
Title	Which mediates achievement: Social emotional competencies or motivational orientations?
Author(s)	Jessie Ee, Soh Kay Cheng and Mingming Zhou
Source	<i>AARE - APERA Joint Conference, Sydney, Australia, 2-6 December 2012</i>

This document may be used for private study or research purpose only. This document or any part of it may not be duplicated and/or distributed without permission of the copyright owner.

The Singapore Copyright Act applies to the use of this document.

Which Mediates Achievement: Social Emotional Competencies or Motivational Orientations?

Jessie Ee, Soh Kay Cheng & Mingming Zhou

National Institute of Education, Nanyang Technological University, Singapore

Abstract

The development of students' social emotional competence (SEC) has recently received increasing attention because SEC is believed to positively influence motivation and learning outcomes. Grade Fourth students from two primary schools in Singapore ($N=240$) were surveyed on five SECs (self-awareness, social awareness, self-management, relationship management and responsible decision making) for their social-emotional maturity and three goal orientation variables (effort, ego, and work avoidance) for their motivation orientations. Students' achievement scores for three core subjects (English Language, Mathematics, and Science) were provided by the schools. At a conceptually more general level, factor scores were generated for Social Emotional Maturity, Motivational Orientation, and Achievement, by way of a series of three factor analyses. The three factor scores were then used to ascertain the mediation effects of Social Emotional Maturity and Motivational Orientations when predicting Achievement. By comparison, Motivational Orientation has a greater probability of being a mediating variable. The implication for predicting students' achievement from their social emotional competence and the development of their motivational goals are discussed.

Keywords: Social emotional learning; social emotional competence; primary education; social emotional maturity, motivational orientations, achievement.

Author Note

This research was supported by the Centre for Research in Pedagogy and Practice under a Singapore Ministry of Education research grant. Any opinions, findings, and conclusions expressed in this article are those of the authors and do not reflect the views of the Centre or the Ministry. Correspondence should be directed to A/P Jessie Ee, Psychological Studies Academic Group, National Institute of Education, Nanyang Technological University, 1 Nanyang Walk, Singapore 637616 or via email to jessie.ee@nie.edu.sg, phone: (65) 6790 3223, fax: (65) 6790 9330

Social emotional learning (SEL) has become an increasingly popular element in basic education. SEL is a process through which students' social emotional competence (SEC) is developed. SEC comprises a range of abilities that are believed to enable learners to self-monitor their behaviors and self-regulate their learning (Wilson, Gottfredson, & Najaka, 2001; Zins, Weissberg, Wang, & Walberg, 2004). Several reviews have also demonstrated that students with desirable SECs are better motivated in schoolwork and enhance better achievement in tests and exams (e.g., Dymnicki, 2006; Taylor, 2006).

Social Emotional Competence

SEC has been defined as the possession of a range of abilities to recognize and manage emotions, develop caring and concern for others, solve problems effectively, establish positive relationships with others, make responsible decisions, and handle challenging situations effectively (CASEL, 2006; Elias, Zins, Graczyk, & Weissberg, 2003; Zins & Elias, 2006). When it comes to academic settings such as classrooms and schools, the focus is more on one's ability to manage the self and interactions with peers. However, this focus still involves a range of manifested behaviors such as control of emotions, care about peers, effective communication with peers, engagement in group work, and maintaining a healthy relationship with others. Some researchers argue that these social and emotional skills and behaviors are among the most influential factors on student learning (e.g., Wang, Haertel, & Wallberg, 1997). Some emotions may hamper learning (e.g., sadness and anger) while other emotions and feelings may promote learning (e.g., a sense of wellbeing or a feeling of being safe and valued). An individual is unlikely to think clearly when dominated by powerful negative emotions (Weissberg & Elias, 1993). Thus, the individual requires social-emotional maturity, that is, to be consciously always aware of his/her strengths, understanding the various perspectives in a given situation and being able to manage his/her emotions so that better learning can take place with peers in group work. As a result, a wide range of educational gains will be obtained, including improved attendance, increased motivation, as well as higher morale and academic success (Durlak & Wells, 1997; Zins et al., 2004).

Nevertheless, the research to date has not been quite successful in fully defining social emotional competence, probably due to its complexity and the lack of clarity in the development and functioning of SEC (Zsolnai, 2002). Considering the range of attributes and behaviors described in the literature, we may distinguish the five components of SEC as explicated below.

Self-Awareness. Self-awareness includes skills in recognizing and identifying one's own feelings, strengths and positive qualities in the self (Beland, 2007; Zins & Elias, 2006). Self-awareness of one's own thoughts and feelings is an important first step in sharing personal experience with others. Students who are self-aware are able to reflect upon their strengths and current task demands and recognize their own state of being, and be clear about the reasons for their emotional responses. Students' recognition and understanding of what trigger their feelings and emotions will assist them to manage and modulate their emotional state and response rationally and appropriately (Liff, 2003).

Social Awareness. According to Eisenberg (1986), if students have greater social awareness of the emotional state of another person, they are more likely to relate better with them. It is this ability to understand another person's perspective and being sensitive to interpreting their thoughts and feelings that lead to harmonious functioning between individuals. Research has shown that empathetic children tend to show greater attention focus, perceptual sensitivity, and inhibitory control (Miller & Jansen op de Haar, 1997). They tend to exhibit more

altruistic (Strayer & Schroeder, 1989) and pro-social classroom behaviors (Litvack-Miller, McDougall, & Romney, 1997), and less aggression (Miller & Eisenberg, 1988).

Self-Management. Students experience rich and intense emotions in academic settings. As they self-manage their learning, they may be influenced by their cognitive processes, self-regulation, scholastic achievement, as well as their psychological and physical health (Pekrun, Goetz, Titz, & Perry, 2002; Pekrun & Hofmann, 1999; Titz, 2001). Students may experience negative emotions (e.g., anger, sadness, anxiety) when they engage in academic tasks that is not within their control. As they develop skills in interpreting their own emotional experiences within an ongoing social emotional situation, they gradually become more able to keep their tempers, or hold back tears, when necessary (Maccoby, 1983; Kopp, 1989), and reach an emotional state that they perceive as most appropriate in that context. Maintaining positive emotions provides the additional advantage of directing attention toward the learning task. In contrast, negative deactivating emotions (e.g., boredom, hopelessness) are generally detrimental because they erode motivation, direct attention away from the task and make any processing of task-related information shallow and superficial (Pekrun et al., 2002). Thus, in academic environments, students who cannot control their emotions are unlikely to think clearly and perform well (Weissberg & Elias, 1993). Self-management of one's emotions is therefore a significant factor for academic success (Greenhalgh, 1994).

Relationship Management. It is crucial that children learn to initiate and maintain healthy and rewarding relationships and manage the relationships effectively via communicating compromise and tact and negotiating solutions to any conflict (Asher, Renshaw, & Hymel, 1982). Children who lack on-going peer involvement and development of relationship management skills may miss opportunities to build a sense of social self-confidence that is important for their lifelong social wellbeing. They may develop little faith in their own ability to achieve interpersonal goals and may have problems in social and professional adjustments in later adulthood. Students who can use relationship management skills to overcome barriers can perform better and learn more (Zins, Bloodworth, Weissberg, & Walberg, 2004). Hence relationship management is a crucial component of SEC that may affect an individual's lifelong potential.

Responsible Decision Making. This refers to the ability to make decisions based on an accurate evaluation of any situational factor that may affect oneself or others (CASEL, 2003). Making a good decision involves high quality information-processing skills (Ormond et al, 1991) and these are closely related to metacognition, which can be defined as thinking about thinking (Flavell, 1979; 1987; Ormond et al, 1991). According to Ormond et al (1991), there are significant correlations between metacognition, self-reported decision making style and performance on a decision making task. However, ability alone is insufficient as young people may abuse it to their own advantage (CASEL, 2003). Responsible decision making also requires training in decision making that emphasizes the building of a sense of social responsibility towards others (CASEL, 2003).

In this paper, *Social-Emotional Maturity* (SEM) will be a composite of the above five SEC, namely Self-Awareness, Social Awareness, Self-Management, Relationship Management and Responsible Decision Making.

Motivation Orientation

In the present study, we examined the relationships of SEC variables to student motivation variables. Researchers have developed a number of motivational constructs that may

effectively explain students' learning. These constructs were developed on the basis of a range of motivation theories (e.g., self-determination theory, self-efficacy theory, achievement goal theory, task value theory). But in general, we may summarize them into two types of motivation: adaptive and maladaptive (Martin, 2009). In the present study, we focused on two adaptive and one maladaptive motivation constructs described in the achievement goal theory literature.

Effort Goals. Individuals with effort goals learn or master the task for its own sake (McInerney & Ali, 2006; McInerney, Yeung, & McInerney, 2001; Nicholls, 1984). They demonstrate competence through personal improvement and/or mastery of a task. In this state of task involvement, students are not concerned with how they perform relative to others at the same task but their personal improvement and, when they work hard and improve, they anticipate positive affects (Jagacinski & Nicholls, 1984). Students adopt an effort orientation when they are intrinsically interested in the activity (Butler, 1992, 1993; McInerney & Ali, 2006). Thus, success is internally referenced according to personal improvement rather than being defined in reference to others.

Ego goals. In contrast to an orientation to mastery self-improvement, students may adopt a goal that focuses on ego involvement (Nicholls, 1984). When individuals are ego-involved they are more concerned with demonstrating their superior competence to others through various means of social comparison. Consequently, when goals are ego-involved, the only way for an individual to feel successful is by outperforming others. In essence, students with a strong ego orientation are more interested in normative performance information in ego-involving conditions than in task-involving conditions (Butler, 1992, 1993). In this goal state, students may also be interested in mastering the activity, but as a means to an end of demonstrating superior competence. As working hard to achieve success is not sufficient to demonstrate competence, instead of investing maximal effort, a more favored approach to such students is to exert the least effort to achieve a level of performance that out-perform their peers (Jagacinski & Strickland, 2000).

Work avoidance goals. Work avoidance goals refer to students' tendency to give up when the work is difficult or boring. Recent studies on student motivation in school settings have attempted to distinguish between adaptive and maladaptive motivational constructs (Martin, 2009). Whereas students' effort is known to be adaptive and facilitative of academic performance, their ego goal orientation may also be adaptive and facilitative, although with a different personal purpose (McInerney & Ali, 2006). In contrast, work avoidance is maladaptive and tends to hamper learning processes and products. Lau, Liem, and Nie (2008) and Ee (1998) found that this maladaptive motivation factor was an important one that was able to detect students' lack of motivation with their samples in Singapore schools. As the present study also used a sample in Singapore, this construct was included in the study.

In this paper, the Motivation Orientation (MO) is a composite of the above three goals, with a positive valence of Effort goals and Ego goals, but a negative valence of Work Avoidance goals. The adaptive motivational goal will have higher score on Effort Goal and lower score for Ego and Work Avoidance Goals.

Objective

In this study, primary students' social emotional maturity (SEM: self-awareness, social awareness, self-management, relationship management, and responsible decision-making), motivation orientation (MO: effort goal, ego goal, and work avoidance goal) and

achievement (English, Maths, Science) were obtained to examine the relationships among these three sets of variables. According to the literature reviewed above, we expected that the SEM would be positively correlated with the motivational goal and achievement. However, SEM would be positively related to achievement in general but the strength of associations would be different depending on the motivation orientation for the different subject domains. In other words, motivation orientation is conceived as a mediating variable strengthening the relationship between social emotional maturity and achievement. The findings would provide valuable information for designers of SEC interventions, teachers and counselors implementing SEL in different curriculum areas.

Method

Participants

Students from two schools in Singapore participated in this study (N = 240). They were from Fourth Grade with 123 boys (51.3%) and 117 girls (48.8%). The participants included students from the nation's ethnic groups and speakers of the major ethnic languages. The students' ethnic distribution was Chinese (79.6%), Malay (11.3%), Indian (6.3%), and others (2.9%). This distribution is very close to that in the national population.

Procedure

The survey was administered in intact classes by the class teachers. The students responded to the survey items on a 6-point scale (1 "strongly disagree" to 6 "strongly agree"). Ethics procedures of the university were followed before data collection. The students were asked to rate on the five SEC factors: self-awareness, social awareness, self-management, relationship management, and responsible decision making; and three motivation factors: effort goal, ego goal, and work avoidance goal. Background variables included age, gender, ethnicity, and language background.

Measures

For the SEC factors, there were a total of 16 items with four items in each factor (see Appendix). Each factor is described briefly below.

Social Emotional Maturity. This was measured in terms of the following five competencies:

Self-awareness. The ability to be aware of one's own mood and to be conscious of our thoughts and action. An example item is: "*I know what I am thinking and doing*".

Social Awareness. The ability to understand how other people feel, what people think when they are sad or happy, and why people react in a certain way. An example item is: "*I understand why people react the way they do.*"

Self-Management. The ability to control one's emotion is measured by the extent to which students can stay calm in changing situations and when things went wrong. An example item is: "*I can stay calm in stressful situations*".

Relationship Management. The extent to which one could see other people's point of view and acted in an appropriate way so as to maintain a good relation with their peers. An example item is: "*I apologize when I hurt someone else unintentionally*".

Responsible Decision Making. The ability to make decisions based on an accurate evaluation of any situational factor that may affect oneself or others. An example item is: "*When*

making decisions, I take into account the consequences of my actions”.

Motivation Orientation. This was measured in terms of the following three types of goals:

Effort Goals. Four items taken from the Inventory of School Motivation (ISM) instrument were used (McInerney & Ali, 2006; McInerney, Yeung, & McInerney, 2001). The effort orientation scale examined the extent to which students were willing to work hard in schoolwork. McInerney and Ali (2006) conceptualize it as part of mastery goal (also conventionally referred to as intrinsic motivation). An example item is: *“I am always trying to do better in my schoolwork”.*

Ego Goals. The ego goal scale assessed students’ tendency on displaying their competencies and outperforming others (Nicholls, Patashnick, & Nolen, 1985). Three items were used. An example item is: *“I want to get higher marks than other pupils”.*

Work Avoidance Goals. The work avoidance scale assessed students’ tendency to hold back or minimize effort in their schoolwork. The four items were adapted from the work-avoidant scale from Meece, Blumenfeld, and Hoyle (1988) and Nicholls, Patashnick, and Nolen (1985). An example item is: *“I hope I can get away with not doing homework”.*

Achievement. There were three achievement measures of English Language, Mathematics and Science. The scores were obtained in the first term from the schools.

Results

Preliminary Analyses

Table 1 shows correlations among the five SEC variables. As shown therein, all correlations are statistically significant, though mostly moderate in magnitude, varying from a low 0.326 to a moderate 0.543, with a median of 0.440.

Table 1. Correlations among Social Emotional Competencies

	SA	SocA	RM	RD	SM
SA Self Awareness	1.00	.445	.377	.543	.382
SocA Social Awareness		1.00	.326	.515	.420
RM Relationship Management			1.00	.435	.432
RD Responsible Decision Making				1.00	.486
SM Self-Management					1.00

Note: All coefficients are statistically significant (df=238, p<0.01)

To generate a more general measure of Social-Emotional Maturity, the five measures above were submitted for a factor analysis (principal component analysis). This resulted in one factor explaining 54.83% of total variance (Table 2). Factor scores were generated for subsequent analysis.

Table 2. Factor Structure of Social Emotional Maturity

	Social Emotional Maturity
Self Awareness	.739
Social Awareness	.731
Relationship Management	.689
Responsible Decision Making	.819
Self-Management	.719
Total variance explained	54.83%

The correlations among these three MO variables are shown in Table 3. As shown therein, the correlations are low, though statistically significant with one exception. As would be expected, the correlations with Work Avoidance Goal are negative.

Table 3. Correlations among Motivational Orientation

	Effort Goal	Effort Goal	Work Avoidance Goal
Effort Goal	1.00	.372	-.291
Ego Goal		1.00	(-.014)
Work Avoidance Goal			1.00

Note: All coefficients are statistically significant ($df=238$, $p<.001$), except the one in parentheses.

To generate a more general measure of Motivational Orientation, the three measures were subjected to a factor analysis, resulting in one factor explaining 50.33% of total variance (Table 4). Factor scores were generated for subsequent analysis.

Table 4. Factor Structure of Motivational Goal

	Motivational Goal
Effort Goal	.849
Ego Goal	.692
Work Avoidance Goal	-.557
Total variance explained	50.33%

As shown in Table 5, as expected, the correlations among the subject scores were higher, varying from 0.767 to 0.891.

Table 5. Correlations among Achievements

	English Language	Mathematics	Science
English Language	1.00	.767	.891
Mathematics	.973	1.00	.835
Science	.919	.920	1.00

Notes: (1) Coefficients above the principal diagonal are for School 1 ($N=118$) and those below for School 2 ($N=122$). (2) All coefficients are statistically significant ($p<.001$).

To generate a general measure of achievement, the three measures were submitted for a factor analysis. As the two schools administered their own versions of achievement tests which were constructed with reference to the common syllabuses, specimen papers, and their respective textbooks, factor analysis was run for the schools separately.

As shown in Table 6, the factor loadings are quite sizeable for both schools and the factors explained 88.75% for School 1 and 93.60% for School 2. Factor scores were generated for subsequently analysis.

Table 6. Factor Structure of Achievement

	Achievement (School 1)	Achievement (School 2)
English	.941	.962
Mathematics	.919	.962
Science	.966	.978
Total variance explained	88.75%	93.60%

Mediating Effect

To find out whether Social Emotional Maturity or Motivation Orientation is the mediating variable in the prediction of Achievement, two models were put up for evaluation by giving them different variable status in turn. The mediating effect was tested by the Sobel Test which evaluated the probability of the indirect path, that is, the product $\alpha\beta$, where α is the correlation between the exogenous variable and the presumed moderating variable whereas β is the standardized regression coefficient between the presumed moderating variable and the criterion (Wuensch, 2009). The calculation tool (Preacher & Leonardelli, 2010-2011) yielded test statistics and probabilities for the Sobel Test, the Arioan Test, and the Goodman Test. The conceptualization of the two latter tests differ somewhat from that of the Sobel Test. However, the three tests statistics vary only slightly in magnitude and will lead mostly to the same conclusion.

In Model 1 (Table 7), Social Emotional Maturity was treated as an exogenous variable and Motivational Goal a mediating variable, with Achievement as the criterion. The Sobel Test Preacher & Leonardelli (2010-2011) was run to evaluate the effect of Motivational Goal as a potential mediator variable. For Model 1, the resultant test statistics of 2.681 for the Sobel Test is statistically significant ($p < 0.007$). This indicates that Motivation Orientation is a potential mediator variable when predicting Achievement from Social Emotional Maturity.

Table 7. Testing Model 1

Path	Predictor-Predicted variables	Standardized coefficients	t-value	p-value
Direct	SEM > ACH	.166	2.194	.029
Indirect	SEM > GOAL	(α) 0.573	10.837	.001
	GOAL > ACH	(β) 0.209	2.767	.006

Note: SEM=Social Emotional Maturity; ACH=Achievement; GOAL=Motivational Orientation

In Model 2, Motivation Orientation was treated as an exogenous variable and Social Emotional Maturity a mediating variable, with Achievement as the criterion. In other words, the two predictor variables swapped their sequence in prediction. Again, the Sobel Test was run to evaluate the mediation effect of Social Emotional Maturity. As shown in Table 8, the resultant test statistics of 2.681 is statistically significant ($p < 0.007$) indicating that Motivation Orientation is a mediator variable with very low probability of chance occurrence. For Model 2, the Sobel Test statistic is 2.150 ($p < 0.032$), indicating that Social Emotional maturity is a potential mediator variable when predicting Achievement from Motivation Orientation.

Table 8. Testing Model 2

Path	Predictor-Predicted variables	Standardized coefficients	t-value	p-value
Direct	GOAL > ACH	.209	2.767	.006
Indirect	GOAL > SEM	(α) .573	10.837	.001
	SEM > ACH	(β) .166	2.194	.029

Note: GOAL=Motivational Orientation; ACH=Achievement; SEM=Social Emotional Maturity.

Conceptually, both models are acceptable although the mediator variables are different. However, in considering the two Sobel Test results, Model 1 has a much lower probability of chance occurrence, it is reasonable to give it a priority of acceptance and consider Motivation Orientation as a mediator when predicting Achievement with Social Emotional Maturity.

Discussion

According to Wang, et al. (1997), social emotional maturity (SEM) is important for students' engagement, performance, and well-being. Given the functional and practical relevance of social emotions, the complex relationships between these emotions, motivational and learning processes and outcomes need to be studied more extensively. However, solid empirical evidence linking SEM with motivation and achievement is rare. In the present research, we attempted to fill this gap in the literature. We articulated a model explicating the relationships between SEM, motivation, and academic achievement by examining the relationships among these constructs. The important finding was that motivation orientations seemed to be a more important mediator of children's SEM and achievement.

Dymnicki (2006) and Taylor (2006) substantiated that students with desirable SECs are more motivated to achieve better achievement in their exams. Zins et al. (2004) further elaborated students who are aware of their thinking processes as they learn, the more they can control their goals, dispositions, and behaviour. Basically, Zins et al. (2004) stressed that metacognition is a good mediator for enhancing SEM. According to Marzano et al., (1988), as metacognition is thinking about thinking, the more students are aware of how committed (or uncommitted) they are to reaching their goals, of how strong (or weak) is their disposition to persist, and of how focused (or distracted) is their attention to a task, they can regulate their commitment, dispositions, and behaviour and be self-regulated. Thus, the findings in this paper may assist our understanding why the motivational orientation of the student is likely to be a more acceptable mediating variable predicting achievement. This is because when students are more goal-oriented, that is, they have identified their goals and are more purpose-driven, they are likely to be more motivated to ensure task mastery and achievement whereas, students who are low in SEM may be more governed by emotions and may less likely to manage and self-regulate themselves. It may also reflect a chicken and egg situation, that is, if students have high social emotional maturity, they are likely to be also more metacognitively aware, monitoring their task demands as well as being more evaluative and thus, able to set appropriate goals and be more motivationally oriented to achieve.

As Turner and Husman (2008) has emphasized, motivation does not occur in an emotional vacuum. Indeed, "Some sort of affect accompanies most cognitive events; affect is a by-product or antecedent to motivational processes such as goal setting" (Corno, 2000, p. 660). Available evidence suggests that social emotional skills are important, but further evidence is needed to determine to what extent they relate to learning. Prior research mainly focused on the link between different types of emotions and motivation, such as enjoyment, boredom, hope, anxiety, pride, shame, etc. (e.g., Turner & Schallert, 2001; Weiner, 1985). Some researchers have focused on individual differences and found that individuals differ in their ability to perceive, understand, and utilise emotional information (Salovey & Mayer, 1990). As Salovey, Bedell, Detweiler, and Mayer (2000) have suggested that these student abilities may contribute to intellectual well-being and growth, it is essential for educators to understand which emotion factors may influence which kind of students in which learning outcomes. The present paper has attempted merely to address this significant link between SEM and motivation and achievement outcomes.

From the results, we may assumed that students' ability to manage, monitor and control their social emotions was consistently positively associated with approach-oriented goal

pursuit. Specifically, children who are more aware of themselves, are more capable of managing their emotions as well as their relationship with others, are able to make responsible decisions intend to approach tasks with the aim to succeed. Nonetheless, this pattern was reversed for work-avoidance goals. Those who are poor at self-awareness, emotional control, relationship management or making responsible decisions typically choose to avoid failure when performing a task. This work avoidance orientation may impair their motivation and subsequent performance which may lead to learned helplessness in learning. Our findings were in line with the theoretical proposals. Researchers have emphasized the importance of students' emotional control (e.g., Lam & Kirby, 2002; Mayer & Salovey, 1997). Our data also indicated that students' ability to control their emotion is associated with their achievement motivation. Lam and Kirby (2002) argue that individuals who are able to accurately recognize emotions are also able to determine whether particular emotions distract or facilitate the completion of certain tasks. This ability to discriminate amongst and manage emotions may assist with decision-making and planning which could contribute to greater academic performance (Mayer & Salovey, 1997). In contrast, deficiencies in SEC such as ill-defined emotional perception, inappropriate expression, and lack of regulation may inhibit academic success. The ability to have a clear understanding of oneself, manage emotions and relate to others may help students to handle anxiety-arousing situations, such as taking tests or starting new projects (Lopes & Salovey, 2006), and is generally essential for learning. Based on our data, this capacity affects how students approach a given task in significant ways. The positive link between most of the SEC factors and achievement scores found in the present study has provided further evidence that SEC plays an important role in children's school performance.

In drawing implications from this line of research, an adaptive motivational climate that nurtures SEM and achievement may be critical everywhere. The manner they are expressed or applied should vary according to culture and context (Lopes & Salovey, 2006). Teachers need to strike a delicate balance between recognizing and validating students' self-perceptions whilst encouraging them to develop and nurture an SEL environment. Researchers have suggested a variety of ways to enhance SEM (Bernard, 2006; Ragozzino, Resnik, Utne-O'Brien & Weissberg, 2003). Pedagogy SEM principles that stress on the social and emotional dimension as well as provision of relevant real-life, age-appropriate activities that enhance reflection and intrinsic motivation in learning may encourage more purpose-driven learning and achievement of students' dispositions, goals and learning outcomes. Curriculum designers may incorporate some of these elements in various disciplines of the curriculum. Role-plays on various dilemma issues or discussion on interesting quotations e.g., "*The greatest barrier to success is the fear for failure*" may assist children to be aware of how they can take control of their academic fears. Open-ended questions that address children's SEM after story-telling sessions or watching a video-clip can assist them to self-manage their emotions and guide them to communicate positively rather than aggressively. These will also enhance emotional control and relationship management. While experimenting various techniques and strategies to enhance SEM, we also need to consider course activities as well as the learning environment. Long-term improvements and success in children's academic and social attainments will only be achieved through a complex mix of teachers', curriculum designers', and parents' concerted efforts. Their attitudes, the pedagogies at school, the course work in a lesson, along with parents' fostering at home will model the way that children acquire their SEC in a natural way, which subsequently affects how children emotionally and academically behave in schools.

References

- Asher, S. R., Renshaw, P. D., & Hymel, S. (1982). Peer relations and the development of social skills. In S. G. Moore and C. R. Cooper. (Eds.) *The young child: Reviews of research* (Vol. 3, pp. 137-158). Washington DC: National Association for the Education of Young Children.
- Beland, K. (2007). Boosting social and emotional competence. *Educational Leadership*, 64(7), 68-71.
- Bernard, M. E. (2006). It's time we teach social-emotional competence as well as we teach academic competence. *Reading & Writing Quarterly*, 22, 103-119.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Butler, R. (1992). What young people want to know when: The effects of mastery and ability goals on interest in different kinds of social comparisons. *Journal of Personality and Social Psychology*, 62, 934-943.
- Butler, R. (1993). Effects of task and ego-achievement goals on information seeking during task engagement. *Journal of Personality and Social Psychology*, 65, 18-31.
- Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Mahwah, NJ: Erlbaum.
- Chang, S. C., Kaur, B., Koay, P. L., & Lee, N. H. (2001). An exploratory analysis of current pedagogical practices in primary mathematics classroom. *The NIE Researcher*, 1(2), 7-8.
- Collaborative for Academic, Social, and Emotional Learning (CASEL). (2003). *Safe and sound: An educational leader's guide to evidence-based social and emotional learning (SEL) programs*. Chicago: Author.
- Corno, L. (2000). Special double issue on conceptions of volition: Theoretical investigation and studies of practice. *International Journal of Educational Research*, 33, 659-663.
- Dymnicki, A. B. (2006). *The impact of school-based social and emotional development programs on academic performance*. Unpublished master's thesis, University of Illinois at Chicago, Chicago.
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2008). *Enhancing students' social and emotional learning promotes success in school: A meta-analysis*. Manuscript submitted for publication.
- Durlak, J. D., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology*, 25, 15-152.
- Ee, J. (1998). Relationships among teachers' classroom orientations, strategy-based instruction and students' goal orientations, self-regulated learning and achievement. Unpub. PhD Thesis, The University of Newcastle, Australia.
- Eisenberg, N. (1986). *Altruistic emotion, cognition, and behavior*. Hillsdale, NJ: Erlbaum
- Elias, M. J., Zins, J. E., Graczyk, P. A., & Weissberg, R. P. (2003). Implementation, sustainability, and scaling of social-emotional and academic innovations in public schools. *School Psychology Quarterly*, 32, 303-319.
- Foong, P. Y. (2004). Engaging mathematics curriculum: Some exemplary practices in Singapore primary schools. *Teaching and Learning*, 25(1), 115-126.
- Greenhalgh, P. (1994). *Emotional growth and learning*. London: Routledge.
- Hill, S., & Hill, T. (1990). *The collaborative classroom: a guide to cooperative learning*. South Yarra: Eleanor Curtin.

- Ho, K. F., & Hedberg, J. G. (2005). Teachers' pedagogies and their impact on students' mathematical problem solving. *Journal of Mathematical Behavior*, 24(3 & 4), 238-252.
- Jagacinski, C. M., & Nicholls, J. G. (1984). Conceptions of ability and related affects in task involvement and ego involvement. *Journal of Educational Psychology*, 76, 909-919.
- Jagacinski, C. M., & Strickland, O. J. (2000). Task and ego orientation The role of goal orientations in anticipated affective reactions to achievement outcomes. *Learning & Individual Differences*, 12(2), 189-208.
- Jöreskog, K. G., & Sörbom, D. (2005). *LISREL 8.72: Structural equation modeling with SIMPLIS command language*. Chicago: Scientific Software International.
- Kaur, B. (2003). Students' and teachers' perspectives on mathematics instruction in Singapore schools [Monograph]. *The Mathematics Educator*, 85-96.
- Kopp, C. B. (1989). Regulation of distress and negative emotions: A developmental view. *Developmental Psychology*, 25, 343-354.
- 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. *Journal of Social Psychology*, 142, 133 - 145.
- Lau, S., Liem, A. D., & Nie, Y. (2008). Task- and self-related pathways to deep learning: The mediating role of achievement goals, classroom attentiveness, and group participation. *British Journal of Educational Psychology*, 78, 639-662.
- Liff, S. B. (2003). Social and emotional intelligence: Applications for developmental education. *Journal of Developmental Education*, 26(3), 28-32.
- Litvack-Miller, W., McDougall, D., & Romney, D.M. (1997). The structure of empathy during middle childhood and its relationship to prosocial behavior. *Genetic, Social, and General Psychology Monographs*, 123, 303-324.
- Lopes, P. N., & Salovey, P. (2006). Toward a broader education: Social, emotional, and practical skills. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 76-93). New York: Teachers College Press.
- Maccoby, E. (1983). Social-emotional development and response to stressors. In N. Garmezy & M. Rutter (Eds.), *Stress, coping, and development in children* (pp. 217-234). New York: McGraw-Hill.
- Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical process: In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling techniques*. Hillsdale, NJ: Erlbaum.
- Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indices in confirmatory factor analyses: the effect of sample size. *Psychological Bulletin*, 103, 391-410.
- Martin, A. J. (2009). Motivation and engagement across the academic life span. *Educational and Psychological Measurement*, 69, 794-824.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence* (pp. 3-31). New York: Basic Books.
- McInerney, D. M., & Ali, J. (2006) Multidimensional and hierarchical assessment of school motivation: Cross-cultural validation. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 26, 717-734.
- McInerney, D. M., Yeung, A. S., & McInerney, V. (2001). Cross-cultural validation of the Inventory of School Motivation (ISM): Motivation orientations of Navajo and Anglo students. *Journal of Applied Measurement*, 2, 135-153.

- Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology*, 80, 514-523.
- Miller, P.A., & Eisenberg, N. (1988). The Relation of Empathy to Aggressive and Externalizing / Antisocial Behavior. *Psychological Bulletin*, 103 (3), 324-344.
- Miller, P., & Jansen O.D.H.M. (1997). Emotional, cognitive, behavioral, and temperament characteristics of high empathy children. *Motivation and Emotion* 21 (1), 109-125.
- MOE (2007). *Ministry of Education Mathematics Syllabus – Primary*, Singapore: Curriculum Planning and Developmental Division.
- Moshman, D., & Geil, M. (1998). Collaborative reasoning: Evidence for collective reality. *Thinking and Reasoning*, 4, 231–248.
- Nastasi, B. K., & Clements, D. H. (1991). Research on cooperative learning: Implications for practice. *School Psychology Review*, 20(1), 110-131.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328–346.
- Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology*, 77, 683-692.
- Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, NJ: Erlbaum.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, 37(2), 91–105.
- Pekrun, R., & Hofmann, H. (1999). LernundLeistungsemotionen: Erste Befunde eines Forschungsprogramms [Emotions in learning and achievement: First results of a program of research]. In R. Pekrun & M. Jerusalem (Eds.), *Emotion, Motivation und Leistung* (pp. 247–267). Göttingen, Germany: Hogrefe.
- Preacher, K. T. & Leondardelli, G. J. (2010-2011). Calculation for the Sobel Test: An Interactive Calculation Tool for Mediations Tests. Accessed on October 26, 2011 from <http://www.quantpsy.org/sobel/sobel.htm>
- Ragozzino, K., Resnik, H., Utne-O'Brien, M., & Weissberg, R. P. (2003). Promoting academic achievement through social and emotional learning. *Educational Horizons*, 81(4), 169-171.
- Roschelle, J., & Teasley, S. D. (1995). The construction of shared knowledge in collaborative problem solving. In C. O'Malley (Ed.), *Computer Supported Collaborative Learning* (pp. 69-97). Berlin: Springer.
- Salovey, P., Bedell, B. T., Detweiler, J. B., & Mayer, J. D. (2000). Current directions in emotional intelligence research. In M. Lewis, & J. M. Haviland (Eds.), *Handbook of emotions* (2nd ed., pp. 504-520). New York: Guilford Press.
- Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition, and Personality*, 9, 185 – 211.
- Samaha, N. V., & DeLisi, R. (2000). Peer collaboration on a nonverbal reasoning task by urban minority students. *Journal of Experimental Education*, 69(1), 5–14.
- Strayer, J. & Schroeder, M. (1989). Children's helping strategies: Influences of emotion, empathy and age. In N. Eisenberg (Ed.), *New directions for child development, No. 44: Empathy and related emotional responses* (pp.85–105). San Francisco: Jossey-Bass.
- Tan, I. G. C., Sharan, S. & Lee, C. K. E. (2007). Group investigation effects on achievement, motivation, and perceptions of students in Singapore. *Journal of Educational Research*, 100(3), 142-154.

- Taylor, R. D. (2006). *A meta-analytic review analyzing the follow-up effects of school based-universal studies*. Unpublished master's thesis, University of Illinois at Chicago, Chicago.
- Titz, W. (2001). *Emotionen von Studierenden in Lernsituationen* [University students' emotions at learning]. Munster, Germany: Waxmann.
- Turner, J. E., & Husman, J. (2008). Emotional and cognitive self-regulation following academic shame, *Journal of Advanced Academics*, 20(1), 138-173.
- Turner, J. E., & Schallert, D. (2001). Expectancy-value relationships of shame reactions and shame resiliency. *Journal of Educational Psychology*, 93, 320–329.
- Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Wang, M. C., Haertel, G. D., & Walberg, H. J. (1997). Learning influences. In H. J. Walberg & G. D. Haertel (Eds.), *Psychology and Educational Practice* (pp. 199–211). Berkeley, CA: McCutchan.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548–573.
- Weissberg, R. P., & Elias, M. J. (1993). Enhancing young people's social competence and health behavior: An important challenge for educators, scientists, policy makers, and funders. *Applied and preventive psychology: Current scientific perspectives*, 2(4), 179-190.
- Wilczenski, F., Bontrager, T., Ventrone, P., &Correia, M. (2001). Observing collaborative problem-solving processes and outcomes. *Psychology in the Schools*, 38(3), 269-281.
- Wilson, D. B., Gottfredson, D. C., &Najaka, S. S. (2001). School-based prevention of problem behaviors: A meta-analysis. *Journal of Quantitative Criminology*, 17, 247-272.
- Wuensch, K. L. (2009). Statistical Tests of Models That Include Mediating Variables. Accessed on October 28, 2001 from core.ecu.edu/psyc/wuenschk/mv/multreg/mediationmodels.doc
- Yeap, B. H. (2005). Building foundations & developing creativity: An analysis of Singapore mathematics textbooks. *Proceedings of the Third East Asia Regional Conference on Mathematics Education*, Shanghai, China.
- Zeuli, J. S. & Ben-Avie, M. (2003). Connecting with students on a social and emotional level through in-depth discussions of mathematics. In N. M. Haynes, M. Ben-Avie & J. Ensign (Eds.), *How social and emotional development adds up* (pp. 36-64). New York: Teachers College Press.
- Zins, J. E., & Elias, M. J. (2006). Social and emotional learning: Promoting the development of all students. In G. G. Bear, K. M. Minke & A. Thomas (Eds.), *Children's needs III: Development, problems, and alternatives* (pp. 1–13). Bethesda, MD: National Association of School Psychologists.
- Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg, H. J. (Eds.). (2004). *Building academic success on social and emotional learning: What does the research say?* New York: Teachers College Press.
- Zins, J. E., Bloodworth, M. R., Weissberg, R. P., & Walberg, H. (2004). The scientific base linking social and emotional learning to school success. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 3-22). New York: Teachers College Press.
- Zsolnai, A. (2002). Relationship between children's social competence, learning motivation and school achievement, *Educational Psychology*, 22(3), 317-329.