotion detection from speech to enrich multimedia content. In *Pacific-Rim Conference on Multimedia*, 550-557. Springer.

Zimmerman, B. J., & Ringle, J. (1981). Effects of model persistence and statements of confidence on children's self-efficacy and problem solving. *Journal of Educational Psychology*, *73*(4), 485. https://doi.org/10.1037/0022-0663.73.4.485

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