Alberta Journal of Educational Research, Vol. 68.4, Winter 2022, 515-536

Science Teachers' Perceptions of Social-Emotional Learning: Lessons from Oman

Mohamed A. Shahat[1], Abdullah K. Ambusaidi[2], Abir Al Busaidi[2], Manal Al Qulhati[2]

1 Sultan Qaboos University and Aswan University, 2 Ministry of Education, Sultanate of Oman

The study aimed to identify science teachers' perceptions of social-emotional learning. A descriptive approach using quantitative methodology was followed, and a nationally representative sample of male and female science teachers (n = 1034) was used. A questionnaire was designed and used for data collection. The results revealed that science teachers have negative perceptions of emotional-social learning. Statistically significant differences were found between females and males. Also, there was a statistically significant difference based on grade level taught. However, there were no statistically significant differences in science teachers' perceptions due to years of teaching experience. Implications are discussed and recommendations are offered for promoting teachers' social-emotional competence.

L'étude visait à identifier les perceptions des enseignants de sciences sur l'apprentissage socio-émotionnel. L'étude a suivi une approche descriptive utilisant une méthodologie quantitative et elle repose sur un échantillon représentatif au niveau national de enseignants de sciences masculins et féminins (n = 1 034). Un questionnaire a été conçu et utilisé pour la collecte des données. Les résultats ont révélé que les enseignants de sciences ont des perceptions négatives de l'apprentissage émotionnel et social. On a constaté des différences statistiquement significatives entre les femmes et les hommes. De même, une différence statistiquement significative a été constatée en fonction du niveau scolaire enseigné. Cependant, aucune différence statistiquement significative dans les perceptions des enseignants de sciences n'a été constaté en fonction des années d'expérience d'enseignement. Les implications sont discutées et des recommandations sont proposées pour promouvoir la compétence socio-émotionnelle des enseignants.

Nowadays, students need a balanced set of cognitive, emotional, and social skills to achieve positive outcomes in school and life (Humphrey, 2013). Recently, several researchers have focused on investigating social and emotional factors and how they can be integrated into the educational process (Humphrey, 2013). It has been found that social and emotional factors are an essential element in students' learning and correspond to success in their academic and personal life (Weare & Gray, 2003). The Collaborative for Academic, Social, and Emotional Learning (CASEL) states that social-emotional learning (SEL) incorporates collaboration, self-awareness, the management of emotion in daily interactions with others, understanding and sympathizing with others, making responsible decisions, and the ability to apply knowledge effectively (CASEL, 2019).

Some studies (Barry et al., 2017; Goldberg et al., 2019; Ülvay & Ozkul, 2018; Wilkinson & Kao, 2019) have demonstrated the positive effect of social-emotional skills such as self-awareness, social-awareness, and problem-solving on students' mental health, motivation, academic performance, and the formation of positive behaviours. It has become evident that with the COVID-19 pandemic causing school closures around the world, there is a need for social-emotional learning to develop students' social skills and reduce the impact on students' mental health during times of stress (Yorke et al., 2021).

Teachers play an essential role in SEL by guiding students to express their feelings appropriately (Lam & Wong, 2017). Some researchers (Gillard, 2020; Loinaz, 2019; Zolkoski et al., 2020) have shown that students can be helped to better understand their feelings and the feelings of others when the teacher responds to their negative emotions with a positive attitude, and, as a result, students can learn to handle interaction with others more positively.

In contrast to research investigating the impact of social-emotional learning on students' learning and behaviour modification (Garner et al., 2018; Gillard, 2020; Oberle et al., 2016), several studies have examined teachers' perceptions of SEL (Dyson et al., 2019; Poulou et al., 2018; Esen-Aygun, & Sahin-Taskin, 2017; Youngblood, 2015). An understanding of these perceptions is an important step toward ensuring the effectiveness of teachers' social-emotional learning practices (Fischer, 2017). Therefore, the present study investigated how teachers perceive the social-emotional learning expectations placed on them within the classroom and the school in general.

Theoretical Background

Social-Emotional Learning (SEL) Skills

SEL has been defined slightly differently in the literature. For example, Durlak et al. (2011) described SEL as the "process of acquiring the skills to recognize and manage emotions, set and achieve positive goals, appreciate the perspectives of others, establish and maintain positive relationships, make responsible decisions, and handle interpersonal situations effectively" (p. 23). Similarly, Allison (2018) defined SEL as a "System through which students gain knowledge, attitudes, and skills necessary to effectively understand and manage emotions and relationships with self and others, demonstrate empathy, and set and achieve goals" (p. 4). The definition offered by Wenling and Sidhu (2020) is that SEL is a set of social-emotional capabilities and skills that help students establish good social relationships at school, and understand and control their feelings and emotions. As revealed by these definitions, there are five main skills represented by the term SEL. These five skills—self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—are described more fully below. *Self-awareness* refers to recognizing internal feelings and being able to realistically evaluate one's abilities, which requires a deep sense of self-confidence (Esen-Aygun, & Sahin-Taskin, 2017). It includes skills such as labelling one's feelings, relating feelings and thoughts to behaviour, accurate self-assessment of strengths and weaknesses, self-efficacy, and optimism (Esen-Aygun, & Sahin-Taskin, 2017). *Self-management* involves dealing with emotions to facilitate the completion of tasks and achievement of goals. It incorporates several skills, including stress management, self-control, self-motivation, and setting and achieving goals (CASEL, 2019). *Social awareness* is related to the feelings of others and includes appreciating the points of view of those around you, respecting diversity, empathy, understanding social and ethical behavioural norms, and

understanding and being able to utilize family, school, and community support (Garner et al., 2018). *Relationship skills* include being able to build relationships with diverse individuals and groups, communicating clearly, working cooperatively, resolving conflicts, and seeking help (Poulou et al., 2018). *Responsible decision-making* is associated with recognizing one's responsibility to behave ethically; considering the well-being of self and others; basing decisions on safety, social, and ethical considerations; and evaluating realistic consequences for various actions (Tilley, 2018).

The Role of SEL in Enhancing the Learning Process

The social and emotional aspects of learning can be addressed through the curriculum. Teachers need to employ teaching practices that help students develop their social and emotional development and provide them with equal learning opportunities (Kim & Hong, 2019; Oberle et al., 2016). Teachers have adopted various approaches to facilitate SEL, which can be categorized into three main broad categories (Cahill et al., 2019; CASEL, 2019; Ferreira et al., 2020; Grossman, 2021; UNESCO, 2021; Yeager, 2017; Youngblood, 2015):

- Explicit SEL lessons or curricula designed to enhance one or more SEL skills.
- Incorporating SEL enhancement practices into academic teaching or other school activities.
- Adopting strategies to promote a positive school-wide climate, including developing supportive relationships between teachers and students.

As is well known, students in this modern world face significant challenges that impact their chances of positive development and future success (Scifres, 2021). Hence, ensuring optimal social and emotional development has never been a more important part of the educational process (Berg et al., 2021; Cristovao et al., 2020; Elias, 2003; Weissberg, 2019). Most SEL studies have studied the impact of SEL skills on the academic achievement of students (Cristovao et al., 2020; Dunn, 2016; Hennessey & Humphrey, 2020; Kroese, 2020; Kuo et al., 2019; McCormick et al., 2015; Panayiotou et al., 2019; Starnes, 2017). For example, Davis et al. (2014) conducted a study on the use of SEL skills as an indicator of future academic results on a large sample of secondary students in the United States (n = 4797) and found that SEL skills measures are positively correlated with students' academic progress.

Other studies have emphasized the extracurricular importance of integrating SEL into school curricula. The National Research Council of the United States (2012), for example, has indicated that schools should focus on student development as a whole, rather than only academic learning, in order to better prepare them for life beyond school. Others have supported the use of SEL in schools due to the associated improvement in student behaviours (Beggs, 2020; Stang, 2021). Another type of study has focused on the relationship between SEL and students' motivation towards learning (Filiz & Durnali, 2020; Radu, 2014). Research has also shown that students who have been involved in SEL programs show improvement in self-awareness and self-confidence; control of motives; communication and cooperation skills; conflict resolution; and problem solving in a flexible, innovative, and tolerant manner (Durlak et al., 2011; Oberle et al., 2016).

It seems clear that SEL skills of students are enhanced by school curricula, but there are important factors that schools have to consider in order to facilitate effective SEL development such as creating new policies, training all school staff to achieve the goals of SEL, and designing school activities that can help students to develop their SEL skills (CASEL, 2019; Osher et al., 2016; Taylor et al., 2017).

SEL Framework in the Sultanate of Oman

Today, Oman is witnessing technological changes and economic, social, and cultural challenges. Considering these developments, the government of Oman has come to realize the importance of education in shaping the country's trajectory. The Ministry of Education and its policies therefore focus on raising current educational standards and making education equally available for all citizens in line with its rolling five-year plan (Oman Education Council, 2022).

The aim of the Oman Education Council is to work in coordination with relevant authorities to develop the national education strategy in line with the Oman government's vision for 2040. This strategy, which was implemented in 2013, involves the possible re-structuring of all aspects and levels of education in the Sultanate. According to the Oman Education Council (2022), the philosophy of education in Oman includes a set of guiding principles on how to develop all elements of the education process, including the following related to SEL:

- Develop an integrated personality in learners whereby they are enabled to acquire a harmonious balance of knowledge and social emotional skills to develop as a whole and meet challenges
- Reinforce the moral and social education of learners to allow the development of self-responsibility, a desire for social participation, and positive attitudes towards oneself and others
- Develop the ability of learners to participate in public issues through expressing opinions and accepting constructive criticism

Teachers' Perceptions of SEL and Associated Variables

Teachers' perceptions refer to thoughts or mental images related to their students and their professional activities, which are shaped by their life experiences, background knowledge, and professional influences (Dyson et al., 2019). Teachers' perceptions determine their passion for teaching and thus may positively guide their teaching practices and thinking (Lam & Wong, 2017).

Teachers' perceptions about SEL are influenced by various variables such as the grade level of the students they teach, culture, administrative support, their own social-emotional skills, student's gender, and demographic considerations of teachers such as gender, age, education level, teaching experience, training received and their role in a school (Madueke, 2014). Some researchers (Cross Francis et al., 2020; Russo et al., 2020; Schutz et al., 2020) have reported that elementary classrooms, including science classrooms, were described as more emotionally intense than secondary classrooms, which may impact SEL. In addition, according to Youngblood (2015), teachers who possess a higher social emotional competence are more likely to succeed in helping their students to interact in a respectful and socially skilled manner, and these positive experiences may lead to more favourable perceptions. Another factor that may impact teachers' perceptions of their role in teaching social emotional skills, as discussed by Zolkoski et al. (2020), is that many teacher training institutions do not provide future teachers with the necessary skills to teach social emotional competencies. Wenling and Sidhu (2020) conducted a survey to explore teachers' perceptions of SEL in early childhood centres in Shanghai, China and found that the teachers surveyed had moderately positive perceptions of SEL in the selected schools. They also revealed significant differences in teachers' perceptions of SEL based on teacher qualification and type of school; however, no significant differences were recorded based on the school's location

or teaching experience. Another study, by Huynh et al. (2018), indicated that regardless of differences in educational background and years of experience, all teachers were aware of the challenges and importance of implementing SEL in primary schools.

Teachers' perceptions of SEL are considered of fundamental importance, especially since teachers are the leading implementers of SEL programs in schools (Burgin et al., 2021). Huynh et al. (2018) indicated that teachers' positive perceptions of SEL and their motivation to develop students' SEL skills are significant factors that can affect teachers' implementation of SEL. Fischer (2017) conducted a study using a group of teachers from Cook County, Illinois to uncover teachers' perceptions and knowledge of social and emotional learning skills. The results indicated that most teachers believe maintaining social-emotional learning standards is essential for students' learning. The study also revealed that teachers lack knowledge of socio-emotional learning standards, and hence there was limited application of these standards in planning their lessons. Similarly, a study by Wilkinson and Kao (2019) regarding aspects of socio-emotional learning revealed that teachers did not consider SEL their responsibility, despite their awareness of its importance in developing children's learning. Another study that revealed teachers' belief in the importance of SEL as part of their students' education was conducted by Dyson et al. (2019); they found that most teachers believed the key to success in promoting SEL among students lies in establishing connections between students and teachers through respect, care, participation, listening, trust, and empathy. Ee and Cheng (2013) reported that most teachers believed it was easier to integrate SEL in language subjects than in mathematics and science subjects due to the nature of the course content. However, this belief is not supported by the literature (Loinaz, 2019; Whitcomb & Merrell, 2012). A study conducted in Oman by Almatari et al. (2022) after the Covid-19 pandemic showed statistically significant differences in teachers regarding the key SEL competency of social awareness in favour of female teachers. There were no statistically significant differences related to gender in the degree to which teachers possess social learning competencies.

Based on the literature discussed above, and noting the lack of related studies in this context, the researchers of the present study conducted a sizeable research project funded by the Ministry of Higher Education and Innovation in Oman to investigate science teachers' perceptions of SEL.

Aims and Research Questions

The current study aimed to 1) identify Omani science teachers' perceptions about social-emotional learning (SEL); 2) identify the effects of science teachers' gender, teaching experience, and grades taught on their perceptions of SEL; and 3) propose an Arabic research instrument that can be used to assess social-emotional learning. The following two research questions (RQs) are addressed:

RQ1: What are Omani science teachers' perceptions about social-emotional learning?

RQ2: Do perceptions regarding social-emotional learning differ according to science teachers' characteristics such as a) gender, b) teaching experience and grades taught, and the interaction between the two variables.

Methodology

Participants

The sample consisted of male and female science teachers (n = 1034) teaching grades 1–12 integrated science or science subjects (biology, chemistry, and physics). They were selected from different schools in five Omani regions using a stratified random sampling method. This sampling method allowed a representative sample of teachers to be selected in each category (i.e., gender, teaching experience, and grades taught). According to Cohen et al. (2000), stratified random sampling is a helpful blend of randomization and categorization, which enables both quantitative and qualitative research to be undertaken. Official permission from the Omani Ministry of Education was obtained to select the sample of teachers and collect the data. The survey was administered via Google Docs to teachers responsible for varying grade levels (1–12) in schools in different geographic locations within each region such as rural, mountainous, and urban areas. In the Oman education system, females study in separate schools from males in grades 5–12, but for grades 1–4 both male and female students are taught together mainly by female teachers. The numbers of teachers and students in each school were taken into consideration when the instrument was sent to participants. In the academic year 2020/2021, the survey was given to selected teachers in participating schools at the same time under the supervision of their science supervisors. Table 1 shows the sample distribution according to the three study variables.

Instrumentation

The researchers designed a Social Emotional Learning Scale (SELS) after reviewing previous literature related to attitudes (Ee & Cheng, 2013; Dyson et al., 2019; Loinaz, 2019). The scale uses a five-point Likert scale from *strongly agree* to *strongly disagree*. Since the sample target was science teachers, and the science curriculum in Oman is taught in Arabic, the SELS was prepared in Arabic. The first draft consisted of 35 (24 positive and 11 negative items) divided into four domains. For the validation process, the pilot SELS was given to six professors specializing in teaching science and assessment from Sultan Qaboos University and the Omani Ministry of Education. They were asked to provide their opinions on the suitability of this scale in achieving the study's aim, the appropriate items corresponding to the four domains, the accuracy of the language used, and whether any items needed to be added or omitted. In response to the experts' opinions, some items and the layout were modified to make it easier for teachers to respond. Most suggested modifications were acted upon, for instance some items were reworded, reordered, and/or regrouped into different domains. The amended SELS divided the items into five domains (see Table 2). These are 1) Meaning of Social-Emotional Learning, 2) Social-Emotional Learning

Table 1

Distribution of the Sample According to the Study Variables

Gender	Years of Teaching Experience		Grades Taught	
	<10	≥10	Grades 1–4	Grades 5–12
Male	46	306	-	352
Female	265	417	384	298
Total	311	723	384	650

Table 2

Internal Reliability and Distribution of Items in the Five Domains of the SELS

Dimension	No. of items	Example of items	Reliability (α)
Meaning of Social Emotional Learning (D1)	5	Providing students with the knowledge, attitudes, values, and skills necessary to understand and manage emotions and make responsible decisions.	.68
Social-Emotional Learning Skills (D2)	7	It cannot be taught to students, as it is inherited from parents.	.70
Values and Behaviours of Social Emotional Learning (D3)	8	Using cooperative learning to enhance social-emotional learning skills.	.67
The Roles of Social-Emotional Factors in Enhancing the Learning Process (D4)	5	Maintaining the gap between high achievers and low achievers by focusing on high achievers.	.71
The Status of Social-Emotional Learning in the School (D5)	6	It is well practiced by providing an appropriate environment for students to practice social and emotional learning skills.	.72
The whole scale	31		.84

Skills, 3) Values and Behaviours of Social-Emotional Learning, 4) The Role of Social-Emotional Learning in Enhancing the Learning Process, and 5) The Status of Social-Emotional Learning in the School. The authors believe that these five domains are the best method to determine teachers' perceptions of social-emotional learning in an Omani context. The internal consistency coefficient (Cronbach's Alpha) was calculated for each domain, and the SELS as a whole, to check the SEL's reliability. The Cronbach's Alpha for the domains (Table 2), were acceptable ($\alpha > .65$) (Griethuijsen et al., 2014). Table 2 also shows the distribution of the items in the SELS.

Table 3 shows positive moderate bivariate correlations between the dimensions, and there are strong correlations between each dimension and the whole score in the survey. All this evidence demonstrates the acceptable internal consistency of the instrument. The final version of SELS consisted of 31 items and was administered to the study sample electronically.

Data Analysis

To ensure the discriminant validity of the instrument, a bivariate correlation between the five domains and the whole survey was estimated. To confirm a theoretical five-factor model, exploratory factor analysis (EFA) was used. To estimate the reliability, Cronbach's Alpha values were calculated. Values higher than .60 would indicate that the SELS is a reliable instrument (Field, 2009). Each domain and item related to science teachers' perceptions regarding SEL in the social-emotional learning scale (SELS) was statistically analysed according to gender, teaching experience, and grade level taught. Using SPSS version 25 software, positively worded items were coded as *strongly agree* = 5, *agree* = 4, *neutral* = 3, *disagree* = 2, and *strongly disagree* = 1. For negatively worded items, the coding was reversed (Aiken, 1997). In an attempt

Table 3

Bivariate Correlations Between the Dimensions and the Whole Scale

Dimension		D1	D2	D3	D4	D5	Whole Survey
D1	Pearson Correlation	1	.38**	.46**	.35**	.30**	.68**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N		1034	1034	1034	1034	1034
D2	Pearson Correlation		1	.47**	.55**	.46**	.77**
	Sig. (2-tailed)			.000	.000	.000	.000
	N			1034	1034	1034	1034
D3	Pearson Correlation			1	.57**	.45**	.78**
	Sig. (2-tailed)				.000	.000	.000
	N				1034	1034	1034
D4	Pearson Correlation				1	.47**	.80**
	Sig. (2-tailed)					.000	.000
	N					1034	1034
D5	Pearson Correlation					1	.69**
	Sig. (2-tailed)						.000
	N						1034
Survey	Pearson Correlation						1
	Sig. (2-tailed)						
	N						

Note. ** Correlation is significant at the 0.01 level (2-tailed)

Table 4

Range of Mean Values for Each Category of SEL

Level of Perceptions	Range of Mean Value
Very Positive	4.21-5.00
Positive	3.41-4.20
Neutral	2.61-3.40
Negative	1.81-2.60
Very Negative	1.00-1.80

to measure Omani science teachers' perceptions about SEL (RQ 1), the mean value of each item and domain was calculated and then classified into five categories: *very positive*, *positive*, *neutral*, *negative*, and *very negative*, as shown in Table 4. The range of the means was determined according to the following formula (Al-Qamish & Kharbasha, 2009):

$$\text{Length of interval} = \frac{Highest\ value(5)}{Lowest\ value(1)} \div \text{number of options} = (5\text{-}1) \div 5 = 0.80$$

Subsequently, this value (0.80) was added to the minimum value, which was 1. Following this, the result (1.80) was added to the interval length (0.80), and this process was repeated until the maximum value of 5.0 was reached (see Table 4).

To identify significant differences between groups of science teachers with certain characteristics (RQ 2), independent sample t-tests and multivariate analysis were used.

Results

This section presents the results of an exploratory factor analysis (EFA) of the instrument items as well as the results related to the research questions.

The results of an exploratory factor analysis showed the multifactorial structure of the components of teachers' perceptions of SEL. There were five factors. The first factor comprised eight items that explained 29.38% of the variance, with factor loadings from 0.36 to 0.62. The second factor was comprised of seven items that explained 12.30%, with factor loadings from 0.31 to 0.64. the Third factor was comprised of six items that explained 5.05%, with factor loadings from 0.27 to 0.45. The fourth factor was comprised of five items that explained 4.21%, with factor loadings from 0.29 to 0.51. And the fifth factor was comprised of five items that explained 3.83%, with factor loadings from 0.20 to 0.52.

Science Teachers' Perceptions Toward Social-Emotional Learning (RQ1)

To answer RQ1, the mean values, standard deviations, and perception levels were calculated for all domains (Table 5).

As can be seen from Table 5, science teachers have negative perceptions about SEL in all domains except the Status of Social-Emotional Learning in the School domain. The Social-Emotional Learning Skills domain received the second highest mean value compared to other domains, followed by the Values and Behaviours of Social-Emotional Learning and then by the Meaning of the Social-Emotional Learning domain. The Roles of Social-Emotional Factors in Enhancing the Learning Process received the lowest mean value among all domains.

To measure science teachers' perceptions for each item in the SELS, both mean values and standard deviations were calculated for each item and are presented in Table 6. Table 6 also provides the Cronbach's Alpha values of the items.

The results in Table 6 show that for many items in the questionnaire, science teachers responded negatively. In particular, regarding the Meaning of SEL domain, there was a low level of agreement with the statement “Enhancing positive behaviours in students and reducing

Table 5

Descriptive Statistics of Science Teachers' Perceptions of SEL

Domain	M	SD	Type of Perceptions
D1	1.85	0.482	Negative
D2	2.17	0.440	Negative
D3	1.94	0.390	Negative
D4	1.79	0.500	Negative
D5	2.29	0.367	Neutral
Overall	2.01	0.330	Negative

negative ones" (M = 1.58) compared to the other items. Also, "Providing students the knowledge, attitudes, values, and skills necessary to understand and manage emotions and make responsible decisions" received very negative responses (M = 1.73). In addition, the item "SEL helps students in the present but not long term" was responded to negatively (M = 2.16), suggesting that teachers did not see the long term value of SEL for their students.

Within the Social Emotional Learning Skills domain, the item "They include social awareness that enables students to adopt the views of others, appreciate the difference between individuals, and interact with them positively" received negative responses (M = 1.87) compared to the other items. Similarly, teachers responded negatively to the item "They include self-regulation, essential for school adjustment and academic achievement" (M = 1.90). In this domain, the majority of science teachers agreed with the statement "They do not help students in orderly thinking" (M = 1.80) suggesting a negative attitude towards SEL skills and their role in teaching. This contrasted markedly with the item "It has nothing to do with students' ability to make responsible decisions", which most teachers agreed with (M = 3.68).

Table 6

Mean Values and Standard Deviations of SELS and Reliability Coefficients of the Instrument Items

Items (grouped by domain)	SD	M	Perception	α
Meaning of Social Emotional Learning				
SEL means students are provided with the knowledge, attitudes, values, and skills necessary to understand and manage emotions and make responsible decisions.	0.63	1.73	Very Negative	0.83
I consider the emotional aspects as the basis of the learning process.	0.69	1.80	Very Negative	0.83
SEL helps students in the present but not long term (Negative item).	0.95	2.16	Negative	0.84
SEL means positive behaviours are enhanced and negative ones reduced.	0.63	1.58	Very Negative	0.83
SEL focuses on raising the achievement level of students.	0.82	1.96	Negative	0.83
Social-Emotional Learning Skills				
They cannot be taught to students, as they are inherited from parents. (Negative item).	0.89	3.52	Positive	0.83
They are acquired through the teacher, who is responsible for the emotional socialization of students, for instance, self-awareness. (Negative item).	0.84	3.49	Positive	0.84
They include self-awareness that enables students to learn effectively and participate in positive interactions with others.	0.84	2.51	Negative	0.83
They include self-regulation, which is essential for school adjustment and academic achievement.	0.61	1.90	Negative	0.83
They include social awareness that enables students to adopt the views of others, appreciate the difference between individuals, and interact with them positively.	0.59	1.87	Negative	0.83
They do not help students in orderly thinking (Negative item).	0.57	1.80	Negative	0.83
They have nothing to do with a students' ability to make responsible decisions. (Negative item).	0.91	3.68	Positive	0.83

Table 6 (continued)

Items (grouped by domain)	SD	M	Perception	α
Values and Behaviours of Social Emotional Learning				
I integrate some topics and skills related to SEL into the curriculum content.	0.62	1.84	Negative	0.83
I use cooperative learning to enhance SEL skills.	0.60	1.69	Very Negative	0.83
Using formal educational activities to help students acquire emotional, social relations skills.	0.66	1.82	Negative	0.83
I establish and maintain positive relationships between the teacher and his students.	0.59	1.60	Very Negative	0.83
I activate after-school programs and extracurricular activities in enhancing SEL skills.	0.69	1.84	Negative	0.83
I do not accept students' positive or negative feelings and discuss them, as they are not necessary practices. (Negative item).	1.03	3.71	Positive	0.83
I am using different teaching methods to engage students in creating a caring and responsible climate in the classroom.	0.61	1.72	Very Negative	0.83
SEL skills can be integrated into humanities-oriented subjects but not science-oriented subjects. (Negative item).	1.10	2.75	Neutral	0.85
The Roles of Social-Emotional Factors in Enhancing the Learning Process				
It maintains the gap between high achievers and low achievers by focusing on high achievers. (Negative item).	1.14	3.52	Positive	0.84
I am helping students learn safe and behavioural practices.	0.58	1.74	Very Negative	0.83
It enhances the student's sense of self-value and a sense of effectiveness and life challenges.	0.60	1.61	Very Negative	0.82
It encourages students to participate in class and have positive interactions between themselves and teachers.	0.61	1.59	Very Negative	0.82
Improving the relationship between teachers and students.	0.59	1.54	Very Negative	0.83
The Status of Social-Emotional Learning in the School				
It has nothing to do with the SEL aspects of students. (Negative item).	1.09	2.98	Neutral	0.86
It is well practiced by providing an appropriate environment for students to practice SEL skills.	0.79	2.17	Negative	0.84
It is not essential because the school environment hinders overall learning. (Negative item).	1.01	3.56	Positive	0.83
It should be utilized in the educational process to achieve benefits for students.	0.60	1.72	Very Low	0.83
Teachers and other co-workers do not value SEL as each teacher is interested in himself/herself. (Negative item).	0.99	3.55	Positive	0.83
Students in school only need academic competencies to achieve their educational goals	0.77	1.96	Positive	0.83

Regarding the third domain, Values and Behaviours of Social Emotional Learning, the item "Establishing and maintaining positive relationships between the teacher and his students" had a

very low level of agreement from teachers (M = 1.60). Showing a similar level of agreement was the item "Using cooperative learning to enhance social-emotional learning skills" (M = 1.69). Interestingly, one negatively worded item in this domain that science teachers tended to agree with was "I do not accept students' positive or negative feelings and discuss them, as they are not necessary practices" (M = 3.71). Here we can see that most teachers believe it is not important to consider students' positive or negative feelings and discuss them during their science classes.

For the fourth domain, The Roles of Social-Emotional Factors in Enhancing the Learning Process, all positively worded items had mostly very negative response from science teachers. The highest mean (M = 3.96) among the items was for "Maintaining the gap between high achievers and low achievers by focusing on high achievers", with a third of the sample believing that SEL maintained the gap between high achievers and low achievers rather than reducing it. The second highest mean (M = 1.74) was for "incorporating students into safe and behavioural practices".

Finally, for the last domain, The Status of Social Emotional Learning in the School, the item "SEL is well practiced by providing an appropriate environment for students to practice SEL skills." had the highest mean (M = 2.17) among the positive items. Likewise, the item "Students in school only need academic competencies to achieve their educational goals" had limited agreement (M = 1.96). However, regarding the negative items, the statements "SEL is not essential because the school environment hinders overall learning" and "Teachers and other co-workers do not value SEL as each teacher is interested in himself/herself" had the highest level of agreement (M = 3.56 and M = 3.55 respectively) from teachers. This means that teachers believed the school did not provide a productive environment for student learning or teacher engagement.

Science Teachers' Characteristics (RQ2a): Teachers' Gender

An independent-sample *t*-test value was used to determine if teachers' perceptions about SEL differ due to gender (Table 7).

For the scale as a whole, there was a significant difference ($t(1034) = 2.12$, $\rho<0.5$) between male and female teachers, with male teachers slightly more positive in their views about SEL. The male teachers' mean agreement value is significantly higher than female teachers in two domains (*D4*, $t(1034) = 3.26$, $\rho<0.01$) and (*D5*, $t(1034) = 4.29$, $\rho<0.01$). These values are categorized as negative perceptions in The Roles of Social-Emotional Factors in Enhancing the Learning Process domain and neutral perceptions in The Status of Social Emotional Learning in the School domain respectively.

Teachers' Teaching Experience and Grades Taught, and the Interaction Between the Two Variables (RQ2b)

Mean values and standard deviations were used to determine if teachers' perceptions of social-emotional learning differed according to teaching experience and grades taught (Table 8).

The mean values of the perceptions of science teachers with less than ten years of experience were higher in all five dimensions compared with science teachers with ten years of teaching experience and above. In addition, the mean values of science teachers' perceptions according to the grade level these teachers teach are very close, except for The Status of Social Emotional Learning in the School domain (D5). A multivariate analysis was used to determine whether these differences in average mean values were statistically significant (Table 9).

Table 7

Independent-sample t-test Results for Male and Female Science Teachers' Perceptions About SEL

Domain	Gender	*M*	*SD*	*t*-value at *df* (1034)	ρ
D1	Male	1.82	0.485	1.47	0.14
	Female	1.86	0.480		
D2	Male	2.21	0.45	1.76	0.08
	Female	2.15	0.43		
D3	Male	1.95	0.38	0.51	0.61
	Female	1.94	0.40		
D4	Male	1.86	0.47	3.26	0.001**
	Female	1.75	0.51		
D5	Male	2.35	0.35	4.29	0.001**
	Female	2.25	0.37		
Survey	Male	2.04	0.31	2.12	0.03*
	Female	1.99	0.33		

Note. ** significant at 0.001 level, * significant at 0.05 level

Table 8

Descriptive Statistics of Science Teachers' Perceptions According to Teaching Experience and Grades Taught

Domain	Years of Teaching Experience				Grades Taught			
	<10		≥10		Grades 1–4		Grades 5–12	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
D1	2.22	0.406	2.16	0.389	2.17	0.399	2.18	0.392
D2	2.33	0.420	2.30	0.015	2.32	0.409	2.31	0.426
D3	2.01	0.411	2.00	0.424	2.00	0.422	2.01	0.419
D4	1.80	0.528	1.78	0.489	1.78	0.522	1.79	0.487
D5	2.30	0.518	2.29	0.525	2.24	0.500	2.33	0.534

Table 9

Results of Multivariate Tests

Source of variance	Value	*F*	Hypothesis *df*	Error *df*	*P*
Teaching Experience	0.998	0.35	5.00	1.03	0.88
Grades Level	0.989	2.18	5.00	1.03	0.05*
Teaching Experience × Grades Level	0.995	1.04	5.00	1.03	0.39

Note. * significant at 0.05 level

Table 10

Test of Between–Subjects Effects

Source	Domain	Type III Σ of squares	*df*	M^2	*F*	*P*	Partial η^2
Grades Level	D1	1.84	1	1.84	7.95	0.01**	0.008
	D2	0.11	1	0.11	0.75	0.39	-
	D3	0.13	1	0.13	0.86	0.35	-
	D4	0.93	1	0.93	5.37	0.02*	0.005
	D5	3.20	1	3.20	0.10	0.99	-
Error	D1	237.82	1030	.23	-	-	
	D2	156.39	1030	.15	-	-	
	D3	154.41	1030	.15	-	-	
	D4	178.85	1030	.17	-	-	
	D5	197.76	1030	.19	-	-	

Note. ** significant at 0.01 level, * significant at 0.05 level; according to Cohen (1988) effect size .01 ~ small; .06 ~ medium; >.14 ~ large

Table 9 shows that, as far as teaching experience, and the interaction between teaching experience and grade level were concerned, there were no statistically significant differences in the teachers' perceptions towards SEL. However, there was a significant difference ($F(5, 1.03) = 2.18$, $\rho<0.5$) due to the different grade levels. To determine the direction of the differences in perceptions, a test of between-subjects' effects was calculated (as shown in Table 10).

From Table 10, we can see a significant difference was found only in D1, Meaning of SEL, $F(1, 1030) = 7.95$, $\rho < 0.5$)) and D4, The Roles of Social-Emotional Factors in Enhancing the Learning Process, $F(1, 1030) = 5.37$; $\rho<0.5$) in favour of teachers who teach in grades 5-12 (more positive perceptions). Effect sizes were small; partial η^2 was 0.008 and 0.005 in the two domains, respectively.

Discussion and Conclusion

This is one of very few studies in the Arab world that has examined science teachers' perceptions about SEL. The study results have shown that Omani science teachers have negative perceptions about SEL, and there are multiple potential explanations for these findings. First, this result could be due to science teachers focusing more on delivering science specific course content rather than giving much attention to SEL. Wilkinson and Kao (2019) indicated that teachers generally spend more time teaching subject specific knowledge as it is of the greatest importance to students. Most teachers disregard emotion and view education as a process by which students acquire knowledge that they are able to then demonstrate through a wide range of exams (Goldberg et al., 2019; Lam & Wong, 2017; Poulou et al., 2018). Second, it may be that the science teachers do not realize the importance of SEL in teaching science, so they do not bother to understand it and/or consider it during the teaching process. Previous studies have shown that teachers do not have enough knowledge about SEL, which negatively affects their perceptions about SEL (Esen-Aygun, & Sahin-Taskin, 2017). The third reason is that science teachers may see SEL as more of a

psychological factor beyond their control rather than one related to the curriculum (Goegan at al., 2017). Finally, school management factors may impact teachers' perceptions of enhancing SEL skills and the inclusion of SEL in their classroom practices. For example, a lack of teacher training programs that promote SEL may play a role in their perceptions (Loinaz, 2019). Also, the science curriculum in the Sultanate of Oman and its lack of explicit inclusion of SEL may be another reason for negative perceptions of science teachers toward SEL and its limited integration into the educational process (Goegan at al., 2017).

The findings revealed many misconceptions on the part of teachers. For instance, the majority of the science teachers held that SEL is acquired through teachers (M = 3.49), who are responsible for the emotional socialization of students; however, for skills such as self-awareness, they believed SEL is more appropriately handled by teachers specializing in emotional socialization and not science teachers. This result is consistent with a previous study conducted by Ee and Cheng (2013); they found that teachers thought it was easier to integrate SEL in language subjects than in mathematics and science subjects due to the nature of the course content. This belief is not supported by the literature, which shows that SEL can be used in any subject, but it depends heavily on teachers. For example, studies have shown that successful incorporation of SEL is dependent on teacher attitudes and behaviour (Loinaz, 2019; Whitcomb & Merrell, 2012). Another misconception uncovered by the results was that a third of the sample believed that SEL maintained the gap between high achievers and low achievers. In fact, SEL plays a vital role in narrowing the gap by supporting low achieving students (Cristovao et al., 2020; Hennessey & Humphrey, 2020; Kroese, 2020; Kuo et al., 2019). The results also indicate that most science teachers believe that school is not a place where SEL should be addressed. Perhaps this is because they have not witnessed SEL being integrated in the schools where they teach. Some studies (Osher et al., 2016; Taylor et al., 2017) have indicated that most teachers believe that the family is the only place where SEL should be addressed for students.

The second research question (RQ2) was to identify the effects of science teachers' gender, teaching experience, and grades on their perceptions of SEL. Independent-sample t-tests were used to determine if teachers' perceptions about SEL differ due to gender and teaching experience. The results revealed a significant difference between male and female teachers' perceptions about SEL, suggesting that male teachers view SEL as being of greater importance in the teaching process compared to female teachers. One argument is that this result might be due to males being more likely to attend in-service training programs that the Omani Ministry of Education provides as part of its commitment to achieving quality education and raising its standards through in-service training and restructuring (Oman Education Council, 2022). Another argument is that, due to male teachers being responsible for teaching male students after primary school, there may be some differences in boys' classrooms that prompt male teachers to be more inclined to incorporate SEL in their teaching. This result contradicts studies by Almatari et al. (2022) and Molina et al. (2022) that examined teachers' perceptions about SEL. They found that female teachers had more positive perceptions about SEL and a stronger desire to implement SEL than males. A possible explanation for the difference in findings compared to these previous studies is that we had a relatively large sample size in the present study (n = 1034), including a representative sample from various regions in Oman.

Regarding the other two variables (teaching experience and grades level), the results showed no significant difference between science teachers with less than ten years of teaching experience and science teachers with ten or more years of teaching experience. This result could be explained in many ways. First, as Collie et al. (2015) suggested, it might be that the concept of SEL is new to

all teachers regardless of their teaching experience, hence their perceptions are almost the same. Another argument is that the SEL elements might be practiced by all teachers, irrespective of their teaching experience (Ransford, et al., 2009).

Regarding the grade levels the teachers are currently teaching, the results showed no significant differences between the teachers who teach in grades 1–4 and those who teach in grades 5–12 in all domains except D1, Meaning of Social Emotional Learning and D4, The Roles of Social-Emotional Factors in Enhancing the Learning Process in favour of those teachers who teach grades 5–12. One possible explanation is that teachers in grades 5–12 practice the elements of SEL more than teachers in grades 1–4 due to the characteristics of the students in grades 5–12. That is, the older students may need more emotional support than students in grades 1–4, as was the case in a study by Haymovitz et al. (2018). Another possible explanation might be that the currently implemented science curricula encourages teachers to take care of students' SEL during the inquiry and problem solving activities, which are more prevalent in later grades (Shahat et al., 2021).

In conclusion, science teachers' perceptions of SEL have implications for classroom teaching and teacher training programs. These perceptions may positively or negatively affect the adoption and sustainability of SEL programs (Poulou et al., 2018), the teacher-student relationship, the implementation of pedagogical practices to enhance students' SEL skills (Fischer, 2017), and are connected with student learning outcomes (Collie et al., 2015).

Limitations

The data in this study were collected from a selected sample using a cross-sectional design at a single point in time, limiting possible causal inferences regarding the bidirectionality of any links. Follow-up research investigating the influence of teachers' perceptions of social emotional learning on students' academic performance is recommended. Another limitation in this study is that teachers' perceptions of SEL were assessed using a self-report measure. Therefore, we also recommend conducting future studies utilizing qualitative methods, including interviews and observations of real practices in the classroom, as well as quantitative methods such as questionnaires and tests for investigating teachers' perceptions and their students' learning outcomes. Furthermore, the sample used in this study was drawn from a single country—Oman. To enable the generalization of the findings to other countries, we recommend replicating the study using a representative sample of science teachers in various schools from different countries.

Future Directions for Teaching and Learning

The principal findings of this study are that, in the culturally specific context of Oman, science teachers' gender, teaching experience, and grade level are possible factors that may influence teachers' perceptions of SEL and students' learning outcomes. Additionally, this study offers a positive contribution to the literature in that the Arabic version of the scale used (SELS) demonstrated good psychometric parameters for use in Oman and could be used in other Arabic countries to analyse teachers' perceptions of SEL. An additional theoretical contribution of this study is the detailed descriptions of the five dimensions of the SELS scale. These five dimensions could be used as part of a diagnostic measure to identify strengths and weaknesses related to social-emotional learning. Such a measure might help education officials when conducting needs

analyses and training of science teachers to teach science while considering social-emotional factors. Teachers could also use peer evaluation to investigate the strengths and weaknesses of each other's performances when teaching science while considering social-emotional factors. These reports could then be used to document the best practices regarding teaching science in Omani science classrooms.

Another implication of this study is that the findings indicate that female teachers in different grades may need more professional training regarding SEL and may require additional in-service training to establish and enhance their capacity for social-emotional learning. Of course, training is essential for both genders for achieving quality science instruction. Designing workshops, and/or training programs for teachers and their supervisors is needed to improve their SEL competencies. It is also important to assess the influence of these training opportunities on teachers' practices at schools. Moreover, this study provided evidence that teaching experience influences teachers' perceptions of social-emotional learning. We recommend incorporating emotional-social learning skills into the science curriculum to encourage teachers to teach them effectively to students. To reach this goal in Oman's schools, there is a need to take advantage of the experiences of other countries in promoting social-emotional learning. It is also important to include teaching models for SEL skills in teachers' curriculum guides. In future research, we recommend conducting an analytical descriptive study to find out the difficulties science teachers face in implementing SEL programs. Also, there is a need to perform a similar study related to other dependent variables in schools.

Acknowledgment

The Omani Ministry of Higher Education, Research and Innovation financially supported the work in this article under the research grant (RC/GRG-EDU/CUTM/20/02).

References

Aiken, L. (1997). *Questionnaires and inventories: Surveying opinions and assessing personality*. John Wiley.

Allison, A. (2018). *Teachers' perceptions and practices regarding Social Emotional Learning (SEL) competencies* (MA thesis). Vancouver Island University. https://doi.org/10.25316/IR-3176

Almatari, A. S., Almoqbali, M. A., & Almaawali, I. M. (2022). Teachers' perceptions of social and emotional learning competencies in the schools of the second episode of basic education in Oman. *International Conference on Research and Development, (ICORAD) 1*(1), 181–191. https://doi.org/10.47841/icorad.v1i1.23

Al-Qamish, M. N. & Kharbasha, O. M. (2009). An Eraluation *(sic)* of the practical training programs for special education diplpma *(sic)* students in the Jordanian community colleges from trainee' perspectives and cooperative teachers' perspectives. *Journal of Educational and Psychological Sciences, 10*(1), 39–66. https://doi.org/10.12785/JEPS/100102

Barry, M. M., Clarke, A. M., & Dowling, K. (2017). Promoting social and emotional well-being in schools. *Health Education, 117* (5), 434–451. https://doi.org/10.1108/HE-11-2016-0057

Beggs, A. (2020). *The effects of social-emotional learning and teacher relationships on middle school student well-being*. [Master's thesis, St. Catherine University]. https:\\sophia.stkate.edu\maed\376

Berg, M., Talvio, M., Hietajarvi, L., Benitez, I., Cavioni, V., Conte, E., Cuadrado, F., Ferreira, M., Kosir, M., Martinsone, B., Ornaghi, V., Raudiene, I., Sukyte, D., Talic, S., & Lonka, K. (2021). The development

of teachers' and their students' social and emotional learning during the "Learning to be Project"-training course in five European countries. *Frontiers in Psychology, 12*, 1–17. https://doi.org/10.3389\fpsyg.2021.705336

Burgin, X., Coli, S., & Daniel, M. C. (2021). Exploratory study of Ecuadorian teachers' understanding of social emotional learning: An examination of primary school teachers. *GIST Education and Learning Research Journal, 22*, 125–146. https://doi.org/10.26817/16925777.964

Cahill, H., Kern, M. L., Dadvand, B., Cruickshank, E. W., Midford, R., Smith, C., Farrelly, A., & Oades, L. (2019). An integrative approach to evaluating the implementation of social and emotional learning and gender-based violence prevention education. *International Journal of Emotional Education, 11*(1), 135–152. https://files.eric.ed.gov/fulltext/EJ1213610.pdf

CASEL. (2019). *Core SEL competencies*. https:\\casel.org\core-competencies\

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Cohen, L., Manion, L. & Morrison, K. (2000). *Research methods in education*. 5th Edition, Routledge. https://doi.org\10.4324\9780203224342

Collie, R. J., Shapka, J. D., Perry, N. E., & Martin, A. J. (2015). Teachers' beliefs about social-emotional learning: Identifying teacher profiles and their relations with job stress and satisfaction. *Learning and Instruction, 39*, 148–157. https://doi.org/10.1016/j.learninstruc.2015.06.002

Cristovao, A. M., Candeias, A. A., & Verdasea, J. L. (2020). Development of socio-emotional and creative skills in primary education: Teachers' perceptions about the Gulbenkian XXI School learning communities project. *Frontiers in Education, 4*(160). https://doi.org/10.3389\feduc.2019.00160

Cross Francis, D. I., Hong, J., Liu, J., Eker, A., Lloyd, K., Bharaj, P. K., & Jeon, M. (2020). The dominance of blended emotions: A qualitative study of elementary teachers' emotions related to mathematics teaching. *Frontiers in Psychology, 11*(1865), 1–20. https://doi.org/10.3389\fpsyg.2020.01865

Davis, A., Solberg, V. S., de Baca, C., & Gore, T. H. (2014). Use of social emotional learning skills to predict future academic success and progress toward graduation. *Journal of Education for Students Placed at Risk (JESPAR), 19*(3-4), 169–182. https://doi.org/10.1080/10824669.2014.972506

Dunn, A. (2016). *Social emotional development's effect on academic achievement of children with special needs*. [Master's thesis, Sacred Heart University]. http://digitalcommons.sacredheart.edu/edl/13

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Dyson, B., Howley, D., & Shen, Y. (2019). Teachers' perspectives of social and emotional learning in Aotearoa New Zealand primary schools. *Journal of Research in Innovative Teaching and Learning, 12*(1), 68–84. https:\\doi.org\10.1108\JRIT-02-2019-0024

Ee, J., & Cheng, Q. L. (2013). Teachers' perceptions of students' social emotional learning and their infusion of SEL. *Journal of Teaching and Teacher Education, 1*(2), 59–72. https://doi.org/10.12785/jtte/010201

Elias, M. J. (2003). *Academic and social-emotional learning: Educational practices series-11*. Geneva, Switzerland: International Academy of Education and International Bureau of Education. https://www.iaoed.org/downloads/prac11e.pdf

Esen-Aygun, H. & Sahin-Taskin, C. (2017). Teachers' views of social-emotional skills and their perspectives on social-emotional learning programs. *Journal of Education and Practice, 8*(7), 205–215. https://files.eric.ed.gov/fulltext/EJ1137527.pdf

Ferreira, M., Martinsone, B., & Talic, S. (2020). Promoting sustainable social emotional learning at school through relationship-centred learning environment, teaching methods and formative assessment. *Journal of Teacher Education for Sustainability, 22*(1), 21–36. https://doi.org/10.2478/jtes-2020-0003

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Sage.

Filiz, B., & Durnali, M. (2020). Examining the relationship between academic motivation and social-emotional competency in student-athletes. *Inquiry in Education, 12*(2), 1–18.

Fischer, S. N. (2017). *Teacher perceptions of the social emotional learning standards* (Unpublished thesis). Governors State University, Illinois. https://opus.govst.edu/capstones/282

Garner, P. W., Gabitova, N., Gupta, A., & Wood, T. (2018). Innovations in science education: Infusing social emotional principles into early STEM learning. *Cultural Studies of Science Education, 13*, 889-903. https://doi.org/10.1007/s11422-017-9826-0

Gillard, A. (2020). Teachers' perspectives of students' social and emotional changes during an adventure-based program. *Journal of Outdoor Recreation, Education, and Leadership, 12*(3), 322-332. https://doi.org/10.18666/JOREL-2020-V12-I3-10207

Goegan, L. D., Wagner, A. K., & Daniels, L. M. (2017). Pre-service and practicing teachers' commitment to and comfort with social emotional learning. *Alberta Journal of Educational Research, 63*(3), 267–285. https://doi.org/10.11575/ajer.v63i3.56284

Goldberg, J. M., Sklad, M., Elfrink, T. R., Schreurs, K. M. G., Bohlmeijer, E. T., & Clarke, A. M. (2019). Effectiveness of interventions adopting a whole school approach to enhancing social and emotional development: A meta-analysis. *European Journal of Psychology of Education, 34*, 755–782. https://doi.org/10.1007/s10212-018-0406-9

Griethuijsen, R. A. L. F., van Eijck, M. W., Haste, H., den Brok, P. J., Skinner, N. C., Mansour, N., Gencer, A. S., & BouJaoude, S. (2014). Global patterns in students' views of science and interest in science. *Research in Science Education, 45*(4), 581–603. https://doi.org/10.1007/s11165-014-9438-6

Grossman, J. (2021). *Social-emotional learning and educator implementation*. (MA thesis). Northwestern College, Iowa. https://nwcommons.nwciowa.edu/education_masters/280/

Haymovitz, E., Houseal-Allport, P., Lee, R. S., & Svistova, J. (2018). Exploring the perceived benefits and limitations of a school-based social–emotional learning program: A concept map evaluation. *Children & Schools, 40*(1), 45–54. https://doi.org/10.1093/cs/cdx029

Hennessey, A., & Humphrey, N. (2020). Can social and emotional learning improve children's academic progress? Findings from a randomised controlled trial of the Promoting Alternative Thinking Strategies (PATHS) curriculum. *European Journal of Psychology of Education, 35*, 751–774. https://doi.org/10.1007/s10212-019-00452-6

Humphrey, N. (2013). *Social and emotional learning: A critical appraisal*. Sage. https://doi.org/10.4135/9781446288603

Huynh, S. V., Tran-Chi, V., & Nguyen, T. T. (2018). Vietnamese teachers' perceptions of social-emotional learning education in primary schools. *European Journal of Contemporary Education, 7*(4).874–881. https://doi.org/10.13187/ejced.2018.4.874

Kim, D., & Hong, C. E. (2019). Social and emotional learning in a classroom: Language arts and literacy teachers' perceptions and practices in South Korea and the United States. I.E.: *Inquiry in Education, 11*(2), Article 7, 1–19. https://digitalcommons.nl.edu/ie/vol11/iss2/7

Kroese, B. (2020). *Social-emotional learning and academic achievement*. [Master's thesis, Northwestern College]. https:\\nwcommons.nwciowa.edu\education-masters

Kuo, Y., Casillas, A., & Allen, J. (2019). Examining moderating effects of social emotional learning factors on academic achievement gains. [Technical Brief], *ACT Research & Policy*, 1-12. https://files.eric.ed.gov/fulltext/ED596121.pdf

Lam, L. T., & Wong, E. M. Y. (2017). Enhancing social emotional well-being in young children through improving teachers' social-emotional competence and curriculum design in Hong Kong. *International Journal of Child Care and Education Policy, 11*(5), Article 5, 1–14. https:\\doi.org\10.1186\s40723-017-0031-0

Loinaz, E. S. (2019). Teachers' perceptions and practices of social and emotional education in Greece, Spain, Sweden and the United Kingdom. *International Journal of Emotional Education, 11*(1), 31–48. https://files.eric.ed.gov/fulltext/EJ1213640.pdf

Madueke, N. A. (2014). *Teachers' perceptions of their responsibilities in teaching social emotional skills: A case study* (MA thesis). University of North Texas. https://digital.library.unt.edu/ark:/67531/metadc700052/

McCormick, M. P., Cappella, E., O'Connor, E. E., & McClowry, S. G. (2015). Social-emotional learning and academic achievement: Using causal methods to explore classroom-level mechanisms. *American Educational Research Association, 1*(3), 1–26. https:\\doi.org\10.1177\2332858415603959

Molina, A., Cahill, H., & Dadvand, B. (2022). The role of gender, setting and experience in teacher beliefs and intentions in social and emotional learning and respectful relationships education. *Australian Educational Researcher, 49*(2), 63–79. https:\\doi.org\10.1007\s13384-020-00420-w

National Research Council. (2012). *A framework for k-12 science education: Practices, crosscutting concepts, and core ideas*. The National Academies Press. https://doi.org/10.17226/13165

Oberle, E., Domitrovich, C. E., Meyers, D. C., & Weissberg, R. P. (2016). Establishing systemic social and emotional learning approaches in schools: A framework of schoolwide implementation. *Cambridge Journal of Education, 46*(3), 277–297. https://doi.org/10.1080/0305764X.2015.1125450

Oman Education Council (2022). *The most remarkable projects developed by the Education Council*. Author. https://www.educouncil.gov.om/downloads/5HsT4BW532Q3.pdf

Osher, D., Kidron, Y., Brackett, M., Dymnicki, A., Jones, S., & Weissberg, R. P. (2016). Advancing the science and practice of social and emotional learning: Looking back and moving forward. *Review of Research in Education, 40*(1), 644–681. https:\\doi.org\10.3102\0091732X16673595

Panayiotou, M., Humphrey, N., & Wigelsworth, M. (2019). An empirical basis for linking social and emotional learning to academic performance. *Contemporary Educational Psychology, 56*, 193-204. https:\\doi.org\10.1016\j.cedpsych.2019.01.009

Poulou, M. S., Bassett, H. H., & Denham, S. A. (2018). Teachers' perceptions of emotional intelligence and social-emotional learning: Students' emotional and behavioral difficulties in U.S and Greek preschool classrooms. *Journal of Research in Childhood Education, 32*(3), 363–377. https://doi.org/10.1080/02568543.2018.1464980

Radu, C. (2014). Emotional intelligence—How do we motivate our students? *Social and Behavioral Sciences, 141*, 271–274. https:\\doi.org\10.1016\j.sbspro.2014.05.047

Ransford, C. R., Greenberg, M. T., Domitrovich, C. E., Small, M., & Jacobson, L. (2009). The role of teachers' psychological experiences and perceptions of curriculum supports on the implementation of a social and emotional learning curriculum. *School Psychology Review, 38*(4), 510–532.

Russo, J., Bobis, J., Sullivan, P., Downton, A., Livy, S., McCormick, M., & Hughes, S. (2020). Exploring the relationship between teacher enjoyment of mathematics, their attitudes towards student struggle and instructional time amongst early years' primary teachers. *Teaching and Teacher Education, 88*, 1–9. https://doi.org/10.1016/j.tate.2019.102983

Schutz, P. A., Hong, J., & Cross Francis, D. (2020). *Teachers' goals, beliefs, emotions, and identity development: Investigating complexities in the profession*. Routledge.

Scifres, S. (2021). *K-5 teachers' perceptions of social emotional learning*. [Doctoral dissertation, Pepperdine University]. ProQuest Dissertations & Theses Global. (2531368854).

Shahat, M. A., Ohle-Peters, A., & Ambusaidi, A. (2021). Teaching with texts and pictures in science Classes: Teachers' attitudes and motivational orientations at different school levels. *Journal of Science Teacher Education, 33*(1), 107–123. https://doi.org/10.1080/1046560X.2021.1909231

Stang, L. (2021). *The effects of social-emotional learning strategies on promoting positive behavior on elementary students*. [Master's thesis, Saint Catherine University]. https:\\sophia.stkate.edu\maed/423

Starnes, L. (2017). *Effects of social-emotional education on pre-kindergarten student academic achievement*. [Doctoral dissertation, Liberty University]. https:\\digitalcommons.liberty.edu\doctoral/1620/

Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting positive youth development

through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development, 88*(4), 1156–1171. https://doi.org/10.1111/cdev.12864

Tilley, J. (2018). *Educator perceptions of social and emotional learning supports and interventions* [Doctoral dissertation, Middle Tennessee State University]. ProQuest Dissertations & Theses Global. (2167490275). https://eric.ed.gov/?id = ED595584

Ülvay, G. F., & Özkul, A. E. (2018). Social-emotional learning competencies scale of secondary students. *Eurasia Journal of Mathematics, Science and Technology Education, 14*(4), 1295–1304. https://doi.org/10.29333/ejmste/82938

UNESCO. (2021). *Social and emotional learning (SEL) in and through education: Taking stock for improved implementation. Concept Note*, Workshop 11-12 February 2021. https://en.unesco.org/sites/default/files/social-emotional-learning-though-education-february2021-cn-en.pdf

Weare, K., & Gray, G. (2003). *What works in developing children's emotional and social competence and wellbeing?* (Research Report No. 456). Nottingham, UK: Department of Educational and Skills.

Weissberg, R. P. (2019). Promoting the social and emotional learning of millions of school children. *Perspectives on Psychological Science, 14*(1), 65–69. https://doi.org/10.1177\1745691618817756

Wenling, Y., & Sidhu, G. K. (2020). Teachers' perceptions of social and emotional learning in early childhood centres in Shanghai, China. *Journal of Arts and Science Education Research, 7*(1), 1-11. www.ijvocter.com

Whitcomb, S. A., & Merrell, K. W. (2012). Understanding implementation and effectiveness of Strong Start K-2 on social-emotional behavior. *Early Childhood Education Journal, 40*(1), 63–71. https:\\doi.org\10.1007\s10643-011-0490-9

Wilkinson, J. E., & Kao, C. (2019). Aspects of socio-emotional learning in Taiwan's pre-schools: An exploratory study of teachers' perspectives. *International Journal of Child Care and Education Policy, 13*(1), 1–17. https://doi.org/10.1186\s40723-019-0057-6

Yeager, D. (2017). Social and emotional learning programs for adolescents. *The Future & Children, 27*(1), 73–94. https://files.eric.ed.gov/fulltext/EJ1145078.pdf

Yorke, L., Rose, P., Bayley, S., Wole, D., & Ramchandani, P. (2021). The importance of students' socio-emotional learning, mental health, and wellbeing in the time of COVID-19. 2021/025. *Research on Improving Systems of Education*. https://doi.org/10.35489/BSG-RISE-RI_2021/025

Youngblood, S. (2015). *Teachers' perspectives on implementing social-emotional learning standards* [Doctoral dissertation, Walden University]. https://scholarworks.waldenu.edu/dissertations/1527

Zolkoski, S. M., Aguilera, S. E., West, E. M., Miller, G. J., Holm, J. M., Sass, S., & Stokes, E. L. (2020). Teacher perceptions of skills, knowledge, and resources needed to promote social and emotional learning in rural classrooms. *The Rural Educator, 41*(3), 1–11. https://doi.org/10.35608/ruraled.v41i3.1098

Mohamed A. Shahat is an Assistant Professor of Science Education at Sultan Qaboos University (SQU), Oman, and an Associate Professor at Aswan University, Egypt. He earned his Ph.D. in science education from the University of Duisburg-Essen, Germany. He is currently leading various Omani national research projects at SQU, including STEM and entrepreneurship education. His research interests include science education, STEM/STEAM education, teacher education/professional development, entrepreneurship education, assessment, Rasch analysis, and emotional behaviour. He published several papers in high-ranked journals. He is a member of different national and international journal editorial boards.

Abdullah K. Ambusaidi is a Professor of Science Education. He received his Ph.D. from the Centre of Science Education at Glasgow University/UK. Currently, he is the undersecretary for education at the Ministry of Education/Oman. He worked before at Sultan Qaboos University and held several positions, including Director of the Center for Humanities Research and Dean of Postgraduate Studies. He has supervised over 80 master's and doctorate degrees in science education and is an external and internal examiner for more than 80 master's and doctoral dissertations. He has more than 150 published and accepted research papers in well-known international journals. He is a consultant for many educational projects in Oman, including TAMAM Project (school-based development) and Green Schools Initiative. He is also a leading researcher of various educational projects, such as the school garden project, ecotourism project, health education project, and the Omani Heritage Project in the school curricula.

Abir Al-Busaidi is a biology teacher. She received her bachelor's and master's degrees from Sultan Qaboos University. Her research interests include science, environmental education, and sociological education.

Manal Al-Qulhati is a chemistry teacher. She received her bachelor's and master's degrees from Sultan Qaboos University. Her research interests include science education, sociological education, environmental education, and scientific literacy.