SUPPORTING CHINESE PRESCHOOLERS' SOCIAL AND EMOTIONAL DEVELOPMENT THROUGH A TECHNOLOGY-INTEGRATED PROGRAM

A thesis submitted to the faculty of
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In partial fulfillment of
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In

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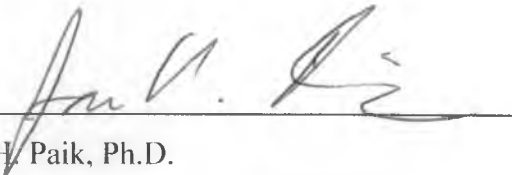
by

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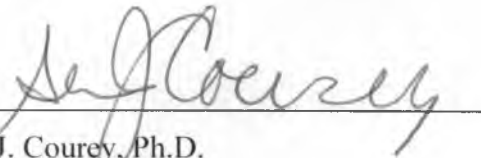
San Francisco, California

Spring 2016

CERTIFICATION OF APPROVAL

I certify that I have read Supporting Chinese Preschoolers' Social and Emotional Development through a Technology-Integrated Program by Jessica Lauren Dow, and that in my opinion this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirement for the degree Master of Arts in Psychology: Developmental at San Francisco State University.

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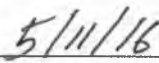Jessica Lauren Dow
San Francisco, California
2016

The purpose of this study is to examine the efficacy of using a technology-integrated Social Emotion Learning (SEL) program as a way of teaching emotion knowledge to young, Chinese children. The study consisted of 58 preschoolers in Chengdu, China who were split into experimental (n = 26) and control (n = 32) groups. Children in the experimental group received a 5-day SEL program that integrated an iPad application specifically targetting emotion recognition and understanding. Children in the control group received their regular curriculum. Children were measured on the Emotion Matching Task (EMT) before and after the iPad program. Results suggest that children in the experimental condition significantly improved more than the control condition in emotion knowledge as a result of the short SEL program. This research can be used for the develpoment and implementation of SEL programs for preschool classrooms.

Keywords: children, emotion knowledge, Social Emotion Learning, technology

I certify that the Abstract is a correct representation of the content of this thesis.

Chair, Thesis Committee   Date

PREFACE AND/OR ACKNOWLEDGEMENTS

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Importance of social and emotional skills

  In the past, early education has focused on developing general cognitive abilities (e.g., mental control and perceptual speed) and increasing proficiencies in core academic subjects (e.g., literacy and math). This is partly due to a societal emphasis on academic achievement as a means for ensuring future success in life. Until recently, teaching young children emotion knowledge and social skills in educational settings has been overlooked despite the mounting empirical evidence suggesting the important role these skills play in predicting children's cognitive abilities (Garner & Waajid, 2012; Izard et al., 2001; McClelland, Morrison, & Holmes, 2000; Mega, Ronconi, & De Beni, 2014; Nix, Bierman, Domitrovich, & 2013), as well as their general well-being (Lin & Hsiu, 2009; Mavroveli, Petrides, Rieffe, & Bakker, 2007; Salguero, Palomera, & Fernández-Berrocal, 2012;).

  The impact of emotion knowledge in early childhood years on later social adjustments and academic performance has been well documented in the literature (e.g., Garner & Waajid, 2012; Wellman, Cross, Watson, 2001). For example, in a longitudinal study, Izard and colleagues (2001) found that 5-year-olds with better emotional perception skills were more academically and socially successful even after years of formal education. Others have demonstrated that children with higher emotion awareness by the time they entered primary school showed higher prosocial behaviors and lower risk for aggression problems and anxiety disorders (e.g., Greenberg, Kusch, & Mihalic, 1998).

  In fact, research suggests that processes involved in social, emotional, and cognitive functioning are profoundly related (Case, Hayward, Lewis, & Hurst, 1988;

Garner & Waajid, 2012; Nix et al., 2013). In brain imaging studies, social and emotional functioning has been found to be linked to the neural circuitry in the prefrontal cortex—area in the brain responsible for higher-order cognitive functions such as mental control, abstract reasoning, organizing, and planning (e.g., Barrett, Mesquita, Ochsner, & Gross, 2007). Other studies have shown that social and emotional skills during early years strongly predict their academic achievement in later years (Dulewicz & Higgs, 2000; Izard et al., 2001; Schonfeld et al., 2015; Trentacosta & Izard, 2007; Wentzel & Asher, 1995). One study found that kindergartener's emotion knowledge predicted academic achievement in first grade (Trentacoasta & Izard, 2007). Another study also found that preschoolers' level of emotion knowledge was associated with higher academic achievement in first grade, and that this was strongly mediated by attention skills in kindergarten, portraying a clear example of how cognitive processes and emotion understanding are related during childhood development (Rhoades, Warren, Domitrovich, & Greenberg, 2011). Even during college years, experience of emotions continues to affect academic achievement in that the more positive emotions students report, the more motivated and self-regulated they are in their learning experience, which in turn leads to better academic performance (Mega et al., 2014). In summary, there is a general agreement among researchers and educators that cognitive, social, and emotional aspects are highly intertwined.

Social and emotional skills also have a profound impact on students' well-being and overall life satisfaction. For example, students' perceived emotional intelligence (i.e., ability to understand and use others' emotion expressions) has been found to be a strong

predictor of positive psychological adjustment (Salguero et al., 2012). Others have demonstrated the impact of students' social and emotional regulation on their mental health, happiness in life, and relationships with friends and family (Gross & Johns, 2003; Gumora & Arsenio, 2002; Juvonen & Wentzel, 1996; Matsumoto, et al., 2008; Yoo, Matsumoto, & LeRoux, 2006; Suizzo, 2000; Wentzel, Wigfield, & Miele, 2009; Zins, Bloodworth, Weissberg, & Walberg, 2004). Similarly, adolescents' (11- to 15-year-olds) emotional intelligence (self-report) was positively related to their adaptive coping mechanisms and negatively related to depressive symptoms (Mavroveli et al., 2007). Furthermore, children who are better able to get along with others and control their negative emotions (i.e., anger and distress) participate more in classroom activities and are better adjusted to school, compared with children who lacked these important social skills (Ladd, Kochenderfer, & Coleman, 1997; McClelland et al., 2000).

Social and Emotional Learning (SEL) programs

Social and Emotional Learning (SEL) is receiving much attention in recent years and is becoming an integral part of current education curriculums. SEL programs focus on the ability to understand and recognize emotions, manage social problems, and build positive relationships (Elias, 1997; Payton et al., 2000). More schools, both at the district and state-level, are adopting SEL programs as a part of their core school curriculums (Goleman, 2006; Stone-McCown, Freedman, Jensen, & Rideout, 2005). There have been several SEL programs that have been successful in teaching older children social emotional development. One example is the RULER Approach (RULER) to social and emotional learning, developed by Brackett and his colleagues (Maurer, Brackett, & Plain,

2004). RULER is a 2-year SEL program targeted to improve the quality of classroom interactions through teacher training and organized curriculum for fifth- and sixth-graders. The program focuses on the importance of emotional literacy training and provides engaging, empowering, and productive learning environments that will lead to better emotional support for the entire classroom. Furthermore, evidence suggests that classrooms using RULER display higher connectedness between teachers and students, as well as higher autonomy and leadership among children, compared to non-RULER classrooms (Rivers et al., 2013).

In another established SEL curriculum program developed by Greenberg and Kusché (1998)—Promoting Alternative Thinking Strategies (PATHS)—focuses on the development of self-control, emotional awareness, and interpersonal problem-solving skills for primary school students. In a randomized control trial of two groups (treatment vs. control) of third grade students over 3 years, PATHS was found to be effective in improving children's social skills and strategies for handling aggressive situations (i.e., increased aggressive social problem solving; Crean & Johnson, 2013). Additionally, students who were involved in PATHS curriculum showed significantly higher improvement in their academic achievement, including reading, writing, and math than students who did not participate in the program (Schonfeld et al., 2015).

Unfortunately, there is a lack of effective, evidence-based SEL programs (Linnenbrink-Garcia & Pekrun, 2011), especially for children under the age of six. Yet, preschool years may be the most critical time for developing fundamental social and emotional skills, as young children (1 ½ year-olds – preschool) are already able to

understand social roles (Watson & Fischer, 1980). Particularly, preschoolers with higher social emotional skills tend to show higher school readiness when they enter kindergarten (Nix et al., 2013). Among early social and emotion skills includes being able to define, recognize, and understand emotions (Izard et al., 2010). Furthermore, main emotion intelligence (EQ) theorists such as Salovey and Mayer identify emotion knowledge to be one of the core areas of EQ (Channel & Barth, 2013; Salovey & Mayer, 1997). Preschoolers are developing the ability to perceive and label emotions in one self and others (e.g., recognizing that mommy is becoming upset based on changes in her facial expressions and body language), make judgments about emotion-eliciting social situations (e.g., judging the emotion of a girl who has just lost her pet), and channel and control experienced emotions into socially appropriate and accepted behaviors (e.g., postponing negative emotional reactivity or delaying instant gratification for larger rewards). Such emotion knowledge also facilitates the development of more complex social and emotional skills that involve perspective-taking, empathizing with others, relationship management, social responsibility, and more.

Through modeling, role playing, and circle time discussions, early childhood educators can devote class time to providing opportunities for children to learn important emotion knowledge and skills such as ability to identify and label feelings, communicate with others about emotions, and resolve disputes with each other effectively (e.g., Giménez-Dasí, Fernández-Sánchez, & Quintanilla, 2015). However, as discussed earlier, there are limited SEL programs that are integrated into early childhood educational settings. In a recent pilot study, it was found that children as young as 2-years-old are

able to benefit from an emotion regulation, emotion knowledge, and emotional competence intervention (Giménez-Dasí et al., 2015). In this study, a 6-month long SEL program was implemented in a group of Spanish 2-year-olds while another group that did not received the SEL program served as a control condition. The curriculum included weekly 30-min teacher-directed activities that used fictional storytelling and playtime to teach identification, causality, and labeling of the four basic emotions (i.e., happiness, sadness, anger, and fear). Pre- and post-test analyses indicated that children in the SEL condition improved significantly more than the control condition in both social competence and emotion knowledge (Giménez-Dasí et al., 2015). The results support the notion that young children can benefit greatly from early SEL programs that focus on improving emotion knowledge.

Early SEL programs for Chinese children

Early SEL program may be especially important for children growing up in a culture that underplays the significance of displaying emotions (Potter, 1988; Wang, 2003). Many East Asian cultures such as Chinese, parents generally discuss less about feelings and emotions with their child, as well as discourage their child from expressing emotions as it may disrupt group harmony and question status hierarchies. Studies have shown that both Chinese children and adults have lower understanding of emotional situations than American children and adults (Wang, 2003). With an increase in mental health problems including substance abuse, violence, and suicide among Chinese youths in recent years (Sun & Shek, 2010; Kam, Wong, & Fung, 2011), Chinese educators and researchers can focus on ways to improve social and emotional skills in early years (Kam

et al., 2011; Lin & Hsiu, 2009). Although conducted with older elementary Chinese students with life-adjustment problems, a SEL program, which focused on positive emotional education, was found to provide better life-adjustment, well-being, and emotional intelligence (Lin & Hsiu, 2009). Yet in another study, Hong Kong first graders' emotion regulation, pro-social behaviors, and emotional understanding improved significantly after participating in the PATHS program for 4 months (Kam et al., 2011). Although there was no comparison control group, their study provides support for the idea that providing early SEL program may be beneficial for Chinese children.

Integrating Technology into Early SEL Program

The use of electronic devices and multi-touch tablets in early childhood education settings has expanded dramatically in recent years (Lim, 2012). In fact, the early childhood educational market has been identified as one of the fastest and largest growing areas for software companies, as young children are rapidly increasing the time spent interacting with technology (Common Sense Media, 2011). When iPads were first introduced in 2010, the development of iPad apps for early childhood education quickly followed, especially in the areas related to basic STEM (science, technology, engineering, and math) concepts (see Aronin & Floyd, 2013, for review).

A technology-enhanced learning environment contributes greatly by enhancing learners' interests and motivation (Ritchie & Hoffman, 1997; Quintana et al., 2004; Hirsh-Pasek et al., 2015). Interactive aspects of these programs allow for physical manipulation and exploration that enriches learning experience. With multi-media technology, learning materials and problems can be presented in highly individualized

collaborations among teachers, educational researchers, and curriculum developers are beneficial when designing any technology-enhanced learning program.

Present technology-integrated SEL program

The aim of this study was to investigate if a technology-integrated SEL program could be incorporated effectively into a Chinese preschool classroom to improve their emotion knowledge and awareness. A short, 5-day SEL program was introduced to a sample of Chinese 4-year-olds and the efficacy of the program was examined. In consultations with developmental and emotional psychologists, and early childhood educators from China, U.S., and Singapore, a team of Chengdu preschool teachers developed a 5-day SEL program that focused on teaching children emotion awareness and literacy. Activities focused on teaching identification of facial expressions, identification of emotions expressed in situational scenarios and understanding what provoked certain emotions, and being able to draw and match emotional expressions. An iPad application called "Emotion Project" developed by an educational software development company in Silicon Valley, CA., U.S.A., was also incorporated into their lesson plan each day (See Appendix A for a sample lesson plan). There were two main reasons for inclusion of iPad application: (1) to consistently provide appropriate and accurate emotion illustrations. A combination of 3D avatar characters, live video clips of humans, photographs, and graphic illustrations are used (see Appendix B for pictures of iPad program). All of the characters displayed FACS (Facial Action Coding System) validated expressions of the six universal emotions (happy, sad, surprise, angry, fear, and disgust). (2) to engage children and offer a playful, non-threatening learning activities

effective (Hirsh-Pasek et al., 2015). Technology is most beneficial for young children when teachers intervene and provide assistance as needed to facilitate children's learning experience (Clements & Samara, 2002; Haugland, 1999; Nir-Gal & Klein, 2004; Plowman & Stephen, 2005; Hutchison, Beschorner, & Schmidt-Crawford, 2012). Often times, young children will experience problems working with technology and teachers must provide cues and instructions promptly. Additionally, technological apps have few critical aspects that must be addressed in order to be effective (Hirsh-Pasek et al., 2015). This includes providing the opportunity for scaffolding, in which teachers or parents have the ability to help guide children to learn skills that may be too advanced for them to learn on their own (Hirsh-Pasek et al., 2015). Therefore, incorporating technology into educational settings requires careful craftsmanship; making sure these learning tools become an integral part of a system that includes children, teachers, and curricula (Blumenfeld et al., 1991; Quintana et al., 2004; Reiser, 2004).

As teachers come to play a major role in technology-enhanced learning environments, teacher trainings are also critical for success of the program. Teachers must be willing to learn new technology, and they must have the sufficient knowledge and competency to work with technology (Chen & Chang, 2006; Cuban, Kirkpatrick, & Peck, 2001; Ljung-Djärf, Åberg-Bengtsson, & Ottosson, 2005; Ljung-Djärf, 2008). Teachers need to fully understand the best methods of embedding technology that will lead to optimal learning for children and modify the instruction accordingly. Finding technology-integrated learning tools that work well for their classrooms can be productive and rewarding but can also be challenging and time consuming. In general,

where children feel comfortable learning and sharing their emotion-provoking experiences.

We hypothesized that children who receive the 5-day, technology-integrated SEL program would improve in their emotion knowledge when compared to children who did not receive such program. This is one of the first studies to examine Chinese preschoolers' emotion knowledge and the impact of an early technology-integrated SEL program on their social and emotional understanding.

Method

Participants

Participants were 66 (32 male) 4-year-olds from the Experimental Kindergarten of the Chinese Academy of Sciences in Chengdu's Wuhou District (henceforth Experimental Kindergarten). Chengdu is an island city and the capital of China's Sichuan province, located in the Southwest region. Children spoke Mandarin Chinese, which is the official language used in schools in China. Thirty-four children were randomly assigned to the experimental condition, in which they participated in a 5-day iPad-integrated SEL program. This program was held within children's regular classroom and taught by their teacher. An additional 32 children were assigned to the control condition, in which they received typical instruction from their teacher in the classroom.

Materials

Pre- and Post-Tests. Three of the four parts of the Emotion Matching Task (EMT; Izard, Haskins, Schultz, Trentacosta, & King, 2003) were used to examine children's emotion knowledge. The EMT consists of three distinct forced-choice

and contextualized manners that are often more meaningful to learners of all ages. Such a personalized learning environment can further boost learners' level of engagement and attention, thus promoting the learning process. Moreover, computing-technology offers access to timely information, such as instant correction of errors and supporting feedback to learners while tracking their learning progress (Blumenfeld et al., 1991; Hirsh-Pasek et al., 2015).

Integration of technologies in early childhood educational settings is certainly not a new concept in the field. Many educational as well as edutainment (i.e., entertaining games with an educational aspect) applications have been developed. Abundant evaluative studies have been conducted and have demonstrated the effectiveness of technology-integrated learning programs for various domains of young children's learning, including conceptual and cognitive development, literacy skills, mathematics knowledge and competence, and comprehension monitoring (Clements & Sarama, 20027; Elliott & Hall, 1997; Li & Atkins, 2004; Pange, 2003; Parette et al., 2009). These studies show that when integrated effectively in the classroom, even a small number of sessions are sufficient to produce relatively large gains. However, there is still limited experimental research examining the efficacy of technology-integrated learning programs for young children (Hirsh-Pasek et al., 2015; Kucircova, 2014), especially in the areas related to social and emotion knowledge.

It is important to note that mere presence of technology alone will not lead to positive learning outcomes. In fact, it may even have adverse effects on learning, such as technological apps that create more distraction for children and are not educationally

matching tasks including expression-expression matching, expression-situation matching, and expression-label matching. There were a total of 12-items on each part. In the expression-expressions task, children were presented with colored photographs of children making facial expressions of four basic emotions (i.e., happiness, sadness, anger, and fear/surprise), as well as facial expressions of "neutral" (no perceptual signals of emotion). Then children were given emotion labels (e.g., happy) and were asked to find the photograph that correctly represented the target labels among the four that were given. In the expression-situation matching task, children were asked to match pictures of facial expressions with situations that would have caused that emotional reaction. In the expression-labeling task, children were asked to verbally express how children feel in a given photograph based on their facial expression. In the expression-label matching task, children were asked to match expressions that were verbally instructed by the tester with the photograph of the matching facial expression.

The EMT is a dependable measure, which demonstrates both criterion and convergent validity (Morgan, Izard, & King, 2010). Furthermore, Morgan and colleagues (2010) suggested this to be a reliable test as they conducted split half reliability on a 24-item test with a strong reliability for all of the items ($\alpha = .87$). Although the original EMT was designed to represent an ethnically diverse U.S. population by including photos of children from the African American, Latino/Latina American, and Native Indian backgrounds, there were no photos of children from the East Asian background. However, four targeted emotions (i.e., happiness, sadness, anger, and fear/surprise) are universal, thus, Chinese children's ability to distinguish facial expressions of ethnically

non-represented samples in their culture should not be influenced. All testing materials were translated to Mandarin and were then back translated to English by multiple Mandarin-English speaking bilinguals.

Procedure

All children were initially given a pre-test, which consisted of tasks that examined their emotion knowledge. In the experimental group, children participated in a 5-day, iPad-integrated SEL program for approximately 30-mins per day. Children were divided into two groups of children to keep the classroom size small. Everyday, the lead teachers taught the emotion lesson plans utilizing the iPad application. Teachers spent roughly 20-mins on instruction during the group lesson time, followed by 10-mins of small group activities. During the group lesson time, teachers gathered children in a circle and used the projectors to integrate the iPad application. In small group activities, 3 - 4 children worked together using the iPad application. The rest of the children received a typical instruction in their normal classroom, thus serving as the control group. Typical classroom instruction included small group activities and circle time, but instruction did not focus on lessons of social and emotional development. Upon the completion of the 5-day SEL program, all children were given a post-test that was identical to the pre-test.

Performance scores on the EMT were compared between the experimental and the control groups for pre- and post-tests.

Results

Because we were interested in examining the gains in emotion knowledge as the results of the technology-integrated SEL program, children who performed at chance or

below the chance performance (with a score of lower than 9) on the pre-test were included in the analyses. Six children were removed because they performed significantly better than the chance score. Thus, we report results from the 28 children in the experimental group and 32 children in the control group. To ensure that there were no significant differences between the experimental and control group prior to the intervention, an independent samples t-test was conducted and showed that the control ($M = 17.14$, $SD = 4.48$) and experimental groups ($M = 18.80$, $SD = 3.29$) performed about the same on the pre-test EMT, $t(58) = 1.57$, $p = .121$, $d = .42$.

A 2 (Test Session: pre- and post-test EMT score; within subjects) by 2 (Condition: experimental vs. control condition; between subjects) repeated measures ANOVA was conducted and results suggest a significant main effect of Test Session, $F(1, 56) = 36.76$, $p < .001$, $\eta^2 = .396$, which reflected children's general improvement of their performance on post-test ($M = 21.01$, $SD = 5.15$) than on pre-test ($M = 17.89$, $SD = 4.05$). The ANOVA also revealed a significant main effect of Condition, $F(1, 56) = 9.87$, $p = .003$, $\eta^2 = .150$. Overall, children in the Experimental condition performed better ($M = 23.58$, $SD = 4.38$) on the post-test than in the Control condition ($M = 18.92$, $SD = 4.83$; refer to Figure 1). More importantly, there was a significant interaction, $F(1, 56) = 7.69$, $p = .008$, $\eta^2 = .121$. Post-hoc analyses (Tukey HSD), suggest that indeed, children in the Experimental condition performed significantly higher on the post-test ($M = 23.58$; $SD = 4.38$) than on the pre-test ($M = 18.80$, $SD = 3.29$), $t(27) = 6.11$, $p = <.001$, $d = 1.23$. However, children in the control condition also performed slightly higher on the post-test ($M = 18.92$, $SD = 4.83$) than on the pre-test ($M = 17.14$, $SD = 4.48$), $t(31) = 2.49$, $p =$

.015, $d = 0.38$). This difference is to be expected for young children, as they are constantly learning and improving in emotion knowledge at this age. Furthermore, the effect size was small to medium, indicating relatively small difference. A further t-test was conducted and suggested that improved scores from the pre- to post-test were significantly higher for the experimental group than the control group, $t(56) = 2.77$, $p = .008$, $d = 1.01$ (again, refer to Figure 1). Additional analyses were conducted to examine if there were any gender differences, however there were not for pre- or post-tests among the experimental or control group.

Discussion

The hypothesis that Chinese children who experience a 5-day, technology-integrated SEL program will improve in emotion knowledge was supported. It is important to note that the program was short (only 30-mins per day for 5-days), yet improvements were still made in emotion knowledge. Although the increase in their performance on the EMT was rather small it was most likely due to the short length of the SEL program. Further, the increase was significant and the effect size was large, suggesting that this program is a sufficient tool to teach emotion knowledge in young children. This study only focused on the emotion knowledge aspect of SEL because it was a short program, and teaching other areas would require a longer program. Future studies could investigate the use of this program to also teach other aspects of SEL such as theory of mind, emotion regulation, and peer-to-peer social skills. Experimental research on early SEL programs is limited, however with the growth need for social emotional development among preschoolers, it is important to continue to examine the

efficacy of these types of programs as a way to foster SEL in young children.

Children's improvement in emotion knowledge at such a young age is especially important because it may impact future success in academia (Garner & Waajid, 2012; Wellman et al., 2001), as well as psychological well-being (Salguero et al., 2012). Providing a base understanding of recognizing facial expressions, general emotion knowledge (Salovey & Mayer, 1995), and ability to recognize other's and one self's emotions is one of the first aspects of emotion intelligence, and may give the skills needed to foster peer and teacher relationships for students (Izard et al., 2001). It is especially important to note that it may be the most imperative time to teach children these skills. Young children are learning rapidly at this age, yet they are just beginning to solidify their abilities to interact socially. If these social and emotional skills are developed early, than they may be transferred on as children enter kindergarten and elementary years (Mize & Ladd, 1990). Indeed, SEL programs have become much more recognized and included in school curriculums, and research has found these programs to be effective for children and adolescents, and have lasting effects (Izard et al., 2001). However, there is a lack of evidence based SEL programs for young children, especially preschoolers. This study provides support that teaching preschoolers SEL can be an effective way to teach young children, specifically in the area of emotion knowledge.

Results of the current study show that early SEL programs may be especially beneficial for children growing up in a culture that discourages the expression of emotions. East Asian cultures, specifically Chinese, underplay the significance of expressing and discussing emotions of self and others. Furthermore, there is a lack of

social emotional development curriculum in Chinese classrooms, and there may be negative implications, such as Chinese children have been found to perform lower in emotion knowledge tasks than their American counterparts (Wang, 2003). Furthermore, in general, the children in the current study performed fairly low on the pre-test EMT, which is consistent with previous literature that Chinese children have lower understanding and expression of emotion knowledge. However, Chinese educators are now recognizing that focus of education needs to not only be on academic achievement but also on the student's all-around development, which has led to increased recognition and desire for implementation of SEL programs and research on SEL programs has begun to be conducted in East Asia (Kam et al., 2011). It is essential that educators and curriculum developers be involved in designing SEL programs, so that they are culturally appropriate. The SEL program utilized in this study was designed in conjunction with teachers in Chengdu, China, ensuring that the program fit the needs of their classrooms, rather than implementing concepts that have only been accepted by teachers in the United States. Although this study did not address a direct cultural comparison, future studies can examine if Chinese children benefit more than their American counterparts from a SEL program.

The present study addresses the gap in the literature concerning the experimental examination of the use of technological tools as an effective way to teach children, specifically in this case social emotion knowledge. In the current SEL program, the iPad application was used to provide an accurate and consistent depiction of emotions. It was important to provide illustrations that were approved by FACS (Facial Action Coding

System), which ensured that children learn the specific facial features for each targeted expression. Our results echo past studies that have also shown that technology-integrated programs can be especially beneficial for children as these programs are highly engaging for young children (Hirsh-Pasek et al., 2015). Further, our results suggest that integrating technology into SEL programs can be an effective way to teach children emotion knowledge, as seen by children's improvement in the EMT measure compared to the control group. Furthermore, educators may doubt the incorporation of technology as a way to teach SEL in the classroom, but it has proved to be an effective tool in this case. Overall, the study was accepted by teachers and children, and suggests that future use of a similar SEL program within the classroom would be successful. Children were excited to participate in activities, and teachers felt that the program was a useful way to teach social emotion development to their young students (see Appendix C for one teacher's reflection of the SEL program).

However, this study did not investigate if the use of technological programs is more effective than implementing programs that do not integrate technology. The study lacked a better control group to examine how effective a technology-integrated program is compared to non-technology-integrated SEL program. Alternative to the aim of the current study, future studies can also investigate if an iPad SEL program could be used effectively for a child to use independently. Although teacher facilitation is important for young children, it could be beneficial if children are given opportunity to work independently (Alves, Marques, Queirós, & Orvalho, 2013). Future applications can also individualize programs, so that children are able to learn at their own pace.

Another area in which SEL programs can be integrated is for children that are low functioning in social skills or children with special needs. Children with Autism Spectrum Disorder (ASD) have an affinity for using computers, and may actually learn better with interactive and visual activities. Therefore, there has been a significant increase in technology-based activities to teach children with ASD various skills (Alves et al., 2013). Ploog, Scharf, Nelson, & Brooks (2013) reviewed the literature on Computer-Assisted Technologies (CAT) that are used to teach children with Autism Spectrum Disorder (ASD), and in regards to emotion recognition, they found that studies implementing CAT emotion learning programs have found significant improvement for children in facial emotions recognition. However, there is still a lack of empirical evidence in comparing these experimental groups to non-CAT using control groups. Therefore, using CAT interventions are not necessarily more successful than other more traditional interventions. However, as mentioned, CAT interventions provide particular motivation for children with ASD, so these interventions may still be favored for training activities.

Socio-emotional development is important for children's future success in life in areas of academia, social relationships, and even in the workplace. An interactive SEL program, such as the one in this study is a promising tool that may be used for diverse groups of children, even in a culture that is just beginning to value emotion understanding. Teachers can focus on early intervention and social emotional development in the classroom in early years by implementing SEL programs. Programs that integrate technology may be especially ideal to include in the classroom, as they are

consistent and teachers may not have to design an entirely new curriculum to teach SEL. The current study provides evidence that young children can improve in emotion knowledge from a technology-integrated SEL program, and that teachers can take advantage of this time to teach students to foster learning in this important area of development.
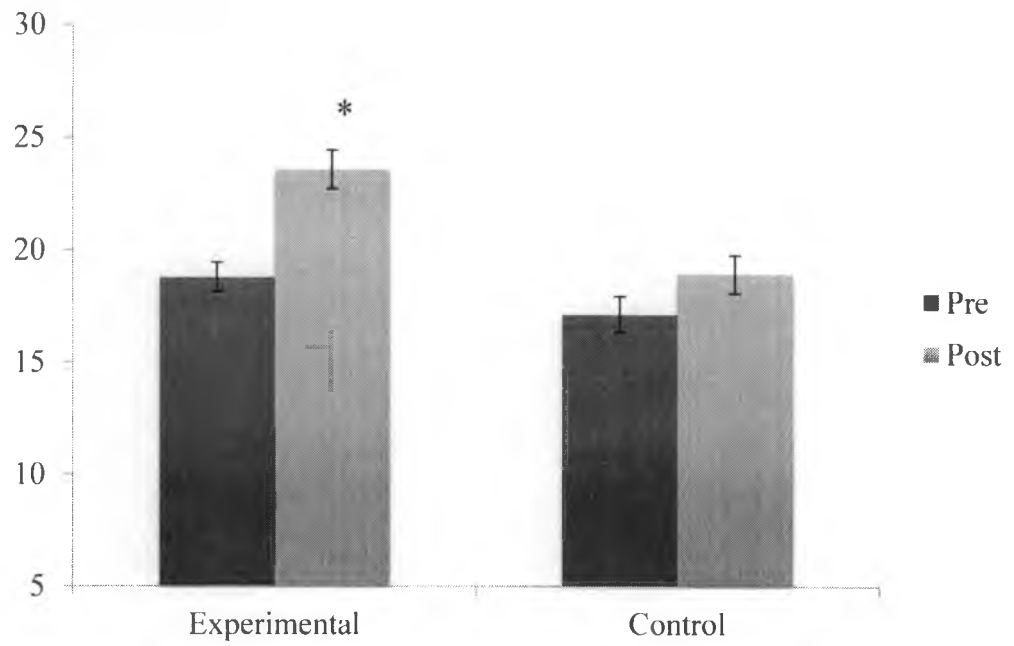
Figure 1. Mean percentage correct on pre- and post-test scores on EMT for experimental and control groups.

Appendix A

Sample Lesson Plan

Building on from the previous lesson plans and activities:

Continuation of iPad-integrated activities from previous days where children learned about different facial features associated with 6 basic emotions (e.g., happy, sad, angry, surprise, fear and disgust). Using avatars on the iPad application, children also compared and discussed different emotions. Further, they learned to draw and express emotions using one of the iPad drawing activities.

Present Activity Objectives:

1) Review basic features associated with each emotion.
2) Recognize and label emotions/feelings. Build emotion literacy by providing alternative words to describe basic emotions.
3) Cultivate children's expressive language abilities by asking children to describe situations that trigger certain emotions.
4) Discuss body languages that are linked to each emotion.
5) Practice expressing emotions (both facial expressions and body languages).

Materials:

1) An iPad connected to a projector in the classroom
2) Extra iPads for small group activities
3) For teacher: Teacher's Handouts from the training program (e.g., #2. Facial features and body languages associated with basic emotions, #4., Emotion words, #5., Sample scenarios)
4) For children: a small hand mirror

Procedure:

1) *Review*: Open up the iPad application Emotion Awareness Activity 1. Basic Emotions. Go through the six basic emotions using the avatars. Ask children to identify facial features that they have gone through in previous days. For each emotion, ask children to think of an alternative ways of describing each emotion that the avatar is expressing. Use Teacher's Handouts to help guide children's answer. Provide feedbacks.
2) *New Activity*: Open up the iPad application Emotional Awareness Activity 2. Your Emotion. Choose one of the emotions (e.g., happy).
   a. First, ask children which emotion the avatars are showing on the screen. Ask children to think of the reasons behind why avatars may be expressing certain emotion. Encourage children to stand up and share

their thoughts and guide their discussions with entire class. Use Teacher's Handouts to help provide alternative examples.

b. In the beginning, the situation should be addressed in 3rd person perspectives (what other's are feeling). Then, ask children to share situations where they felt such emotion, how it made them feel and what they did. Ask other children if they also feel the same in similar situations. Notice alternative words children may use while telling their stories and encourage children to think of other words to describe their feelings. Use Teacher's Handouts for guidance.

c. Open up the red curtain on the iPad application Emotion Awareness Activity 2. Your Emotion. This will activate the video camera function on the screen on the right along with avatars presented on the left. Have a child come up and ask the child to express the same emotion as avatars are showing. Once the child is ready, take the photo using the iPad application. Ask the child what they were thinking about or when they feel that particular emotion. Children highly enjoy this activity and many are willing to share their stories and take emotion photos. Therefore, compare children's photos and discuss children's answers during this activity.

3) *Extension Activity 1*: Children should have a small mirror for this activity. Have them look at their faces in the mirror and given them a situation that would elicit certain emotion (Use Teacher's Handout as a guide). Have them practice making facial emotions associated with the given scenario. Have children pair up and check each other's emotions.

4) *Extension Activity 2*: As we have learned during teacher-training, various body languages and behaviors are associated with each emotions. Prior to the class, using the same iPad application activity, teachers can take photos of themselves making facial emotions with accompanying body languages (or use the photos of the children that have naturally produced certain behaviors associated with each emotion), display the photo on the screen and ask children describe the body languages for emotions. Use Teacher's Handout for guidance.

5) *Small Group Activity*: Break a class into small groups of 2-5 children/iPad. Have them take turns taking photos of each other making emotions and further discuss situations that elicit certain emotions. Have each group pick their favorite photo and scenario and come up to share it with entire classroom.

Appendix B

"Emotion Project" – Sample Activities

Appendix C

Teacher Reflection

One of Chinese Teachers' reflections after giving this lesson plan:

It was my pleasure to be involved with teaching emotional skills to my students. Through this iPad program, not only did my students learned about emotion awareness, I also learned a lot about how to recognize and be more aware of my students' emotions. More importantly, I learned that my students are also paying close attention to my emotions. Few days after the program was completed, I was having a stressful day and couple of my students came up and asked if I was having a bad day and if I was okay. They mentioned that I showed in my face and in my body how I was feeling.

The procedure of the lesson plan was clear after the teacher-training program and I was able to incorporate my own examples (e.g., emotion eliciting scenarios more culturally appropriate for Chinese children) and activities not provided in the program. I believe under teacher's guidance, students are able to actively participate and learn a lot from this iPad-integrated program. During the activities, I realized that exaggerating my expressions could liven up the class, which made it more fun for them. I believe my students were quiet surprised to see me getting involved in this type of learning with them.

During the small group activity, my assistant (referring to the teacher's helper) decided to add a story that was not discussed before. However, because it was a sudden addition, the assistant did not do a good job of capturing how the story was associated with the emotion being discussed (we have learned through participating in this program that fear and disgust is definitely more challenging for our students to understand). Next time, we need to be more prepared before class starts for these challenging emotions.

At a glance, lesson plan to teach emotion awareness seemed simple and natural. However, I realized that integrating it into the classroom could be quite challenging. In order to keep the activity fresh, exciting and easy to understand, the teacher must plan meticulously. I think having the iPads definitely helped children be more excited and willing to sharing their thoughts, feelings and ideas. I have also realized that my students' ability to use varying emotion words were difficult. Teachers need to focus on teaching children how to use alternative words for expressing emotions.

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