



Emo-Sensory Intelligence in High School Teachers: Examining Gender and Age Dynamics in Iranian Educational Settings

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Abstract Given the importance of the emotional and sensory processing of information in education across different genders and ages, this study intends to examine the differences in emo-sensory intelligence among high school teachers in terms of gender and age. The ability to handle and manage emotions caused by sensory stimulation is referred to as emo-sensory intelligence. It is held that it can be a significant factor in teacher success, which might be affected by gender and age. To this end, this study surveyed 315 Iranian instructors using the emo-sensory intelligence scale. The results of statistical analyses showed that female teachers showed greater emo-sensory intelligence levels than male teachers. Furthermore, teachers between the ages of 30 and 40 had stronger emo-sensory intelligence compared to other age groups. The findings highlighted the importance of developing emo-sensory intelligence in teachers, particularly through specific strategies for male and younger teachers. In the end, the implications were presented, and some suggestions were made.

Keywords: *Emo-Sensory Intelligence, Emotion, Education, IQ, EQ*

1. Introduction

The practical application of knowledge through teaching is essential for any nation's economic, political, social, and cultural advancement. Consequently, educational systems across the globe, especially within developing societies, bear the responsibility of maximizing their resources and capabilities. Their focus should center on enhancing teaching quality and efficacy while equipping educators with the necessary intellectual, physical, and social competencies crucial for driving societal advancement (Sage, 2020). In this context, teachers, particularly those teaching in high schools, play a significant role in ensuring the delivery of high-quality education. Adolescence, a critical phase in the lives of high school students, marks a period when they strive to shape their future by selecting a field of study. As mentors, teachers are responsible for comprehensively addressing each student's needs and making well-informed decisions (Ahmed et al., 2019). Thus, effective teacher-student communication is important beyond imparting academic knowledge aligned with school curricula and employing

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diverse teaching methodologies. Teachers must engage with students to fulfill their educational requirements and attend to their social and emotional needs (Bonney et al., 2015; Pishghadam et al., 2021). Teachers need more than just knowledge to communicate with their students effectively; they require awareness and mastery of their emotions (Frenzel et al., 2021; Pishghadam et al., 2023). Given the significant impact of senses on emotional development and the overall quality of those emotions (Ebrahimi et al., 2020; Eglite, 2021), possessing a high emo-sensory intelligence quotient (ESQ) becomes imperative. ESQ represents the integration of emotional intelligence (EQ; Bar-On, 1997) and sensory intelligence (SQ; Lombard, 2007), encompassing the ability to recognize and manage emotions triggered by sensory stimuli (Pishghadam & Shayesteh, 2017). Individuals with a high ESQ level excel in identifying, expressing, monitoring, and regulating emotions evoked by their senses (Pishghadam, 2020). Therefore, in line with this intelligence framework, teachers with high ESQ are expected to communicate more effectively with teenage students and guide them aptly through their educational path.

Considering the recognized gender differences impacting intelligence levels (Srivastava & Bhatnagar, 2023) and the variations in intelligence levels across different age groups (Hertzog & Bleckly, 2001), along with the acknowledged influence of teachers' gender (Karaman, 2009) and age (Unsal, 2018) on their performance and teaching practices, this study was initiated. Its primary aim was to examine the emo-sensory intelligence of high school teachers within Iranian educational settings, where students typically range between the ages of 12 and 18. With that in mind, the study intends to examine the emo-sensory intelligence of high school teachers in terms of gender and age and answer the following research questions:

1. Are there significant differences between male and female high school teachers' emo-sensory intelligence?
2. Are there significant differences in high school teachers' emo-sensory intelligence across different age groups?

2. Theoretical Framework

2.1. Emo-Sensory Intelligence

Since its inception, scholars have held varying perspectives on intelligence, studying different definitions and features. Intelligence was first considered a unified concept consisting of one dimension, focusing more on the cognitive abilities of individuals, and used mostly the scales and concepts introduced by Binet and Simon (1905), Terman (1916), and Wechsler (1987).

The concept of intelligence as uni-dimensional changed later to be multi-dimensional and focused more on other aspects of intelligence, such as emotion. Salovey and Mayer (1990), Goleman (1995), and Bar-On (1997), as the first advocates of the concept of emotional intelligence, emphasized individuals' skills to identify and control their own and others' emotions (Pishghadam et al., 2019). Later on, Lombard (2007) presented sensory intelligence as a complementary aspect of intelligence, defining it as how sensory adjustments occur to fit with the surrounding environment. Pishghadam and Shayesteh (2017), in a study on colors in a culture, developed the concept of emo-sensory intelligence by addressing emotional intelligence and sensory intelligence to show the interplay between emotions and senses. This intelligence deals with the ability to recognize, monitor, and manage emotions induced by sensory stimuli (Pishghadam et al., 2020).

In their 2022 study, Pishghadam et al. conducted a comparative investigation of IQ, EQ, and ESQ with respect to their influence on university students' academic achievement. Their findings highlighted the importance of emotional intelligence and the auditory subscale of emo-sensory intelligence as indicators of academic performance among university students. In the same vein but from another perspective, Naji Meidani et al. (2022) examined the emo-sensory intelligence of male and female individuals. The outcomes of their study showed that women use their visual, olfactory, and tactile senses more often than men. Moreover, women often demonstrated greater proficiency in perceiving and employing their senses. In another study, Pouryazdanpanah Kermani (2022) examined the relationship between emo-sensory intelligence, cognitive learning strategies, metacognitive learning strategies, and students'

academic achievements. She found that emo-sensory intelligence played a significant role in enhancing learning strategies, resulting in improved academic performance.

Furthermore, Pishghadam et al. (2023) tried to examine the relationship between economic, social, and cultural capital and emo-sensory intelligence among university students in Iran and Afghanistan. The results of their study revealed that there is a link between students' cultural capital and their ESQ, which can impact their academic performance. Moreover, they found that Iranian students had higher levels of economic capital and emo-sensory intelligence than their Afghan counterparts.

All in all, although there is a paucity of research on emo-sensory intelligence, there is compelling evidence that teachers with high emo-sensory intelligence have an enhanced ability to perceive and manage their emotions. That is why any research showing different hidden aspects of teacher effectiveness can be valuable and contribute to effective communication between teachers and students. Two important variables in this regard are gender and age, which need to be scrutinized in more detail.

2.2. Intelligence across Gender and Age

Intelligence in men and women and its superiority has always been a worthwhile topic for research. Age, as an influential factor in intelligence studies, is also an important issue to scholars. Numerous studies have been conducted to determine whether there is a significant difference in intellect between men and women and whether this difference correlates with age. For instance, Lynn (1994) held the view that men outperformed women in verbal, reasoning, and spatial ability due to their larger brains than women. Lynn also claimed that IQ disparities between teenage girls and boys up to the age of 14 were minor, owing to girls' earlier maturation than boys. On the other hand, Berrocal et al. (2012) found that women had greater levels of emotional intelligence than men when exploring gender differences in emotional intelligence. Furthermore, they considered the variable age as a mediator and reported that there is no significant relationship between age and emotional intelligence in individuals.

Szymanowicz and Furnham (2012) conducted a study in which participants evaluated their proficiency in multiple intelligences, demonstrating gender-related perceptions. Men rated themselves better in linguistic, practical, and mathematical intelligence, but women rated themselves higher in social and emotional intelligence. Wechsler et al. (2014), on the other hand, investigated differences in crystallized intelligence between men and women and discovered no significant differences. Lynn's (2016) study, which looked at gender differences in general intelligence, found that men had comparatively higher cognitive scores than women. In contrast, Halpern and Jonathan (2019) reported findings that contradicted this, demonstrating no substantial difference in IQ between men and women. Lobote and Paneru (2021) investigated variations in emotional intelligence between male and female students, finding no significant overall difference between genders; however, girls surpassed boys in self-emotion variables. Reilly et al. (2022) investigated the impact of gender on self-estimated intellect, finding that males tended to rank higher in this setting. Giofre et al. (2022) investigated the association between children's gender and cognitive levels, concentrating on visual and crystallized intelligence. The data revealed that guys outperformed girls in several areas of intelligence.

Furthermore, various research has investigated the relationship between age and IQ, shedding light on its implications. Fariselli et al. (2006) discovered a substantial positive connection between age and improved emotional intelligence. They attributed this conclusion to the impact of educability and collected experience, highlighting their significance in improving emotional intelligence. Similarly, Sharma (2017) studied emotional intelligence in people aged 17 to 20, finding a steady increase trend in emotional intelligence levels as people moved from adolescence to adulthood and then into middle age. Furthermore, Fili (2016) investigated emotional intelligence in children aged 10 to 12, indicating differences across age groups. Their findings revealed that 12-year-old children performed better on emotion expression measures than other age groups, although 10-year-old children performed better on emotion perception scales than their counterparts. Manard et al. (2014) investigated the impact of age on cognitive control by investigating the mediating influence of fluid intelligence and processing speed. Their research found that the successful use of cognitive control processes in older people was partly dependent on available cognitive resources, as measured by fluid intelligence and data processing speed.

Furthermore, Chen et al. (2016) studied the relationship between age, emotional intelligence, and subjective well-being in people aged 20 to 79. According to their findings, emotional intelligence played a role as a mediator between age and subjective well-being. As individuals grew older, their emotional intelligence levels noticeably increased, enabling them to enhance their well-being. Similarly, Antony et al. (2018) examined the association between emotional intelligence and age among research participants. Although they did not find any correlation between these variables, they did discover that older individuals exhibited better skills in managing relationships.

As already mentioned and shown, scholars have found that there is compelling evidence that intelligence is an important factor in variables such as gender and age. That is why any endeavor in this respect can be valuable and shed more light on the intricate relationships between intelligence, gender, and age.

3. Methodology

3.1. Participants

The study consists of 315 teachers, comprising 179 females and 136 males. Participants were distributed across diverse age groups: 53 individuals were aged between 20 and 30, 79 fell within the 30-40, 128 were in the 40-50 range, 50 were between 50 and 60 years old, and five were aged over 60. Regarding teaching experience, participants had varying majors, including literature and humanities, sciences, mathematics and physics, and vocational sciences. Specifically, 14 individuals had been teaching for 1-5 years, 38 for 5-10 years, 69 for 10-15 years, 88 for 25-30 years, and 21 participants had over 30 years of teaching experience. Their teaching roles spanned across junior and senior high schools (grades 7-12) in Iran. It is important to note that the selection process involved convenience sampling, and the participation of these teachers was based on their willingness to participate in the research.

3.2. Instrument

3.2.1. Emo-Sensory Intelligence Scale

The emo-sensory intelligence scale devised by Pishghadam et al. (2020) encompasses 144 items categorized into six components: visual, auditory, olfactory, gustatory, tactile, and kinesthetic. Each component consists of 24 items that evaluate individuals' capacity to recognize, label, and manage six primary emotions—happiness, surprise, sadness, disgust, anger, and fear—elicited by these senses (see Appendix). Participants rated their replies on a 5-point Likert scale, with 1 being strongly disagree and 5 being strongly agree. The authors used Cronbach's Alpha to test the questionnaire's reliability, finding the following reliability coefficients: .80 for gustatory, .81 for tactile, .84 for kinesthetic, .90 for visual, and .91 for auditory and olfactory senses. The reliability coefficients for gustatory, tactile, kinesthetic, visual, auditory, and olfactory senses were determined using Cronbach's Alpha to be .80, .81, .84, .90, and .91, respectively. According to Pishghadam et al. (2020), these coefficients were estimated for both the six individual senses and the four underlying components.

3.3. Procedure

The emo-sensory intelligence scale, using Google Forms, was given to high school teachers. Data was collected during a six-month period from April to September 2022. The data obtained was analyzed using SPSS 23. Cronbach's Alpha was used to assess the reliability of the collected data. Furthermore, to assess any significant differences in teachers' ESQ with regard to their gender, independent samples t-tests were conducted. Regarding age, the one-way analysis of variance (ANOVA) was applied, followed by Bonferroni pairwise comparison tests to examine specific differences among age groups.

4. Results

4.1. Descriptive Statistics

Table 1 displays descriptive statistics, including mean and standard deviation, for ESQ.

Table 1*Descriptive Statistics for ESQ*

	Min	Max	Mean	SD
ESQ	279	724	513.52	86.61
Visual	53	120	86.19	13.26
Auditory	43	120	86.57	14.71
Olfactory	36	120	84.62	17.07
Gustatory	40	120	84.04	17.23
Tactile	43	120	85.61	17.06
Kinesthetic	49	125	86.50	16.89

4.2. Mean Differences

4.2.1. ESQ and Gender

Independent sample t-tests were conducted to investigate potential significant differences between males and females in relation to their ESQ (including its subconstructs). Table 2 reveals notable differences in ESQ levels (including its subconstructs) between males and females. Female teachers exhibit a higher level of ESQ than their male counterparts ($t(313) = 4.51, p = 0.00$). This pattern is consistently observed across all ESQ subconstructs, including visual ($t(313) = 5.80, p = 0.00$), auditory ($t(313) = 3.13, p = 0.00$), olfactory ($t(313) = 4.20, p = 0.00$), gustatory ($t(313) = 4.69, p = 0.00$), tactile ($t(313) = 3.90, p = 0.00$), and kinesthetic ($t(313) = 2.85, p = 0.00$).

Table 2*Independent Samples T-test for ESQ*

	Gender	N	Mean	SD	df	T	Sig. (2-tailed)
ESQ	Female	179	532.17	77.36	313	4.51	.00
	Male	136	488.98	92.14			
Visual	Female	179	89.79	12.22	313	5.80	.00
	Male	136	81.45	13.13			
Auditory	Female	179	88.80	13.55	313	3.13	.00
	Male	136	83.63	15.68			
Olfactory	Female	179	88.05	14.95	313	4.20	.00
	Male	136	80.10	18.61			
Gustatory	Female	179	87.89	15.39	313	4.69	.00
	Male	136	78.99	18.24			
Tactile	Female	179	88.80	15.06	313	3.90	.00
	Male	136	81.40	18.61			
Kinesthetic	Female	179	88.83	16.43	313	2.85	.00
	Male	136	83.42	17.04			

4.2.2. ESQ and Age Groups

To investigate potential differences in teachers' ESQ levels across age groups, a one-way analysis of variance (ANOVA) was conducted (Table 3). The results indicate significant differences in teachers' ESQ levels relative to their age groups ($F(4, 314) = 5.88, p = .00$).

Table 4*One-Way ANOVA for ESQ and Age Groups*

	Age	N	Mean	SD	df	F	Sig.
ESQ	20-30	53	494.15	108.50	4	5.88	.00
	30-40	79	518.82	82.69			
	40-50	128	535.01	80.37			
	50-60	50	472.90	66.54			
	Others	5	491.20	39.44			

Furthermore, the results of Bonferroni's pairwise comparison tests revealed differences in ESQ with respect to their age groups. The results for ESQ and age groups are presented in Table 4.

Table 4
Pairwise Comparisons of the Teachers' ESQ and Different Age Groups

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.
ESQ	20-30	30-40	-24.67	14.92	.99
		40-50	-40.86*	13.73	.03
		50-60	21.25	16.57	1.00
		Other	2.95	39.31	1.00
	30-40	20-30	24.67	14.92	.99
		40-50	-16.19	12.02	1.00
		50-60	45.92*	15.19	.03
		Other	27.62	38.75	1.00
	40-50	20-30	40.86*	13.73	.03
		30-40	16.19	12.02	1.00
		50-60	62.11*	14.02	.00
		Other	43.81	38.31	1.00
	50-60	20-30	-21.25	16.57	1.00
		30-40	-45.92*	15.19	.03
		40-50	-62.11*	14.02	.00
		Other	-18.30	39.42	1.00
	Other	20-30	-2.95	39.31	1.00
		30-40	-27.62	38.75	1.00
40-50		-43.81	38.31	1.00	
50-60		18.30	39.42	1.00	

*The mean difference is significant at the 0.05 level.

As Table 4 shows, ESQ in the age group of 40-50 is greater than the age groups of 20-30 and 50-60. ESQ for the age group of 30-40 is higher than that of 50-60.

5. Discussion

Recognizing the pivotal role of teachers' instructional quality in the progress of developing nations, especially within educational environments where adolescents are nurtured as future contributors to society, this study sought to investigate the level of emo-sensory intelligence among high school teachers. In pursuit of this objective, the research examined and analyzed the interrelationship between emo-sensory intelligence and two key variables: gender and age.

The outcomes revealed a noticeable disparity in emo-sensory intelligence between female and male teachers. In particular, female teachers seem to have a higher level of ESQ. This distinction may be linked to structural differences in the brains of men and women. Notably, studies propose that specific regions, such as the frontal and temporal areas of the cortex, crucial for visual processing and language storage, are comparatively larger in women than men (Zaidi, 2010). In fact, women appear to rely more on their senses. Additionally, differences in brain organization can be related to this diversity. Male brains frequently compartmentalize language in the left hemisphere and emotions in the right, which can lead to difficulties with expressing emotions.

Women, on the other hand, appear to use both hemispheres for emotional expression, boosting their ability to perceive and explain emotions effectively (Geary, 1998). Furthermore, gender variations in the limbic-thalamus-cortical area of the brain, which is responsible for emotion recognition and analysis, may contribute to these discrepancies (Xin et al., 2019). The outcomes of this study are similar to previous research by Naji Meidani et al. (2022), which suggests that women outperform males when it comes to applying their emo-sensory intelligence. Pishghadam et al. (2023) findings support this inclination, emphasizing that women are more likely to use written and verbal styles of emo-sensory

intelligence. Furthermore, the findings of Berrocal et al. (2012), who revealed that women have higher levels of emotional intelligence than men, support these tendencies.

An analysis of the relationship between age and emo-sensory intelligence reveals that individuals aged 40-50, followed by those aged 30-40, have higher levels of ESQ than other age groups. This tendency becomes more apparent in considering numerous studies indicating that individuals experience an increase in positive emotions as they enter adulthood, with this tendency reversing once they reach middle age (Dello Russo et al., 2020; Mroczek, 2001; Shallcross et al., 2012). As a result, teachers, like others, appear to improve in ESQ as they mature. The increase is due to an increase in positive emotions, which allows older people to distinguish and control emotions generated by their senses with greater maturity and tolerance. These findings are consistent with a recent study by Sharma (2017) and Chen et al. (2016), which found a link between advancing age and increased emotional intelligence in individuals.

Finally, while acknowledging the vital role of teachers' ESQ in encouraging effective interaction and successful teaching, this study emphasizes the influence of gender and age on this intelligence. Notably, female teachers and those in adulthood tend to demonstrate higher levels of emo-sensory intelligence than their counterparts. This heightened intelligence frequently translates into the more frequent utilization of teaching methods focused on senses and emotions. As a result, this cultivates an enhancement in students' emo-sensory intelligence, facilitating rapid and profound learning. It is crucial to raise awareness among teachers, especially males and those with less experience, about the pivotal role of emo-sensory intelligence in effective teaching.

Emo-sensory intelligence as a novel construct in psychology needs to be circulated to be attended to more by teachers, along with issues related to IQ and EQ. Emo-sensory intelligence seems to be related to experience and education. That is why enhancing literacy in this regard is of utmost importance. Conducting educational workshops and compiling practical scientific books can emerge as effective strategies to boost emo-sensory intelligence for implementing more impactful teaching methods. Therefore, ESQ literacy must be enhanced from the very beginning of life, especially at home and school. It seems that due to the novelty of the concept, teachers and parents need to be educated on how to monitor and manage ESQ in themselves and others.

Additionally, addressing concerns such as economic challenges, especially among male teachers, time constraints, and insufficient educational resources—factors that might undermine the significance of emo-sensory intelligence—should be a priority for education authorities. This study, focusing on gender and age, implies that future research could explore additional variables influencing emo-sensory intelligence. Investigating factors like teachers' experience levels, school environment type, and economic, social, cultural, and emo-sensory backgrounds could provide further insights. Moreover, qualitative studies, mainly through interviews, offer avenues to delve deeper into how teachers leverage emo-sensory intelligence to enhance student communication and refine teaching methods.

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Appendix

Sample Items of Emo-Sensory Intelligence Scale

Please read the items below and choose numbers 1 to 5 based on the instructions below:
 1= very little, 2 = little, 3 = average, 4 = much, 5 = very much

I know (can distinguish) sounds that make me feel ...	1	2	3	4	5	Example
1	sad					
2	surprised					
3	delighted					
4	disgusted					
5	enraged					
6	frightened					
Expressing my feelings toward sounds that are ...	1	2	3	4	5	Example
7	surprising is hard for me					
8	frightening is easy for me					
9	delighting is hard for me					
10	saddening is easy for me					
11	enraging is hard for me					
12	disgusting is easy for me					
I can control and monitor the sorts of sounds that have ... in the past.	1	2	3	4	5	Example
13	frightened me					
14	delighted me					
15	enraged me					
16	saddened me					
17	surprised me					
18	disgusted me					
Refraining from listening to sounds that ...	1	2	3	4	5	Example
19	sadden me is easy for me					
20	delight me is hard for me					
21	surprise me is possible for me					
22	enrage me is easy for me					
23	disgust me is hard for me					
24	frighten me is hard for me					

I know (can distinguish) images that make me feel ...	1	2	3	4	5	Example
1	sad					
2	surprised					
3	delighted					
4	disgusted					
5	enraged					
6	frightened					
Expressing my feelings toward images that are ...	1	2	3	4	5	Example
7	surprising is hard for me					
8	frightening is easy for me					
9	delighting is hard for me					
10	saddening is easy for me					
11	enraging is hard for me					
12	disgusting is easy for me					

I can control and monitor the sorts of images that have ... in the past.		1	2	3	4	5	Example
13	frightened me						
14	delighted me						
15	enraged me						
16	saddened me						
17	surprised me						
18	disgusted me						
Refraining from looking at things that ...		1	2	3	4	5	Example
19	sadden me is easy for me						
20	delight me is hard for me						
21	surprise me is possible for me						
22	enrage me is easy for me						
23	disgust me is hard for me						
24	frighten me is hard for me						