

Full Length Research Paper

The relationship between emotional intelligence and problem solving skills in prospective teachers

Sabahattin Deniz

Mugla Sıtkı Kocman University, Educational Faculty, Department of Educational Sciences, Mugla, Turkey.

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This study aims to investigate the relationship between emotional intelligence and problem solving. The sample set of the research was taken from the Faculty of Education of Mugla University by the random sampling method. The participants were 386 students -prospective teachers- (224 females; 182 males) who took part in the study voluntarily. Emotional intelligence levels and problem solving skills of prospective teachers were measured using the Bar-On Emotional Quotient Inventory (Bar-On, 1997) and Problem-Solving Inventory, respectively. Pearson product-moment correlation analysis and structural equation modeling were employed to analyze data. Emotional intelligence was found to be significantly correlated with problem solving.

Key words: Emotional intelligence; problem solving; prospective teachers, teacher training, structural equation modeling.

INTRODUCTION

The close relationship between emotion and cognitive processes such as learning, decision making and memory is known well from the studies conducted in the field of experimental psychology throughout its history. In recent years, some experimental evidence indicates that these cognitive processes can be impaired if the areas of the brain responsible for emotions are damaged (Damasio, 1994); hence, it can be argued that emotion is one of the components of intelligence (Goleman, 1995).

When the literature is reviewed, it is seen that there are different ways of operationalizing emotional intelligence. Actually, it is generally agreed that if not properly conceptualized and explained, the term "emotional intelligence" may lead to some confusions (Mayer et al., 2008). When its early conceptualizations are examined, it is seen that emotional intelligence focused on understanding one's own and/or others' emotional experience (Salovey and Mayer, 1990). Over time, the concept of emotional intelligence gained more popularity

in the field, and many theorists and researchers started to incorporate personality traits and competencies into the definition of emotional intelligence as its inherent part. Assertiveness, persistence, adaptability and impulsivity can be given as some examples of these personality traits and competencies (Bar-On, 1997; Goleman, 1995; Petrides and Furnham, 2003). Moreover, by its definition, emotional intelligence should be distinguished from other intelligence and competence types (Mayer et al., 2008) such as social intelligence, personal intelligence, cultural intelligence, social competence, social effectiveness, emotional competence, and interpersonal competence. However, these terms seem to be used interchangeably in the literature. Emotional intelligence connects the fields of emotions and intelligence to each other by viewing emotions as useful sources of information that help people to understand and find their ways in the social environment. Salovey and Mayer (1990) defined emotional intelligence as "The ability to monitor one's

own and others' feelings, to discriminate among them, and to use this information to guide one's thinking and action". Then, this definition was divided into four related abilities which are perceiving, using, understanding, and managing emotions. People with emotional intelligence know how to control and manage their emotions (Mayer and Salovey, 1997).

According to Goleman (1998), there are five components making up emotional intelligence; hence, emotional intelligence is a multidimensional construct. These five components are self-awareness, self-regulation, motivation, empathy, and social skills. The competencies required by these components are as follows: Self-awareness is related to emotional awareness, accurate self-assessment and self-confidence; Self-regulation is related to self-control, trustworthiness, conscientiousness, adaptability, and innovation; Motivation is related to achievement drive, commitment, initiative and optimism; Empathy is related to understanding and developing others, service orientation and nurturing diversity; Social skills are related to influence, communication, conflict management, leadership, change catalyst, building bonds, collaboration and cooperation, and team capabilities. A new model of emotional intelligence was proposed by Bar-On (2005). This model offers a theoretical model for the EQ-I developed to evaluate different aspects of emotional intelligence and its conceptualization. According to this model, effectiveness of our understanding and expressing ourselves, understanding others and relating with them and coping with the requirements of daily life is determined by emotional and social competencies, skills, and factors enclosed by emotional-social intelligence. Bar-On (2005) states that this model of emotional and social intelligence shares many common points with the former models possessing one or more of the following components: (a) the ability to recognize, understand, and express emotions and feelings; (b) the ability to understand how others feel and relate with them; (c) the ability to manage and control emotion; (d) the ability to manage change, adapt, and solve problems of a personal and interpersonal nature and the ability to generate positive effects and be self-motivated.

According to Baron's model, for a person to possess emotional and social intelligence, he/she needs to understand and express himself/herself, relates well with others, and knows how to handle the problems and pressures of daily life. When intrapersonal level is considered, this requires the person to be aware of himself/herself, to understand his/her strengths and weaknesses and to express his/her feelings and thoughts without giving harm. On the intrapersonal level on the other hand, having emotional and social intelligence requires the ability to be aware of the emotions, feelings and needs of others to create and maintain cooperative,

constructive and mutually satisfying relationships. As a result, if you can effectively manage personal, social and environmental changes by dealing with immediate situations, finding solutions to problems and making decisions, it means you are emotionally and socially intelligent.

According to D'Zurilla and Goldfried (1971), problem can be defined as any situation in daily life to be responded for adaptive and effective functioning. A situation can be defined as a problem for a person when he/she feels disturbed by it and when the problem hinders the person from achieving his/her goal (D'Zurilla and Nezu, 1982). In such situations, if you can solve the problem, you can cope with the obstacles. Problem solving serves the function of enhancing the situation and reducing the emotional distress caused by it (D'Zurilla et al., 2004). D'Zurilla et al. proposed a problem solving assessment in their social-problem solving theory (D'Zurilla and Nezu, 1982, 1990; D'Zurilla et al., 2002) as a generalized set of beliefs or expectancies about one's problem-solving abilities. And according to them, problem solving involves self-directed cognitive and behavioral processes through which adaptive ways of tackling problematic situations can be identified or discovered by a person. However, they argue that the term social does not mean administration of problem solving to any particular type of problem rather it means focusing on problem solving influencing a person's ability to adapt to real-life environment.

D'Zurilla and Goldfried (1971) proposed a social problem solving model and most of the research conducted on problem solving is based on this model. This model was then expanded and improved by D'Zurilla and Nezu (1982), and revised by D'Zurilla et al. (2002). This model claims that there are two general but partially independent processes that are problem orientation and problem-solving style determining the outcomes of problem solving in the real world (Maydeu-Olivares and D'Zurilla, 1996). Problem orientation involves a metacognitive process and this process relates the general beliefs, appraisals of feelings of people about problems encountered in their life and their own problem-solving ability (D'Zurilla et al., 2004).

There are two sub-dimensions making up problem orientation that are positive and negative problem orientation. The main characteristics of positive problem orientation are appraising a problem as a challenge, belief in the solvability of problems, having confidence in one's problem solving ability, believing that problem solving takes time, effort and persistence and commitment to problem solving.

On the contrary, the main characteristics of negative problem orientation are regarding a problem as a significant threat to one's wellbeing, thinking that problems cannot be solved, lack of self-efficacy in problem solving and feeling depressed when problems

are encountered (D'Zurilla and Chang, 1995; D'Zurilla et al., 2002; Maydeu-Olivares and D'Zurilla, 1996).

Rational problem solving, impulsivity and avoidance are the three dimensions of the style used to solve problems. If a person can apply effective problem solving skills, then he/she can be claimed to own the rational problem-solving style (D'Zurilla et al., 2004).

The impulsivity style involves employing problem solving skills impulsively and hurriedly without taking much care (Belzer et al., 2002). The last one is avoidance style which leads to functioning improperly and its main components are procrastination, passivity or inaction, and dependency (D'Zurilla et al., 2002). If a person can solve the problems effectively, then he/she can reduce psychological stress and negative emotional states because effective problem solving enables people to cope with their daily problems and their affective influences more effectively (McCabe, Blankstein, & Mills, 1999).

To be able to lead a decent life, people should know how to cope with problems because they are the inevitable part of one's life and often source of stress which requires a response. Not only the magnitude of the problem but also individual characteristics such as personality, biology, life experience and coping styles, including effective problem solving determine how severe this response will be. Despite the fact that personality and biology can be partially pre-determined and experiences cannot be forgotten, there are a lot of things to be done in terms of coping behaviors and problem-solving skills so that the severity of the stress response can be reduced. Research conducted within the last two decades revealed how coping and problem-solving skills are important in dealing with chronic problems, stressful events in life and difficulties experienced in adjustment processes (Heppner et al., 2002).

University life is a completely new life for many students; hence, a student may have many problems to cope with during this period. Particularly the initial years of this period are highly stressful because students are away from their home and support systems and they have to adapt to a completely new environment which poses many social and intellectual challenges (McCabe et al., 1999). Students may deal with their problems more easily if they can use their emotional intelligence and employ rational and appropriate approaches and this also holds true for pre-service teachers. If they can do this, they increase their change of becoming successful in their education and daily life.

Determining how to predict problem solving skills through emotional intelligence can yield very useful suggestions for the future direction of problem solving skills programs and advice given by universities. Therefore, the current study aims to determine whether or not emotional intelligence is a significant predictor of problem solving ability.

METHODOLOGY

Participants

The study was a descriptive and correlational method was used. The sample set of the research was taken from the Faculty of Education of Mugla University by the random sampling method. Random sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher, the sampling group selected easy access (Yıldırım and Simsek, 2004: 82). The participants were 386 students -prospective teachers- (224 females; 182 males) who took part in the study voluntarily. The mean age of the participants was 23.00 years, with a standard deviation of 1.70 years.

Instruments

Bar-on emotional quotient inventory (EQ-I)

The EQ-I developed by Bar-On (1997) adapted to Turkish by Acar (2001) was used for emotional intelligence measurement. The original EQ-I form is a 133-item self-report inventory. Items are declarative statements phrased in the first-person singular. Respondents are asked to indicate the degree to which the statement accurately describes them on a 5-point scale (1=not true of me, 5=true of me). Items are summed to yield a total score, which reflects overall emotional intelligence; scores on 5 higher-order composite dimensions. The EQ-I scores are related to general psychosocial adjustment (Dawda and Hart, 2000). The Turkish form of the EQ-I is an 88-item measure that provides an overall score of EQ-I based on five composite scales. Cronbach Alpha coefficients were .92 for overall score, and .83 for intrapersonal intelligence, .77 for interpersonal intelligence, .65 for adaptability, .73 for stress management, and .75 for general mood (Acar, 2001).

Problem-solving inventory (PSI)

Heppner et al. (1993) provide a measure of the problem solving process. It assesses how individuals generally deal with problem situations. This 35 item scale has a 6 point Likert response format. Six subscales can be derived from subjects' responses: impetuous approach, thinking approach, avoiding approach, evaluating approach, self-confident approach, and planned approach. Cronbach Alpha coefficients were .78 for impetuous approach, .76 for thinking approach, .74 for avoiding approach, .69 for evaluating approach, .69 for self-confident approach, and .76 for planned approach. A higher score reflects poorer perceived problem solving ability.

Analysis

Structural equation modeling (SEM) was used to test the multiple relationships in the study. This confirmatory factor analysis technique is used to estimate, analyze and test models that specify relationships among variables (Bruce, 2003, Cited in Seker, 2011:241-261). In SEM, if the model suggested is not in compliance with the data, the researcher redesigns the model and retests it by using the same data. For this reason, SEM studies are corrective and explanatory (Kline, 2005). In this study, the model was created by testing the relationships among the emotional intelligence and problem solving variables using SEM.

Table 1. The relationship between emotional intelligence and problem solving skills.

Variable	Impetuous approach	thinking approach	avoiding approach	evaluating approach	self-conf. approach	planned approach
Intrapersonal	-.24*	.47**	-.16*	.38**	.40**	.36**
Adaptability	-.22*	.49**	-.19*	.43**	.41**	.37**
Stress Man.	-.34**	.44**	-.30**	.48**	.46**	.46**
Gen. Mood	-.21*	.38**	-.17*	.36**	.39**	.34**
Interpersonal	-.29**	.45**	-.33**	.47**	.45**	.41**

RESULTS

An analysis of the relationship between emotional intelligence and problem solving of prospective teachers was performed using Pearson Product-Moment Correlation analysis and Structural Equation Modeling. Results are presented in Table 1.

Although there are a negative relationship between some dimensions of problem solving (impetuous approach and avoiding approach) and emotional intelligence, sub dimensions of problem solving (thinking approach, evaluating approach, self-confident approach, and planned approach) are positively related to sub dimensions of emotional intelligence (intrapersonal, interpersonal, stress management, adaptability, and general mood).

There are many studies showing that there is a positive correlation between emotional intelligence and problem solving skills (Guler, 2006; Goleman, 2005; Cooper and Sawaf, 2000). The individuals who can recognize and control their emotions can exhibit more positive approaches to the problems and accordingly can solve them more easily (Guler, 2006). According to Perek (2004), the individuals who cannot use their emotional intelligence effectively cannot communicate effectively and cannot control their emotions when crisis and situations such as conflicts, stress etc. are encountered (cited in Guler, 2006:106). Table 1 shows that though there is a positive correlation between emotional intelligence and problem solving skills, there is a negative correlation between the sub-dimensions of problem solving; impetuous approach and avoiding approach, and emotional intelligence. In impetuous problem solving approach, the individual usually follows the route first coming to his/her mind when a problem situation is confronted with, and overlooks other alternatives. On the other hand, within the framework of avoiding approach, the individual is thought to have not collected detailed information about the problem at hand, to avoid problem solving behaviour when failure is experienced, and to be not certain about what benefit can be obtained when the problem is solved. Therefore, the correlation between these two dimensions (impetuous approach and avoiding

approach) and emotional intelligence is expected to be negative. Yet, according to Table 1, there is a positive correlation between the other dimensions of problem solving (thinking approach, evaluating approach, self-confidence approach and planned approach) and emotional intelligence.

According to the data obtained the total points of emotional intelligence predict the subdimensions of emotional intelligence between .57 and .69 . The total points of problem-solving predict the subdimensions of problem-solving between .44 and .67. Moreover there is a relationship of .49 between the total points of emotional intelligence and problem solving. Figure 1 shows whether the variables are consistent or not. As can be seen in the Figure, the data obtained fit well model. Path coefficients ranged from 0.44 to 0.69. Path coefficients with absolute values less than 0.10 could indicate a 'small' effect, values around 0.30 could suggest a 'typical' or 'medium' effect, and a 'large effect' could be indicated by coefficients with absolute values ≥ 0.50 (Kline, 2005). In this study, all of these values were higher than 0.30

DISCUSSION CONCLUSIONS AND LIMITATION

According to the results of this research, there are a negative relationship between some dimensions of problem solving (impetuous approach and avoiding approach) and emotional intelligence, sub dimensions of problem solving (thinking approach, evaluating approach, self-confident approach and planned approach) is positively related to sub dimensions of emotional intelligence (intrapersonal, interpersonal, stress management, adaptability, and general mood). Emotional intelligence is related to an ability to make sense of emotions and their relationships with each other and find solutions to problems based on them (Mayer et al., 1999). According to Bedwell (2002), emotions may have some influences on decisions made, problem solving and the ways of interacting with others and the creativity and innovation within the education environment. The ability to perceive accurately, appraise and express emotions,

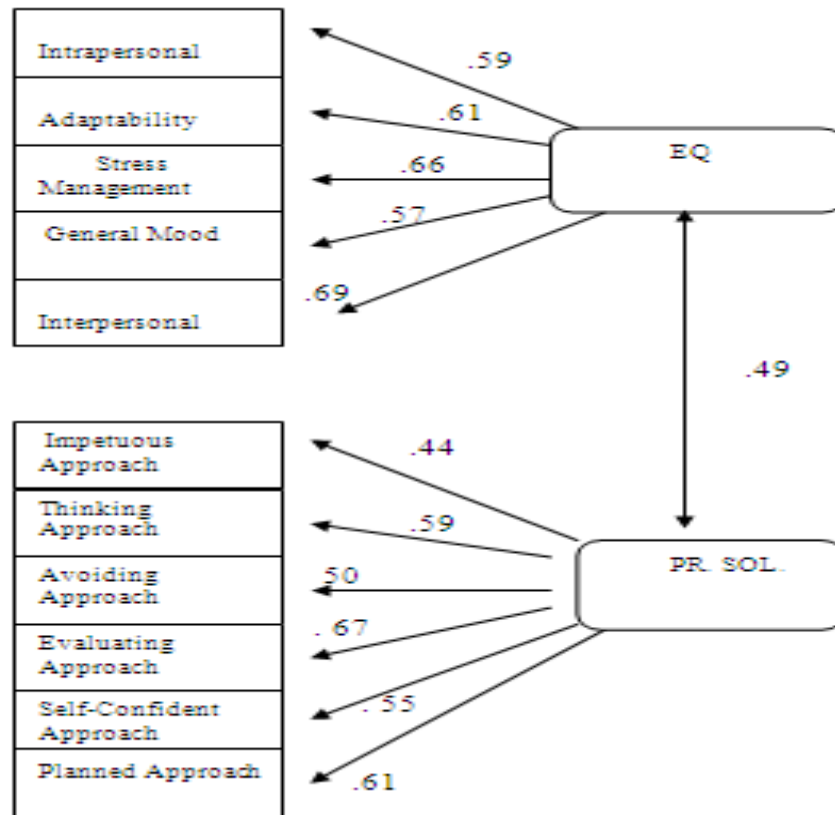


Figure 1. Path diagram of significant predictors of problem solving skills. $\chi^2=205.11$, $df=62$, $\chi^2/df= 3.3$, $p=0.00$, $RMSEA=.06$, $NFI=.91$, $NNFI=.94$, $CFI=.93$, $IFI=.97$, $RFI=.87$, $GFI=.96$, $AGFI=.96$, $SRMR=.19$.

the ability to access and create feelings to facilitate thought, the ability to understand emotions and emotional knowledge, and the ability to regulate emotions to promote emotional and intellectual maturity are parts of emotional intelligence (Mayer and Salovey, 1997). Matthew and Zeidner (2001) argue that essential parts of emotional intelligence are successful problem solving and coping with stressful events. Gohm et al. (2005) revealed that overall emotional intelligence can be useful in decreasing stress for some people but irrelevant for others. Carriochi et al. (2002) and Salovey et al. (2002) showed that emotional intelligence can be a moderator between stress and mental health. Furnham et al. (2002) found that there is a direct connection between emotional intelligence and healthy coping styles. Pelliteri (2002) noted that the more emotionally intelligent a university student, the higher tendency he/she has to use adaptive defense style.

According to many theorists and researchers, for proper functioning in daily life cognitive, behavioral and emotional processes are very important and they are prone to interactively affect each other (Aldea and Rice,

2006; Heppner et al., 1995). Emotional information can provide useful information for individuals to make sense of their reactions to different sources of stress and accordingly guidance in coping process (Alumran and Punamäki, 2008; Baker and Berenbaum, 2007; Greenberg, 2002). Specifically, emotional intelligence may help people to understand that there is a problem and lead them in the way towards problem-solving goal (Heppner and Krauskopf, 1987). The extent to which individuals regulate their emotions determines the ability to confront and deal with a problem (Aldea and Rice, 2006). Emotional intelligence consists of some abilities explaining how better understanding of emotion results in better problem solving (Mayer et al., 2000).

The greater emotional intelligence is, the more effective problem solving is as it enables people to see the problem from many different perspectives (Salovey et al., 2000). Moreover, higher levels of emotional intelligence are directly associated with better stress management, decision making and resilience (Bar-On, 2001; Bar-On and Parker, 2000; Mayer et al., 2000). Without making use of information coming from emotional cues and

reactions, deciding to use a particular problem coping strategy may have some negative effects. That is, developed emotional intelligence provides people with more resources to be used to determine the most appropriate problem-solving coping strategy in a particular situation (Bar-On, 1997; Saklofske et al., 2007; Salovey et al., 2002).

A direct association has been found between emotional intelligence and psychological and interpersonal distress levels. This connection is obvious according to theorists as people with high emotional intelligence manage and regulate their feelings in such a way as to reduce their stress and benefit those whom they interact with (Mayer et al., 2008). Particularly strong connection was found between high emotional intelligence and psychological and interpersonal functioning (Erozkan, 2013; Salovey et al., 2002, 1995). As high emotional intelligence has more likelihood of yielding more positive social outcomes and low emotional intelligence has been found to be connected with interpersonal conflicts and maladjustment; emotion seems to play an important role in interpersonal functioning (Mayer et al., 2000). For example, Birditt and Fingerman (2003) found that emotionally intimate relationships result in decreases in distress.

According to the claim of a number of researchers mental sets more or less suitable for solving certain kinds of problems are created by emotions (Palfai and Salovey, 1993). Different information processing styles are based on different emotions. Happy moods are more suitable for creative tasks requiring thinking intuitively so as to make new associations. On the other hand, sad moods result in emergence of a mental set in which problem solving proceeds more slowly due to more attention given to details.

According to Palfai and Salovey (1993), there are two styles of information processing which are intuitive and expansive versus focused and deliberate to be used for two different kinds of problem solving tasks. High scores on emotional intelligence may be an indication of good problem solving ability required to cope with the stressors.

D'Zurilla et al. (2004) report that individuals scoring high on positive problem orientation and rational problem solving and scoring low on negative problem orientation, impulsivity-carelessness style and avoidance style may obtain the most favorable problem solving outcomes. The main characteristics of a rational problem-solving style are the definition of the problem, determination of rational goals for the solution, creating alternative solutions and selection and implementation of the probable best solution and the utilization of this problem-solving style can minimize the possibility of failure (Chang et al., 2004; D'Zurilla and Nezu, 1999,). However, putting off the search for a solution and assigning responsibility to solve the problem to others result in the maintenance of the

problem situation.

Findings reported in the literature indicate that emotional intelligence and problem solving skills are closely associated with each other; yet, some sub-dimensions of problem solving such as impetuous approach and avoiding approach seem to be negatively correlated with emotional intelligence because in impetuous problem solving approach, the route usually followed is the one first coming to mind when a problem is faced; hence, there is a tendency to overlook alternatives. These findings reported in the literature demonstrate that with increasing emotional intelligence, problem solving skills of university students / pre-service teachers also improve. Therefore, emotional intelligence of university students / pre-service teachers can be claimed to make some contributions to finding solutions to their problems. As a consequence, it seems to be possible to improve the problem solving skills of university students / pre-service teachers by nurturing their emotional intelligence.

There are some limitations of the present study and they can be used to show the direction of future studies. The present study was conducted with pre-service teachers; thus, the results of the study cannot be generalized to other populations. Future research can address the relationship between emotional intelligence and interpersonal problem solving in other populations. Finally, it seems to be possible to improve the problem-solving skills of pre-service teachers by improving their emotional intelligence.

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