



RESEARCH ARTICLE

## The Effects of Emotional Intelligence-Oriented Psycho-Education Programme on Problem Solving and Decision-Making Skills

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### Abstract

The study's goal is to find out how emotional intelligence training affects adolescents' capacity for problem-solving and making choices. With a pretest-posttest control group, this study is an actual experimental design. 22 students who were enrolled in secondary school using this paradigm participated in the study. Nonparametric tests like Mann Whitney U and Wilcoxon Signed Ranks were deemed appropriate for data analysis because there were fewer than 30 students in each of the experimental and control groups. Problem-solving and decision-making abilities were employed in the experimental and control groups of the conducted pretest findings, which are initially used for emotional intelligence. According to the study's findings, there was a significant difference in the students in the experimental group's total scores for emotional intelligence ( $Z = -2.402$ ,  $p.05$ ), problem solving ( $Z = -2.845$ ,  $p.01$ ), and decision-making skills ( $Z = -2.580$ ,  $p.05$ ). It has been discovered that emotional intelligence is useful in the improvement of decision-making abilities. The results of the study showed that there was a significant difference in the emotional quotient of the pupils in the experimental group ( $p.01$ ). Additionally, a statistically significant difference in favor of the experimental group was discovered for both problem-solving and decision-making abilities ( $p .01$ ). These results were talked about and understood.

### Keywords

Emotional Intelligence, Problem- Solving, Decision-Making

## INTRODUCTION

The concept of emotion has been the subject of many researches throughout history; accordingly, various definitions have been established (Frijda, 2000). In some of these studies, certain emotions are the result of psychological situations experienced by individuals in the face of events due to their own thoughts (White, 2010); emotions are a wide variety of experiences experienced as a reaction to internal or external stimuli (Datler, 2013); emotions are the forces that prepare and motivate the individual to take action (Frijda, 2000); psychological and biological states and a series of movement tendencies (Goleman, 2007) and the

individual's response to relationships (Mayer, 2001) is defined as an emotional reaction.

Emotions are the basis for an individual to exhibit the necessary harmony for gaining life skills (Ekman & Davidson, 1994). These feelings are biological processes that develop suddenly and uncontrollably (Benson, at all, 2012). The beginning point of emotions is the nervous system, and based on this, it reveals the underlying brain mechanisms (Le Doux, 2006). The connections between the amygdala and the neocortex, which are part of the limbic system in the nervous system and have a primary role in the formation of emotional memory and reactions, are the main center of the mind, heart, emotion,

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thought and behavior, so it can be said that emotions are present even in the background of superior decisions (Goleman, 2011). When the human brain receives any signs, it tends to react to fear, suspicion, astonishment, joy and relaxation (Le Doux, 2006). Although emotions are common to all people, their use may vary according to individuals (Petrides & Furnham, 2003). Emotions also occur differently in each person. At the same time, humans possess intelligence in the context of emotional thought.

Emotional intelligence first emerged as a product of multiple intelligence thinking. Gardner, the pioneer of multiple intelligence theory, has described intelligence as the ability to use problem-solving skills as a cultural product (Gardner & Hatch, 1990). "Mayer, DiPaolo, and Salovey (1990) were the first to use the term 'emotional intelligence' to describe the difference in individuals' emotional understanding and interpretation." Solving problems and making wise decisions using both thoughts and feelings or logic and intuition is part of emotional intelligence (Mayer & Salovey, 1997; Salovey & Mayer, 1990). Emotional intelligence is the ability to perceive and make sense of emotions, to regulate emotions (Mayer & Salovey, 1997), non-cognitive capacity and coping competence affecting external processes (Bar-On, 2005), self-control, self-motivation, determination and the ability to demonstrate patience (Goleman, 1995), to recognize and then differentiate oneself and others' emotions, and then use it as a guide (Salovey & Mayer, 1990). Emotional intelligence also involves recognizing and evaluating our own and others' emotions as well as information about emotions and emotions in our daily lives and work effectively to reflect the energy allowing us to respond appropriately (Yeşilyaprak, 2001). These reactions affect people's ability to solve problems. Skills are learned from childhood and developed during school years (Miller & Nunn, 2001). It is stated that individuals who solve problems effectively are independent and creative thinkers who are socially competent, confident and able to tolerate uncertainty (Dow & Mayer, 2004). Problem-solving contributes to an individual's knowledge, skills and behavior (Exley & Dennick, 2004). In problem solving, the individual re-organizes and uses previously acquired concepts and skills to solve problems encountered (Ünsal & Ergin, 2011). The ability to solve problems involves the use of cognitive abilities to make decisions and

make the most appropriate decisions (Agran, et. al., 2002).

Some researchers argue that problem-solving and decision-making processes are similar and, therefore, that these concepts should be used together (Adair, 2000; Churney, 2001; Kushniruk, 2000). Today, the concept of problem solving is expressed as an element of cognition that is intertwined with terms such as thinking, decision making and judgment (Green & Gilhooly, 2012). Decision-making is the process of thinking through alternatives (Welton & Mallan, 1999). According to another view, the concepts of problem-solving and decision-making are different from each other (Elstein & Schwarz, 2002; Isen, 2001). Making decisions is generally defined as choosing among alternatives (Connor & Becker, 2003; Rollinson, 2002), and it is stated that if there is only one option to choose, decision-making cannot be utilized (Rollinson, 2002). In addition to being the most common type of problem we face in our daily and professional lives, decision making represents the basic processes for solving more complex and poorly structured problems (Means, et.al, 1993). In other words, decision making involves selecting one or more useful or satisfying options from a wider set of options. These options may include requirements, strategies, events, forecasts and opportunities. However, the decision always requires adherence to an action process that aims to give satisfactory results to an individual (Yates, 2003). Although there is extensive literature on decision analysis and decision-making processes, little attention has been paid to teaching students how to make effective decisions (Jonassen, 2012). In their study that was conducted for adolescents, Borders (2009) used a teaching technique to divulge the necessary decision-making skills for adolescents to reach constructive goals.

When the literature is examined, it is seen that there are studies examining the relationship between emotional awareness and expressing emotions and family education level and gender variables (Schilling, 1996; Harrod & Scheer, 2005). On the other hand, it was noted that the studies conducted on adolescents frequently cover the secondary education level. Considering that adolescence starts in the middle school years and the most intense stages occur during these years, there is a need for studies to be carried out in this stage. Developing these skills is considered to be

significant when it comes to the effectiveness of the decisions taken during adolescence and the problem-solving skills used throughout the life of the individual. This study aimed to investigate the effect of psycho-education programs on developing the emotional intelligence on problem solving and decision-making skills of secondary school students. For the following reasons, it is predicted that a significant improvement in the problem-solving and decision-making skills of participants will be observed.

There is no significant difference between the pretest scores of the experimental and control groups pertaining to the problem-solving and decision-making skills of secondary school students. There will be a significant improvement in the problem-solving and decision-making skills of the secondary school students who were administered the psycho-education program to improve emotional intelligence compared to the subjects in the control group, and this improvement will continue in the monitoring measurement of 45 days after the completion of the applications.

## MATERIALS AND METHODS

### *Study Design*

This experimental study aimed to determine the effect of psycho-education programs on the problem solving and decision-making skills of secondary school students. In the research, a real experimental design with a 2x3 factor mixed (split-plot) pretest and posttest control group defined as two-factor mixed design (Büyüköztürk, 2002/2007; Plano, Clark & Creswell, 2015) was employed. In this design, the first factor shows independent process groups (experiment, control), while the other factor includes pretest, posttest and monitoring measurements of the dependent variable.

This study was approved by Usak University Social Sciences and Humanities Scientific Research and Publication Ethics Committee (16/02/2023, Decision No: 2023-28-29-32) and written informed consent was obtained from the participants before starting the study.

### *Study Group*

In this study, the sample age group was first specified by taking the need in the literature and the competence of the practitioner into consideration, so it was decided that the sample group should be secondary school students. The study was

conducted with students studying at a secondary school in Usak during the 2017-2018 academic year. The Emotional Intelligence Scale (EIS), Problem Solving Scale (PSI) and Decision-Making Scale (DCS) were used to select the participants in the experimental and control groups. As a result of the counseling, interviews and scales administered by the school counselor, 11 secondary school students were included in the experimental group. 11 students were selected from the other middle school students in the same school via random selection forming a control group. The age range of the students in the research group varies between 12 and 13. Measurement tools were applied as part of the pretest before the application and as posttest at the end of the application. Monitoring scaling was performed 45 days after the completion of the applications.

### *Development of Psycho-education Program for Developing Emotional Intelligence*

In this study, a 10-session psycho-training program was developed based on the literature and applied to 11 experimental groups (6 girls and 5 boys). No application was made to the control group. An interview was held with the school counselor who was planned to perform the practice and the subject that the students needed the most was determined as the subject of the psycho-education program, and as a result, the Taba-Tyler model was adopted and program development studies were carried out in eight stages. These stages include: a) identification of needs, b) identification of objectives, c) selection of content, d) arrangement of content, e) selection of learning experiences, f) regulation of learning activities, g) determination of what to evaluate and h) sequence of program elements and control of relationships (Oliva, 1988). While developing the program, Erkan's (2002) "Sample Group Guidance Activities" book, Reuven Bar-On's Emotional Intelligence Model (Bar-On), Köksal's (2007) thesis "Development of a program to develop emotional intelligence in wunderkinds" and the Ministry of National Education (MEB, 2007) Primary and Secondary Education Institutions Class Guidance Program Secondary Education Activities book were benefited from. Besides, before applying this program to the experimental group, the opinions of three experts with a doctoral qualification in the field of

psychological counseling were consulted and the program was prepared accordingly.

This program was implemented in the group counseling center of a secondary school in Uşak during the 2018-2019 academic year after obtaining the necessary permission from the school administration and parents. The psycho-education program was held on Tuesdays every week after the end of the school classes. A total of ten sessions took place, each session lasting approximately 45 minutes.

This program is designed to increase the emotional intelligence of middle school students in general. However, the steps that have been determined to help express emotions, improve their expressive skills and increase their psychological and personal well-being are as follows: a) having knowledge about emotions, b) expressing emotions in a concrete way, c) establishing emotion-sensory relationships, d) awareness of the relationship between emotion and bodily reaction, e) awareness of positive and negative emotions, f) ability to express their emotions using I language g) awareness of others' emotions, h) understanding of emotional intelligence levels and i) solving personal problems by developing decision-making skills.

In these sessions, after meeting in a group, the students were asked what they knew about emotions. After each student shared their answer in turn, a common emotion definition was made based on information that the students shared and brief information was provided by the group leader. Emotion and emotional intelligence were defined. Between sessions, students were assigned homework "The Child that make Friends with his/her Feelings / Dr. Lauren Rubenstein" and their feelings or which page they were on were evaluated. Activities were conducted to improve the problem solving and decision making-skills of their emotional intelligence. A psychodrama game was conducted in order to enable students to confront their emotions after playing a role to improve problem-solving and decision-making skills.

In the last two sessions, a study of the effects of the program aimed at increasing emotional intelligence as well as applications to improve problem-solving and decision-making skills were conducted. In the last session, a "gossip" activity was held for the students to reflect upon the beginning and current changes. In addition, considering the age and developmental characteristics of the participants, role-playing and

exercises were used to facilitated group communication.

#### ***Data Collecting Tools***

##### ***Bar-On Emotional Intelligence Test Child and Adolescent Short Form***

Within the frame of the research, "Bar-On Emotional Intelligence Test Child and Adolescent Short Form," originally developed by Bar-On (2006) and adapted to Turkish by Karabulut (2012), was used to determine the emotional intelligence levels of the students. The scale consists of 25 items consisting of 4-point Linkert-type scale. The internal consistency coefficients of the scale adapted for the 4th and 5th grade students vary between .69 and .83 (Karabulut, 2012). In this research, the Cronbach alpha internal consistency coefficient of the whole scale was calculated to be .73.

##### ***Problem Solving Inventory***

In the context of the research as a data collection tool, the original version was developed by Heppner and Petersen (1982) in order to measure students' perceptions of problem-solving skills. Its Turkish adaptation study conducted by Şahin, et.al. (1993) "Problem Solving Inventory" was used. The scale employed by Kardaş, Anagün and Yalçınoğlu was adapted for use with primary school students in 2014. The scale consists of a total of 35 items of Likert-type scored between 1 and 6. The results of the confirmatory factor analysis revealed that the Turkish version of the inventory, which was originally composed of three factors and 32 items, was composed of 20 items and the original inventory was composed of three sub-factors (Kardaş, et.al., 2014). The internal consistency coefficient of the adapted scale was found to be .83 (Şahin et al., 1993). In this study, the Cronbach alpha internal consistency coefficient of the whole scale was calculated to be .89.

##### ***Decision Making Scale in Adolescents***

In the scope of the research as the third data collection tool, the original version was developed by Mann, et.al. (1989) for the purpose of determining the decision-making styles of adolescents in the 13 to 15 age group, and the adaptation study to Turkish was conducted by Çolakkadioğlu and Güçray (2007) in which the "Adolescent Decision-Making Scale" was employed. The scale consists of 25 items consisting of 4 Likert-type items. The internal consistency coefficients of the adapted scale

ranged between .65 and .79 (Çolakkadioğlu&Güçray, 2007). In this study, the Cronbach alpha internal consistency coefficient of the whole scale was calculated to be .80.

**Analysis of the Data**

The data were evaluated statistically using the SPSS (Statistical Package for the Social Sciences) 24.0 package program. Since there were 30 participants in this study, non-parametric tests were employed. It is important to understand the prerequisites for doing hypothesis testing and if the data meet them. Non-parametric tests applied to the data will produce more accurate findings if it cannot be determined whether the conditions are met (Kalaycı, 2010). Because the respondents were under 30, it was decided to carry out a nonparametric analysis. In experimental research

when the normality assumption of score distributions cannot be Since the study sample consisted of a total of 22 students in the experimental and control groups, a normal distribution is not expected, so it was considered appropriate to use non-parametric tests for the present study. In the study, the meaningfulness level was accepted as .05 and .01.

**RESULTS**

The Mann-Whitney U test was used to determine whether there is a significant difference between the pretest total scores for emotional intelligence, and problem-solving and decision-making skills of middle school students in the experimental and control groups, and the data obtained are given in Table1.

**Table 1.** Mann-Whitney U test results related to scale total scores and pretest scores of experiments and control groups.

Scale	Groups	N	Rank Average	Rank Total	U	p
Emotional Intelligence	Experiment	11	9.18	101.00	35.00	.093
	Control	11	13.82	152.00		
Problem Solving	Experiment	11	13.45	148.00	39.00	.158
	Control	11	9.55	105.00		
Decision Making	Experiment	11	12.23	134.50	52.50	.597
	Control	11	10.77	118.50		

p>.05

As seen in Table 1, there was no significant difference between the total scores of emotional intelligences, problem-solving and decision-making skills of the students in the experimental and control groups. This finding shows that the students in the experimental and control groups are close to each other in terms of emotional intelligence, and problem- solving and decision-

making skills.

The Wilcoxon signed-rank test was used to test the difference between the scores obtained from the pretest and posttest measurements of the total scores of emotional intelligence, problem-solving and decision-making skills of the students in the experimental group, and the results obtained are presented in Table 2.

**Table 2:** Wilcoxon signed-rank test analysis results related to scale total scores and pretest and posttest scores of the experiment group students.

Groups	Pretest-Posttest	N	RankAverages	RankTotal	Z	p
Emotional IntelligencePretest	NegativeRank	3	2	6.00	-2.402	.016*
EmotionalIntelligencePosttest	Positive Rank	8	7.5	60.00		
	Equal	0				
Problem SolvingPretest	NegativeRank	10	1.00	1.00	-2.845	.004**
Problem Solving Posttest	Positive Rank	1	6.50	65.00		
	Equal	0				
Decision MakingPretest	NegativeRank	10	4.00	4.00	-2.580	.010*
Decision MakingPosttest	Positive Rank	1	6.20	62.00		
	Equal	0				

\*\*p<.01, \*p<.05

As shown in Table 2, the total difference among emotional intelligence [ $Z = -2.402, p < .05$ ], problem-solving [ $Z = -2.845, p < .01$ ] and decision-making skills of students in the experimental group [ $Z = -2.580, p < .05$ ], was found to be significant. This finding shows that the posttest scores of the students in the experimental group differ significantly from their pretest scores. Based on this finding, it can be said that the 10-session psycho-education program aimed at increasing

emotional intelligence had a positive effect on the students' emotional intelligence, and problem-solving and decision-making skills. The Wilcoxon signed-rank test was used to test the difference between the scores obtained from the pretest and posttest in the total scores for emotional intelligence, problem-solving and decision-making skills of the students in the control group, and the results obtained are presented in Table 3.

**Table 3:** Wilcoxon signed rank test analysis results related to scale total scores and pretest-posttest scores of the students in the research group.

Groups	Pretest-Posttest	N	Rank Averages	Rank Total	Z	p
Emotional IntelligencePretest	Negative Rank	0	.00	.00	- 1.000	.317
Emotional IntelligencePosttest	Positive Rank	1	1.00	1,00		
	Equal	10				
Problem SolvingPretest	Negative Rank	5	6.40	32.00	-.089	.929
Problem Solving Posttest	Positive Rank	6	5.67	34.00		
	Equal	0				
Decision MakingPretest	Negative Rank	1	4.50	4.50	- 1.902	.057
Decision MakingPosttest	Positive Rank	7	4.50	31.50		
	Equal	3				

>.05

Table 3 shows the total scores for emotional intelligence [ $Z = -1.000, p > .05$ ], problem-solving [ $Z = -.089, p > .05$ ] and decision-making skills of students in the control group [ $Z = -1.902, p > .05$ ]. This finding shows that the pretest and posttest scores of the control group did not differ significantly. In the basis of this finding, it can be said that time and other environmental factors have no effect on emotional intelligence

problem-solving and decision-making skills of the students in the control group. The Mann-Whitney U test was used to determine whether there is a significant difference between the total scores for emotional intelligence, and problem-solving and decision-making skills of middle school students in the experimental and control groups and the data acquired are presented in Table 4.

**Table 4:** Mann-Whitney U test results related to scale total scores and post test scores of experiments and control groups.

Scale	Groups	N	RankAverage	RankTotal	U	p
Emotional Intelligence	Experiment	11	16.23	178.50	8.50	.001**
	Control	11	6.77	74.50		
Problem Solving	Experiment	11	14.41	158.00	28.5	.035*
	Control	11	8.59	94.00		
Decision Making	Experiment	11	15.09	166.00	21.0	.009**
	Control	11	7.91	87.00		

\*\*p<.01, \*p<.05

As seen in Table 4, the difference in the total scores of emotional intelligences, problem-solving and decision-making skills of the students in the experimental and control groups was found to be significant. This finding shows that the posttest scores of the students in the experimental group differ significantly from the students in the control group. From this point of view for the finding, it can be said that the 10-session psycho-education.

## DISCUSSION

During the course of this study, the effect of the psycho-education program on the problem-solving and decision-making skills of the secondary school students in the development of emotional intelligence was examined. In addition, it was observed that the posttest scores of the students in the experimental group differed significantly from their pretest scores, but no significant difference was found between the pretest and posttest scores of the control group students. While this finding shows that the students in the experimental and control groups were initially close to each other in terms of emotional intelligence, problem-solving and decision-making skills, the posttest results after the application of the emotional intelligence development-oriented psycho-education program to the students in the experimental group were compared. It was found to be effective in the development of applying skills. The results of the study support the findings of the study on emotional intelligence education conducted with 52 ninth-grade students (Tufan, 2011). Similarly, another study conducted with 68 university students support the results of the present study (Shao, et al., 2013). The findings of the study conducted by Di Fabio and Kenny (2012), which examined the relationship between emotional intelligence skills and decision-making styles, are in parallel with the present study.

Emotional intelligence as a type of intelligence (Gardner, 1993; Sternberg, 1988) is the body's responses to a specific stimulus, and the ability to regulate these responses can be increased by variation according to the individual (Gross, 1998; Gross & Thompson, 2007). The individual's emotional skills emerge from birth and develop rapidly in early childhood (Denham, et.al., 2003). While basic emotions such as happiness, sadness and anger are seen from infancy, it is seen that more complex emotions, such as guilt and regret, emerge in later ages (Çelik, et.al., 2002). This emotional development involves the child's ability to recognize his or her emotions, to regulate and control his or her emotions and to establish emotion by transferring them to different situations (Bar-On, 2006). Therefore, besides the biological basis of emotional intelligence, it can be said that it is also effective in terms of social development (Denham, 1998). Sociobiologists argue that

emotions adapt to life by asserting that feelings of anger protect us from the aggression of others, that pleasure and happiness drive individuals to approach each other and continue their species and that the crying behavior of the individual in sorrow and grief seeks assistance from others (Cüceloğlu, 1991). Similarly, Ekman (1992) stated that emotions are a source of motivation for quality of life and that it helps the individual to adapt to nature and society by increasing their probability of survival.

Emotions also have a significant role in terms of determining the direction of human behavior towards objects, ideas and others, protecting the values of the individual in certain situations and coping with the obstacles encountered by the individual (Schilling, 1996).

When emotions increase in a situation that is important for the individual or as a result of changes in their relations with others (Lazarus, 1994), it can be said that they carry meaningful messages for communication and interaction (Schwarz & Clore, 1983).

Goleman stated that individuals with a high level of emotional intelligence do not resist obstacles, control their impulses and are full of hope and empathy (Stubbs & Wolff, 2008). Schilling (1996) said that these individuals were able to take in, process and evaluate information in nature and turn them into emotional behavior. Similarly, Yeşilyaprak (2001) stated that individuals can use emotional intelligence in order to recognize and evaluate their own and others' emotions and reflect their knowledge and energy effectively in daily life and describe people who use their emotions effectively to achieve their goals. The concept of emotional intelligence, which has become increasingly common from the past to the present, has shown that people are not a biological machine (Suliman & Al-Shaikh, 2007), and as a result employers have directed their employees to various emotional intelligence development courses (Wong & Law, 2002). The emotional skills of children who grew up without communicating with people face-to-face in front of the television and computer did not improve, and this result increased the need for educational programs to strengthen their emotional intelligence (Yaşarsoy, 2006).

Because emotions emerge and are developed at an early age, it is thought that emotional awareness and empathy training starting from the

pre-school period and on will be effective in structuring individuals with drama according to the developmental period. The learning environment and the role of the teacher are of great importance in the acquisition of these skills. For this reason, teachers should possess enough information about emotional intelligence and be able to organize an environment that is conducive to improvement. It is thought that conducting in-service training or teaching emotional literacy courses as elective courses in the faculty of education will be effective for improving awareness of emotional intelligence among teachers. In addition, it is thought that this training will be provided by school psychological counselors as a consultation service to other teachers and families within the scope of preventive and developmental guidance to students and will contribute to the development of students at the cognitive and social levels.

A high level of emotional intelligence, which is effective for decision-making and problem-solving, encourages students to communicate more effectively and will contribute to the development of positive learning environments. It is believed that various studies and training programs will contribute to the field.

### Conclusion

For raising the effectiveness of psycho-education programs, which are directed towards the development of emotional intelligence, administering this program to students of different ages and levels of education may be suggested. While preparing the psycho-education program, activities based on humanitarian theory were used. In a new group study, different approaches such as behavioral theory and cognitive theory may be preferred. In addition, a monitoring test was performed 45 days following the psycho-education application. Multiple monitoring tests can be performed at different intervals to test the effectiveness of the study. In addition to the psycho-education program to develop emotional intelligence to increase problem-solving and decision-making skills, individual sessions can also be held with the participants. Finally, experts working in the field of psychological counseling can adapt this program to the needs of their students and institutions. Furthermore, studies can be conducted with larger groups in order to increase the problem-solving and decision-making skills of the students in educational institutions at the secondary level.

### Conflict of Interests Statement

There are no conflicts of interest for the contributing author.

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### Ethics Statement

The study protocol was approved by Usak University Social Sciences and Humanities Scientific Research and Publication Ethics Committee (16/02/2023, Decision No: 2023-28-29-32) and written informed consent was obtained from the participants before starting the study.

### Author Contributions

Planned by the author: Study Design, Data Collection, Statistical Analysis, Data Interpretation, Manuscript Preparation, Literature Search. Author have read and agreed to the published version of the manuscript.

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