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Can I Solve the Problem? A Program Trail on Problem Solving Skill

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Abstract In this study the effectiveness of a guidance program prepared to improve the problem solving skill, which is an important part of development in many areas, from academic life to daily life, is investigated. The research is a model of pre-test and post-test experiment with control group. The sample of this study is 20 students selected from 9. grade students of Erzincan Anatolian Vocational School for Trade and Commerce High School. Problem Solving Inventory which was adapted to Turkish by Şahin, Şahin and Heppner [37] was used in this study. To analyze the data, Non-Parametric Mann Whitney U and Non-Parametric Wilcoxon Signed Rank Test were used. According to the result of this study, it is found that significant difference in problem solving skills of students who attended the trainingprogram by the side of students not attending the program.

Keywords: *problem, problem solving, training of problem solving*

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1. Introduction

We often face uncertain situations in the course of our daily life and we are expected to make "reliable" decisions in such cases. Making a prediction about the future, choosing the best one of two or more alternatives or reasoning on the strength of limited and/or non-objective information can be ranked among the situations where the behaviour of making a decision appears. The accuracy or applicability of decision process is measured with the suitability of decisions in question for statistical models. Likewise, according to Martinez, the behaviour of solving a problem is defined as a cognitive search in order to arrive at a right conclusion in the cases where the result is uncertain and problem solving is such an important skill that it has the characteristics of a passport so as to reach the future ([23], p.4).

When confronted with a problem we develop an action plan or strategy to solve it. But how do we develop that strategy and how do we choose which one of multiple strategies to select for the current problem? There appears to be a number of factors that influence strategy formation and selection. For example, the ability to think about a problem in multiple ways (cognitive flexibility) seems to enhance the ability to learn more about the problem, which in turn allows for the development of more efficient problem-solving strategies ([30], p.3).

Life, each moment of which is a problem that needs to be solved, is a developer process. We face some problems from infancy to old age in every stage and every field of life. In every stage of life, there are problems which need to be solved such as an object which is wanted to be reached at infancy, being able to study in a group in elementary education, conflicts with parents at puberty, problems with work at adulthood. These problems are steps for a person to develop himself/herself.

The human beings are in their lives every day confronted with the situations that are for them contradictory, containing obstructions that have to be overcome in order to achieve the aim, or the human beings experience various difficulties ([8], p.2798).

Why is problem-solving important? First of all, problem solving skill has a significant role in order that a student completes his/her development and prepares himself/herself for the future ideally, which are also the main aims of education. De Bono ([6], p.22) states the role of problem solving in development process as below. Problem solving is actually a basic need like a food or a game for a child and (s)he is together with it all the time. A child enjoys using his/her body while going down the slide or jumping on a trampoline and similary, (s)he likes using his/her mind while thinking. Secondly, it is important that problem solving skill should be improved so that charismatic leaders and geniuses of the future are brought up. The opportunities given in the name of problem solving at school terms may have a vital role in a person's contributing to societal life by solving the problems a person face in his/her coming years. Problem solving skill is of more vital importance at puberty where a person contacts with his/her surroundings more, spends more time with peers by being a little bit more alienated from family, starts to search for his/her identity and social problems arise.

While the researchers such as Gagne and Skinner (1964; 1974) are considered that they tend to analyze a person's past as the most important variable in the process of problem solving, other researchers; for example, Kohler and Maier (1925, 1970), support that the most important

element of problem solving is a person's way of perception of a situation faced ([14], p.366).

According to Oğuzkan, problem solving is a job of time, effort, energy and practice. It is related with a person's aim, need, value, belief, skill, habit and attitudes. Moreover, a person's tendency of problem solving is directly proportionate to hşs/her courage, desire and feeling of self-confidence (as cited in [40], p.4). Anderson [1] defines problem solving process as directing cognitive activities in turn by primarily focusing on cognitive activities ([1], p.119).

Problem solving can only start when a person perceives that (s)he needs to react to some extent. Furthermore, a person must have a target, so that (s)he makes effort to achive that target ([40], p.5). In other words, problem solving is a process where people find a solution to the problems interrupting while they achieve the target. Wickelgren (1979) signifies that a target, data and activities can be specified for every problem. Data are facts, words, concepts and activities to be able to be used for achieving the target. Activities are the ways of manipulating the data in order to achieve the target. Target is the solution of a problem ([16], p.34-37).

Change continuously in nature and society forms some problems which need to be solved as it changes balances, too. Therefore it is really difficult to differentiate problem and life [17]. This situation will be seen when the definitions in literatüre are scanned. The word problem derives from the word "problema" derived from "proballo" which means prominent obstacle in Greek ([34], p.129). Problem creates obstacles and emotional difficulty for a person in simple situations like the fact that we decide about which clothes we will wear in daily life or in complex situations like the fact that a scientist tries to solve a theory [32]. According to Morgan ([25], p.133), problem is a conflict situation where a person faces prevention in achieving a target. John Dewey defines problem as everything which confuses a person's mind, challenges her/him and blurs belief [21]. Problems with an object or a situation are confronted and similarly they can be confronted among people. Problem among people can be defined as a situation where at least one of the sides interacted with realizes the difference between present interaction way and ideal interaction, due to this difference (s)he feels tension and attempts to eliminate tension but these attempts are prevented ([26], p.9).

As a result, it can be said that problem solving is a complex process including cognitive, affective and behavioral activities. Heppner [15]'s definition is different from other definitions in some aspects. According to Heppner, problem solving is the synonym of coping with problems. In real life, problem solving personally is taken into account as directing cognitive and emotional activities like giving behavioral reactions with the aim of adapting to internal or external demands or calls in this definition.

In all of the definitions above, it is highlighted that problem handicaps between a person and his/her target and makes him/her face hardships. However, the important thing is actually that people cannot live with instability and inconsistency and therefore the situations described as problems are chances for a person's improving himself/herself. In Chinese, the word problem consists of two words: "Wei ji", "danger and chance". Therefore, each problem faced is a chance for better situations.

Problem solving is a process of overcoming obstacles faced during achieving a target. This process finds ways of eliminating tension and bringing an organism and internal balance together by means of adapting to conditions or decreasing obstacles. In this aspect, problem solving is data, skill and extensive ability which are necessary to be learned and obtained ([34], p:131). Problem solving is an ability to be learned and obtained. People should feel self-confident about solving their problems and consider this situation as a chance and a tool in order to get to the next point. Effective problem solving is also a special kind of thinking which becomes an expertise. Thanks to this, it leads to new and different –in other words creative- thoughts ([3], p.25).

Most of the consultants consulting psychological counselors assert that they consult as they have difficulty in actions of problem solving. For example, although a consultant has a plan to solve the problem, (s)he is unsuccessful at solving the problem as (s)he doesnot have social skills to be able to practise this plan or feels extremely anxious. Sometimes consultants don't persist enough while solving a problem and go into depression as they can't solve their problems. Here the problem is that they perceive their attempts to be able to solve the problem as inadequate. For this reason, the thing to be done is to evaluate behavioral, cognitive and emotional activities related with problem solving process in order to be able to determine and define certain difficulties in coping with and problems of handling to be generalized more ([16], p.34-37).

In a research done by Kaya [22], it is found that there is a significant relationship between the levels of problem solving skill university students perceive and their self-esteem levels, the levels of their self-esteem continuity, the levels of their depressive affectivity, the levels of their trusting people, the levels of their sensitivity to criticism, the levels of their psychosomatic symptoms and the levels of their feeling threat in relationships among people. Furthermore, it is found that the best variables predicting problem solving skill are self-esteem, sensitivity to criticism, feeling trust towards people and feeling threat in relationships among people ([22], p.118-119).

One of the important points in problem solving process is the process itself rather than reaching a solution. Because this process leads people to think, take the event into account in different aspects, feel self-confident and attempt to do something. Davidson, Deuser and Sternberg [5] defines problem solving process as an effort to reach the situation wanted from the one faced and they say that problem solving has advanced cognitive processes. These cognitive processes help a person to define a problem, to determine what the actual problem is and to determine how to reach a solution. According to them, 3 common qualities are seen in all the problems. These are data, aim and obstacles. Data are the information about the problem; aim is to solve the problem and obstacles are the drawbacks in front of the situation wanted to be reached. Andersen [1] defines problem solving as aim-oriented behaviours even if it is either deliberate or not. Van Duk and Kıntsch (1983) define problem solving as situations including some certain mental activitiy and steps when an aim is needed (as cited in: [43], p:1). Heppner [15] takes

problem solving into account as the synonym of coping with the problem. He defines problem solving as directing cognitive and emotional activities like giving behavioral reactions with the aim of adapting to internal or external demands. It can be defined that the strategies such as internalisation, expressing, denying are cognitive; the methods such as relaxation, trials and error of previous solutions are behavioral and seeking for emotional support, expressing the feelings towards the problem are emotional (as cited in: [38], p.14).

When the relevant body of literature about problem solving is done, it seems that the solution is reached after going through certain phases. These phases in body of literature are stated below as a summary.

1. Defining the problem after recognizing it: The beginning of problem solving process is to define the problem. It is important to define the problem in a realistic way by taking it into account with its all aspects as the right definition will be needed in order to reach the correct solution.
2. Analyzing the problem: Before solving the problem, it must be analyzed completely, data related with the problem must be collected and the relationships among each other must be revealed. In order to reach an effective solution, the information such as the limitations, dimensions, reasons and requirements of the problem must be determined by being thought sophisticatedly.
3. Developing alternative solutions: At this stage, ideas and probabilities related with solving the problem are offered. This stage is the stage where creative thinking is active. The possible keys are presented by reviewing data about the problem and the most suitable key is tried to be found by determining the positive and negative sides of these keys.
4. Practising the key chosen: At this stage the key chosen is put into practice. One of the important points at this stage is that implementation process is monitored. Thanks to this, it can be appointed whether the solution of the problem reach a solution wanted or not.
5. Evaluating the result: The results must be evaluated in a realistic way in order to determine the efficiency of the solution and whether new problems arise or not. This stage can be used for overcoming the difficulties faced during the solution process and finding more effective keys at the same time, too ([43], p: 29).

Behavioral Activities Related With Problem Solving Process

It is utterly complex and extensive. The behaviours giving on to problem solving are affected by 4 main variables. These are:

1. The kinds of actions tried before
2. The reason for the ineficiency of previous actions
3. The functional result of actions
4. The determination and perseverance of a person

Until a person applies for a counselor, (s)he acts several times. For this reason, the basic evaluation which needs to be done at first is to determine the quality of a person's previous actions for solving the problem. Furthermore, it is necessary to search how direct a person's approach towards the problem is. For example, has a person read books which can help himself/herself or has (s)he chosen to talk to his/her friends?

Another way is to search for the inefficiency. D' Zurilla and Goldried ([7], p.45-47) put forward that failure in problem solving is the result of the factors such as the fact that:

1. Effective reactions cannot be shown due to anxiety and some emotional preventions
2. There are no existing effective reactions in real life. The important point is whether there is any lack of behavior of a person indeed or anxiety factor which prevents skills to be put into practise is effective. One other criterion is to analyze the functional result of behaviours related with a person's problem solving. The approach used mostly is to face the problem directly.

Dorner determines that people who are unsuccessful at solving a problem continuously jump from a problem to another and finally they can't find any solution although they are active in terms of behaviour. Another situation is that unsuccessful problem solvers focus on only one problem by ignoring others and they can't reach a solution. Yet, a problem is closely related with other problems.

Cognitive Activities Related With Problem Solving Process

Cognitive activities are affected by 3 main variables:

1. Cognitive coping strategies
2. Arranging behaviours by means of cognitve processes
3. Controlling cognitive processes consciously

Heppner and Krauskpf ([16], p.34-37) range coping strategies used in problem solving in a way given below

1. **Reorganization of a problematic situation:** A person must reorganize the situation (s)he has perceptively and benefit from coping strategies for this. For example, (s)he must reduce the problem into its simpler substructure, determine subgoals which will lead to the solution of the problem, look through the problem within a long time and make plans which require taking precautions by preparing.
2. **Cognitive Rationalisation:** Mostly it is used for adults. Here, a person wants to eliminate the tension which not being able to cope with problems causes by finding reasonable reasons for the difficulty in problem solving – in other words, developing effective coping mechanism.
3. **People's ways of organizing their actions:** It is related with how consultants organize their actions in terms of especially targets imposed on, standards, results they get on their own, their plans, their senses of self, strengthening and punishing themselves ([44], p.83).

According to Bonner and Rich ([44], p.87) a person's evaluation of his/her problem solving skill affects his/her problem solving performance and process of coping with problems as a cognitive variable.

Emotive Activities Related With Problem Solving Process

Emotive activities play an important role in terms of affecting how people think and behave within problem solving process. To determine the behaviour of problem solving, people's emotive approach towards problems must generally be evaluated. Emotive activities are affected by 3 main variables:

1. Emotive coping strategies
2. The preventive and supportive effects of emotions on actions
3. The relationship among behavior, evaluation and emotion

Emotive cognitive strategies - in other words an individual's reorganization of the problem by changing his/her emotive reactions are quite effective strategies within problem solving process. As an example of emotive coping strategies, passive acceptance, optimism, desperate withdrawal, stable emotions and ways of cheering himself/herself up can be given.

Emotive reactions of a person can be preventive (tension, depression, etc.) and supportive (hope, satisfaction, excitement, pride, etc.), too. For example, a feeling of hope which may arise in people who tend to commit a suicide can be supportive for a person. For this reason, it is important for counselors to evaluate the function of emotive activities as the preventive or supportive factors affecting a person's coping process in order to understand his/her coping processes ([9], p.10).

In educational environment, problem solving process itself is more important than solving a problem. A child in this process discovers his/her talents and tries to improve them. The more problem solving is encouraged, the more the feelings of self-respect and self-confidence improve. The child feels like (s)he can do something independently. (S)he learns how to use the internal and external sources (s)he has in order to reach a solution (Bingham, 1998, p.29). One of educators' aims is that students can transfer what they have learned into new situations and problems they face. Problem solving skill also consists of the process of transferring information people have to life [24]. It may be not possible to learn problem solving skill in daily life. Therefore, educators need to teach these skills in a systematical way. There is a lot of research about the fact that effective problem solving skills can be taught and this will be able to be effective ([20,27,28,43]. One of the aims of developmental guidance approach practised at schools is to bring students problem solving skills. During problem solving trainings, problem solving process is taught to the attenders and applications are performed by way of examples and group discussions are included [2,11]. Özkök [28] states that as a result of the creative problem solving program they performed primary school students, the fact that students' averages are high can be the proof of the fact that problem solving skills can be gained by means of the problem practised. In the research done by Özdil [27], it is found that there is a significant difference among interpersonal problem solving skills of pre-school students who join the interpersonal problem solving training program.

As it is mentioned above, problem solving skill has an important denominator in this stage due to the fact that both the periods of the transition to puberty and to high school have peculiar characteristics. That's why, it is necessary that the programs for improving problem solving skill inside group guidance programs conducted by psychological counselors (school counselor). In this study, an instructional program which will contribute to the fact that students approach problems they have faced more systematically, they know problems they have faced in all their parts, they realize their feelings and thoughts related with this problem, they produce alternative solutions and evaluate them, in short problem solving skill has been developed.

The aim of this research is to analyze the instructional program developed with the purposes mentioned above. Within the scope of this aim, the hypotheses below are tried to be tested.

1. There is statistically no significant difference among the pretest scores means belonging to Problem Solving Inventory of students in experimental group and control group.
2. There is statistically no significant difference between the pretest scores means belonging to Problem Solving Inventory of students in control group who hasn't attended the training and their posttest scores means.
3. There is a statistically significant difference between the pretest scores means belonging to Problem Solving Inventory of students in experimental group who has attended the training and their posttest scores means.
4. There is a statistically significant difference between the posttest scores means belonging to Problem Solving Inventory of students in experimental group and control group.

2. Method

2.1. Research Model

The research has been done according to the experimental model with pretest-posttest control group. There are two groups constituted detachedly in the model with pretest-postest control group. One of these is taken as an experimental group and the other is control group. The preexperimental and postexperimental measurement are performed for each of the two groups ([19], p:97).

2.2. Population and Sample

The population of the research is the 9th grade students who study at Vocational High School (Ticaret Meslek Lisesi) in Erzincan in 2010.

The sample has been constituted by means of taking 10 of the students who are above the group mean in the score range of "Problem Solving Inventory" performed over 120 students into the experimental group and the other 10 of them to the control group by taking the principle of willingness and continuance. The 6-week-program for improving problem solving skill has been given to the experimental group. The range of the students sampled in experimental group and control group according to gender is given in Table 1.

Table 1. The Range of Students in Experimental Group and Control Group according to Gender

Gender	Experimental Group	Control Group	Total
Female	5	6	11
Male	5	4	9
Total	10	10	20

2.3. Data Collection Tool and Data Analysis

In this study, *Problem Solving Inventory* has been used as the data collection tool. The scale is 6-point likert scale

including 35 items. First of all, the scale developed by Heppner and Petersen [15] was adapted to Turkish by Şahin and Heppner [37]. It is found that the Cronbach Alfa internal consistency reliability coefficient of the scale is .88 and its reliability coefficient is .81 by means of split half method. The score interval of the scale varies between 32-192. The highness of total scores taken from the scale shows that an individual perceives himself/ herself as being insufficient about problem solving skill ([29], p:79).

The data analysis is done via *SPSS for Windows* program. Mann Whitney-U and Wilcoxon Signed Rank Test, which are used for non-parametric statistics, are used for determining the difference between the pretest-posttest scores of the experimental group and control group. The significance level for the research is stated as 0,05.

2.4. The Instructional Program

Improving Problem Solving Skill Program prepared by the researchers has been developed by reviewing the literature, analyzing the theoretic approach related with problem solving process and using problem solving approaches generally accepted in the literature as base. This program prepared is tried to be associated with the 9th-grade guidance program in the secondary education institutions and the examples of the educational, personal and etc. problem (e.g. field selection) which the 9th-grade students face are included inside the program.

The improving problem solving skill program consists of 6 sessions and the contents of these sessions include identifying the problem, determining the positive and negative ideas about the process, realizing the feelings about the process, improving problem solving process, determining the keys and evaluating them and carrying out the general evaluation of the program. The program was applied to the students for 90 minutes a week during 6 weeks.

2.5. The Stages in Problem Solving Process

D'Zurilla and Goldfried [7] divide problem solving process into the stages which can be defined. These are:

1). General Approach
2). Identifying the problem
3). Creating the alternatives
4. Giving a decision
5). Evaluation

Even if problem solving process can be evaluated as a single and homogeneous process, there are some proofs showing that this process is actually the total of different activities.

Heppenr [16] analyzes these stages independently of each other in terms of psychological counselling and each stage consists of different processes.

1. General Approach: This first stage is a mental tendency helping a person to adopt a certain solution or to reject, being able to be either supportive or preventive and directing him/her to behave in a certain way. The research findings show that individuals who trust their abilities and say that they can check the different aspects of their surroundings are better problem solvers. Also the research findings have shown that good problem solvers do not show impulsive behaviour and they are systematically interested in many problem solving behaviours. Another effective approach is to identify the problematic situations and then accept them the way they are. The general approach (approach or avoidance manner, whether (s)he can control or not and whether (s)he trusts her/his abilities) of an individual towards the problematic situations affects the strategy of solving the problems successfully and coping with them.

2. Identifying the Problem: This stage is related with the identification of the problem and its manner. The research done has shown that successful problem solvers have a lot of information about the problem, they succeed in understanding the core of the problem and their first step is to collect all the data and facts. A person can analyze the elements related with at least three fields in order to define the problem in a suitable way. Therefore, identifying a problem requires a skill with many qualities.

1. Evaluating himself/herself, his/her behaviours, knowledge, excitement and feelings about the problematic situation
2. Evaluating his/her surroundings related with the problematic situation
3. Clarifying the problematic situation and realizing the targets, expectation and conflicts

Freud's method of identifying the problem includes the analysis of the unconscious processes in the past in order to direct the consultant's need and conflicts and then the realization of the content the consultant brings. Similarly, the pro-Gestalt therapists (Pels and others., 1965) call attention to the present events here (non-verbal signs, feelings, excitement, situtations, and etc.) in order to relate to "uncompleted tasks".

Research is required in order to evaluate the relativity of different problem definition techniques. Arnkoff and Stewart call attention to the effectiveness of feedbacks videotaped about the importance of taking and choosing a model in terms of providing a person with more information in their research.

3. Creating the Alternatives: Forming alternatives requires selection as a matter of course since it is a target-oriented process. The research findings show that selection of the informatin is not a funciton of a person's past experiences; on the contrary, the ability of using past experiences is an important factor.

The number of the alternatives formed can be low due to the fact that personal problems carry emotional elements. There are research findings showing that the feeling of being prevented decreases the fluency of the actions and failures generally affect problem solving strategies in a negative way. Osborn's BRAINSTORMING method has 4 rules in terms of increasing the alternatives.

1. Avoiding the evaluation while the alternatives are being formed
2. Giving importance to free mental activity without any limitation.
3. Being high of the number of the ideas formed
4. Forming combinations of the alternatives suggested or trying to improve them

Gestalt approach tries to increase the amount of information the consultants have about themselves and teach the ways of distinguishing the similar events by changing the individual's "awareness" system.

Rogerian approach focuses on the consultant's feelings, accepting them and especially supporting the center of internal evaluation, so the perception of the consultant changes. The research done indicate that successful problem solvers often set their problems aside temporarily

and then return them again. In all reason, it can be said to be possible that the emotional and other preventive stimuli lose their effects if a person sets his/her problem aside and then returns it.

4. Giving a Decision: This process can be defined as choosing a certain one among a series of the alternatives for the action. According to Kuzgun, making a decision is to head for any alternatives in order to eliminate a hardship and it constitutes the most significant stage of problem solving process. The aim of deciding process is to help a person to go into a series of actions which will increase the possibility of being pleased with his/her decision.

The research related with deciding process put forward that there are 2 elements affecting deciding situation. These are:

1. Benefit value which can be objective or subjective
2. Probable results which are similarly objective or subjective

The benefit and probability theories are unified in a way giving great importance to education in terms of the results in deciding procedure developed by D'Zurilla and Goldfried [7]. So in addition to benefit and probability predictions, each person benefiting from the consultancy service is given a chance of evaluating personal, societal, long and short term results each alternative may reveal.

The aim of deciding process according to the psychological counsellor is to help the consultant dealing with a series of actions. The research about deciding processes during the consultation are analyzed and it has been determined that deciding successfully depends on some skills. These are:

1. Information
2. Evaluating the probabilities correctly
3. Evaluating the beneficial sides of the decisions
4. Evaluating the results of different alternatives

Therefore giving a decision includes the specific behaviours such as the evaluation of the probabilities and weighing the results ([7], p.11)

5. Evaluation: This stage includes practising the action plan and comparing the result with a certain standard. If a person compares his/her actions or control their conformity to the standard given (testing), (s)he produces new results from these activities or stop his/her actions. On the other hand, if a person's actions aren't in accord with a standard, (s)he continues his/her "process". Individuals have the ability of comparing the results of their action with a certain standard. These skills are functional in those ways below:

1. Determining successful results which forms the feeling of self-confidence
2. Defining the negativity and problematic situation which activates a formation to be able to restart problem solving process

Evaluation takes place in the last stage of problem solving after the action chosen is done and it is arranged in order to change the real result. If this stage doesn't exist, a person can insist on a performance whose direction of movement is uncertain instead of discovering correct solutions for his/her distress.

3. Findings and Comment

In this part, the analysis of the data obtained in the research is given.

The data about the mean of the pretest and posttest scores and standard deviation belonging to the experimental group and control group are given below.

Table 2. The Mean of the Experimental Group and Control Group's Pretest and Posttest Scores and Their Standard Deviation in terms of Problem Solving Inventory

Measurement	Groups	N	(X) Mean	(S)Standard Deviation
Pretest	Experimental Group	10	112,1	4,82
	Control Group	10	112,6	5,72
Posttest	Experimental Group	10	80	18,40
	Control Group	10	104,1	13,54

As it is seen in Table 2., it is found that the pretest mean of the experimental group in Problem Solving Inventory is 112,1, its standard deviation is 4,82 and the mean of control group is 112, 6 and its standard deviation is 5,72. It is found that the posttest mean of the experimental group is 80, its standard deviation 18,40 and the mean of the control group is 104,1 and its standard deviation is 13,54.

Hypothesis 1: There is statistically no significant difference among the pretest scores means belonging to Problem Solving Inventory of students in experimental group and control group.

Table 3. The Non-Parametric Mann Whitney-U Test Results of the pretest scores belonging to Problem Solving Inventory of Students in Experimental Group and Control Group

Group	N	Mean Rank	Rank Sum	U	z	P
Experimental	10	10,3	103	48,00	-0,153	,878
Control	10	10,7	107			

As it is understood from the table, as a result of the Non-parametric Mann Whitney-U test done for determining whether the pretest scores in Problem Solving Inventory of students in experimental group and control group are different or not, it is found that there is no significant difference among groups. That the difference between the pretest scores of the experimental and control group students is nonsense indicates that the preexperimental problem solving skills of these students are close to each other.

Hypothesis 2: There is statistically no significant difference between the pretest scores means belonging to Problem Solving Inventory of students in control group who hasn't attended the training and their posttest scores means.

Table 4. The Wilcoxon Signed Ranks Test Results of the Control Group's Pretest-Posttest Score Means belonging to Problem Solving Inventory

Pretest-Posttest	N	Mean Rank	Rank Sum	Z	P
Negative Ranks	8	5,62	45	-1,785	,074
Pozitive Ranks	2	5	10		
Equal	0				

As it is understood from Table 4, as a result of the Non-parametric Wilcoxon Signed Ranks Test test done for determining whether the pretest and posttest scores in Problem Solving Inventory of students in control group are different or not, it is found that there is no statistically significant difference among mean ranks. In other words, There has been no meaningful change in the problem solving skills of the students in control group who haven't attended the training.

Hypothesis 3: There is a statistically significant difference between the pretest scores means belonging to Problem Solving Inventory of students in experimental group who has attended the training and their posttest scores means.

Table 5. The Wilcoxon Signed Ranks Test Results of the Experimental Group's Pretest-Posttest Score Means belonging to Problem Solving Inventory

Pretest-Posttest	N	Mean Rank	Rank Sum	Z	P
Negative Ranks	10	5,5	55	-2,805	,005
Positive Ranks	0	0	0		
Equal	0				

As it is understood from Table 5, as a result of the Non-parametric Wilcoxon Signed Ranks Test test done for determining whether the pretest and posttest scores in Problem Solving Inventory of students in experimental group are different or not, it is found that there is a statistically significant difference among mean ranks and it is at a level of p<.01. The posttest score in Problem Solving Inventory has decreased significantly. In other words, it can be said that the training for improving problem solving has developed the problem solving skill of students in experimental group.

Hypothesis 4: There is a statistically significant difference between the posttest scores means belonging to Problem Solving Inventory of students in experimental group and control group.

Table 6. The Non-Parametric Mann Whitney-U Test Results of the Control Group and Experimental Group's Posttest Scores belonging to Problem Solving Inventory

Group	N	Mean Rank	Rank Sum	U	Z	P
Experimental	10	7.05	70,50	15,50	-2,614	,009
Control	10	13.95	139,50			

As it is understood from the table, as a result of the Non-parametric Mann Whitney U test done for determining whether the pretest scores in Problem Solving Inventory of students in control group and experimental group are different or not, it is determined that there is a statistically difference at a level of p<,01 between groups in support of the control group. It is found that the Experimental group students' score means are less than the Control group's students' score means. In other words, it is seen that the problem solving skills of the Experimental group students who have attended the training are higher than the Control group students who haven't attended the training.

When the findings of this research where the effectiveness of a guidance program conducted as a pretest-posttest trial model with a control group for improving the problem solving skill of 20 students chosen from 9th grade students are analyzed, it is seen that the posttest scores for the Experimental group is significantly different from the pretest scores of the Experimental group and the pretest-postest scores of the Control group and the problem solving skills of the subjects who have attended the training have increased.

4. Conclusion

The importance of problem solving skill must be highlighted more due to the 9th grade's being the first step of high school, the frequency of problems related with the academic life and the frequent discipline problems in additon to the fact that puberty is a special stage in terms of growing.

Eskin, Ertekin, Harlak and Dereboy [10] who analyze the relationship among the levels of depression, social support, problem solving, boldness and self-report of 805 students who are 9th grade reach a conclusion in their research that depression can be common among high-school teens and low self-respect, poor social support and inadequate problem solving skill are the risk factors of the depression seen in puberty.

In the relevant body of literature, there are some research prepared for improving problem solving skill based on group guidance activity and supporting this research where the effectiveness is tested. It is acted while preparing the training program by looking at the thought that "problem solving skill" in people is at different levels and the ways of using this skill effectively, efficiently, actively and healthily can be taught. In the content of the program developed by the researchers including 6 sessions, the identification of the problem, determination of the positive and negative thougths, realization of the feelings, formation of the problem solving steps as a process, determination and evaluation of the keys are included. Also, techniques such as discussion, question-answer, brain storming and case study and the warming games are included in order to activate the group dynamics, lose the resistance and increase the sharing and interaction among the members.

In a research developed by Wilczenski, Bontrager, Ventrone, Correia the students who attend and don't attend the problem solving skill training based on colloboration have been compared. In the research, the importance of group processes, group work and problem solving training with a group have been focused on. The group training based on colloboration has been effective in terms of "processes" in problem solving skill. The techniques such as discussion, observation, asking questions, being a model used during the training have increased the in-group communication and interaction positively. The students attending this training have been more successful than the ones not attending it.

It is possible to take the researchers studying on problem solving into two groups. *The ones in the first group* aim to seperate the main processes of problem solving, analyze the interaction among them and comment on the results within the scope of general mind functioning theory. *The ones in the second group* take problem solving with a holistic view. They support that there are Gestalt rules appearing during problem solving and not being able to come down to narrow-scoped processes in human mind. They put forward that we can reveal the main principles of problem solving and use this information in the practices without waiting the solutions of human mind's all secrets.

According to French and Rhoder (1992), many abilities which must be found in a person are needed to be able to solve a problem effectively. Some of them are general ability and starategies, special talent and strategies, the information about the content while solving a problem and the awareness of self and metacognitive processes about problem solving. Moreover, in the recent research, it is highlighted that the problem itself is also important as

well as the information a person have about the problem in using the problem solving skill. Also Sungur [34] and Terzi define the person who has the skill of creative problem solving as free and independent, open to feelings and excitements, flexible and original thinker, open-minded, sensitive to environment, self-sufficient, having a strong bond between his/her self- confidence and environment trust, sociable, brave and bold. In a research where the relationship between problem solving skill and people's harmony level, personal qualities, socio-demographic qualities and some cognitive variables is analyzed, it is called attention to the existence of some important relationships between problem solving and variables signified. In the research done abroad, it is determined that there is an important relationship between the perception of problem solving and hopelessness, the reasons for stress affecting the life negatively and suicide ideation. Starting from this, in the research for improving problem solving skill, taking different variables all together makes us think that this skill can be permanent and improving in addition to problem solving as a skill.

Dunkley, Blankstein, Williams and Winckworth taking the relationship between perfection and stress in 443 university students in terms of coping, avoidance and social support found that there is a relationship between coping with the problems and hardships actively and being a perfectionist as a personal quality as a result of the research. It is found that there is a highly significant relationship between avoidance, coping and the perception of social support and perfection and stress. Also in the same research, it is found that there is a relationship between having a problem solving skill and perfection. It is stated in the research that the effective problem solving skill training which will be given to people having these qualities will help to gain the behavior of coping creatively, successfully and effectively.

Problem solving skills have been learned since childhood and they are improved in school years. A student's success in problem solving depends on the development of his/her skills during problem solving process. Problem solving skill in education develops people's high level thinking skills such as people's skills of thinking and solving a problem critically, scientifically, creatively. Therefore people who know how to cope with problems and find solutions and practise them by using their creative, reasonable and scientific thought skills can contribute to modernization process (Kalaycı, 2001; Mayer, 1992, as cited in: [42]).

There are also some studies highlighting the importance of personal differences about problem solving. In a research done over 200 university students, it is determined that the students who perceive themselves as successful put on a closing approach instead of avoidance from problematic situations, has a self-control feeling and trust their problem solving skills. This group differs significantly from the group perceiving themselves as unsuccessful in terms of the cognitive, emotive, and behavioral stimuli.

In a research where the learned helplessness, academic success and problem solving skill of 360 9th grade students are compared, Sünbül and Gürsel [36], state that unsuccessful students perform more learned helplessness and have lower trust in their problem solving skill significantly than the successful ones.

As problem solving skill is a learnable cognitive quality, the reformation of the education programs providing students with rich experiences of problem solving skills can help them have a high perception of their problem solving skill. For this reason, a program can be prepared and practised for the development of problem solving skills concertedly (Soyer and Bilgin, 2010, as cited in: [31]).

It is worth noting that this study does not demonstrate a causal link between the factors obtained and the creative problem solving performance. Future lines of research should study the effect of CPS in blended learning context on creative problem solving abilities, utilizing structure equation model to verify the specific factors, which might be advantageous to instruction in higher education. Moreover, the qualitative research should be integrated in future research to investigate the empirical learning context that would enhance creative problem solving performance ([33], p.2135).

The studies in literatüre support the idea that problem solving is a skill and it can be developed and gained with training. This skill can have the quality of being adaptable to different people, time, events and environment. The incorporation, internalisation and adaptation to cognitive, emotive and behavioral fields in different ways effectively of this skill must be included in the long-term targets. With this research, bringing a program which will be able to contribute to the 9th grade students' coping with their problems is aimed in addition to the information in literature. The research has the constraint of being done with 9th grade students who continue high school. As it has been studied on the students who receive general high school education only, the effectiveness of the program needs to be tested over different high school types, too. In the direction of the data obtained, it is suggested that it must be taken among priority issues about guidance with the idea of the fact that problem solving skill training can contribute to high school students in educational, vocational and personal guidance activities. It should be thought as another suggestion that group guidance activities need to be preferred by school counsellors due to the group dynamics's contribution to social skill training.

In short, the success in problem solving process depends on identifying the problem correctly at first. In addition to the correct identification of the problem, enough information about the problematic situation must be obtained and the various behaviour manners thought to compensate the deficiency must be formulated and the alternative thought to lead to the best solution must be chosen to start. If it is succeeded after the alternatives are put into practice and evaluated, that way is continued; otherwise, another alternative is put into practice.

References

[1] Anderson, J.R. (1980). Cognitive Psychology and It's Implications. San Fransısco: Freeman.

[2] Atabay, N. (2004). "Sağlık meslek lisesi öğrencilerinin sorun çözme becerilerinin ve sorun çözme becerilerini etkileyen faktörlerin incelenmesi". Yayımlanmamış Yüksek Lisans Tezi, Marmara Üniversitesi,("Health vocational high school students' problem-solving skills, and problem-solving skills to examine the factors influencing." Unpublished Master's Thesis, Marmara University) İstanbul.

[3] Bingham, A. (1998). *Çocuklarda Problem Çözme Yeteneklerinin Geliştirilmesi.* (Development of Problem Solving Skills in Children). Milli Eğitim Basımevi, İstanbul.

[4] Bonner, R., Rich, A. (1988). "Negative Life Stress, Social Problem Solving Self Appraisal and Hopelesness: Implications for Suicide Researchs" Cognitive Therapy and Research, vol: 12.

[5] Davison, E., Deuse, R., Sternberf, R.J. (1994). *The Role of Metacognition in Problem Solving*, In Metcalfe & Shimamaura (Eds), Metacognition (207-226). MIT Press, Cambridge.

[6] De Bono, E. (1995). *Çocuklar Sorun Çözüyor*. (Children Solve Problems). İnkilap Kitabevi, İstanbul.

[7] D'Zur, lla, T., Goldfried, M. (1971). "Problem Solving Behavior Modification" Journal of Abnormal Psycology, vol : 18.

[8] Dostal, J. (2015). Theory of problem solving. *Procedia - Social and Behavioral Sciences 174 (2015) 2798-2805* Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license.

[9] Enç, M. (1982). Eğitim Ruhbilimi. (Psychology of education). İstanbul: Aka Kitabevi.

[10] Eskin, M; Ertekin, K; Harlak, H ve Dereboy, Ç. (2008). Lise Öğrencisi Ergenlerde Depresyonun Yaygınlığı ve İlişkili Olduğu Etmenler. (Prevalence of Depression in Adolescents and High School Student Factors to be associated). *Türk Psikiyatri Dergisi*, 19 (4): 382-389.

[11] Fireman, G., Kose, G,. Solomon, M.J. (2003). Self-observation and learning: The effect of watching oneself on problem solving performance. *Cognitive Development*, 18, 339-354.

[12] Eşkisu, M. (2009). "Liseli öğrencilerin zorbalık düzeyleri ile aile işlevleri ve algılanan sosyal destek arasındaki ilişkinin incelenmesi". Yayımlanmamış Yüksek Lisan Tezi, İstanbul Üniversitesi, ("High school students' level of bullying and family functions and to investigate the relationship between perceived social support." Unpublished Master's Thesis Languages, Istanbul University), İstanbul.

[13] Gleason, A.K., Campell-Jensen, A.L. and Richardson, D.S. (2004). Agreeableness as a predictor of aggression in adolescence. *Agressive Behaviour*, 30: 43-61.

[14] Heppner, P. (1978). **"** A Review of the Problem Solving Literatüre and It's Relatıonships to the Counseling Process**"** Journal of Counseling Psychology**,** vol: 25.

[15] Heppner, P.P., Petersen, C.H. (1982) The development and implications of a personal problem solving inventory. *Journal of Counselling Psychology*, 29, 66-75.

[16] Heppner, P. Krauskopf, K. (1987). "An Infromation Processing Apporach to Personal Problem Solving", The Counseling Psychologist. Vol:15,s- 34-37.

[17] Heppner, P.P., Witty, T. E., Dixon, W.A. (2004) Problem-solving appraisal and human adjusment: A rewiev of 20 years of research using the problem solving inventory. *The Counselling Psychologist*, 32: (3), 344-428.

[18] Kabadayı , R. (1990) "Problem Çözme Süreci, Gereği ve Eğitimdeki Boyutları" ("Problem Solving Process, Requirement and Sizes in Education"). Öğretmen Dünyası, sayı 146, Ankara: Nüve matbaası,

[19] Karasar, N. (2003). *Bilimsel Araştırma Yöntemi.* (Scientific Research Methods). Nobel Yayınları, Ankara.

[20] Kargı, E. (2009). *Bilişsel yaklaşıma dayalı kişilerarası sorun çözme becerileri kazandırma (BSÇ) programının etkililiği: Okul öncesi dönem çocukları üzerine bir araştırma.* Yayımlanmamış Doktora Tezi, Ankara Üniversitesi, (Interpersonal problem-solving approach based on cognitive thinking skills (PRS) program effectiveness: a study on preschool children. Unpublished PhD Thesis, University of Ankara). Ankara.

[21] Kasap, Z. (1997). *İlkokul 4. sınıf öğrencilerinin sosyo-ekonomik düzeye göre problem çözme başarısı ile problem çözme tutumu arasındaki ilişki.* Yayımlanmamış Yüksek Lisans Tezi, Marmara Üniversitesi, (Primary 4 students based on their socio-economic status with the success of problem-solving relationship between problem-solving attitude. Unpublished Master Thesis, Marmara University). stanbul.

[22] Kaya, N. (1992). "Ondokuz Mayıs Üniversitesi Öğrencilerinin Problem Çözme Becerileri ile Benlik Saygıları arasındaki İlişkiler" Yayınlanmamış Master Tezi. Samsun: Ondokuz Mayıs Üniversitesi sosyal Bilimler Enstitüsü. (19 May University Students' Problem Solving Skills with Relationship between Self-Esteem "Unpublished Master's Thesis. Samsun: Nineteen May University Institute of Social Sciences). Samsun

[23] Kökdemir, D. (2003). "Belirsizlik Durumunda Karar Verme ve Problem Çözme" Yayınlanmamış Doktora Tezi. Anakara Üniversitesi Sosyal Bilimler Enstitüsü, ("Uncertainty in Case Decision Making and Problem Solving" Unpublished PhD Thesis. Mainland University Institute of Social Sciences). Ankara.

[24] Mayer, R.E. (2002). A taxonomy for computer-based assesment pf problem solving. *Computers in Human Behavior*, 18, 623-632.

[25] Morgan, C.T. (2009). *Psikolojiye Giriş*. (Introduction to Psychology). Eğitim Akademi Yayınları, Konya.

[26] Öğülmüş, S. (2001). *Kişilerarası Sorun Çözme Becerileri ve Eğitimi.* (Interpersonal Problem-Solving Skills and Training). Nobel Yayınları, Ankara.

[27] Özdil, G. (2008). "*Kişilerarası problem çözme becerileri eğitimi programının okulöncesi kurumlara devam eden çocukların kişilerarası problem çözme becerilerine etkisi".* Yayımlanmamış Yüksek Lisans Tezi, Adnan Menderes Üniversitesi, ("Interpersonal problem-solving skills training program for children attending preschool institutions, impact on interpersonal problem-solving skills." Unpublished Master's Thesis, Adnan Menderes University). Aydın.

[28] Özkök, A. (2005). Disiplinlerarası yaklaşıma dayalı yaratıcı problem çözme öğretim programının yaratıcı problem çözme becerisine etkisi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi,* Interdisciplinary approach to curriculum-based creative problem solving creative problem-solving skills of influence. Hacettepe University Faculty of Education Journal), (28, 159-167).

[29] Savaşır, I., Şahin, N.H. (1997). *Bilişsel-Davranışçı Terapilerde Değerlendirmede Sık Kullanılan Ölçekler.* (Cognitive-Behavioral Therapy Scales Commonly Used in the Assessment). Türk Psikologlar Derneği Yayınları, No:9, Ankara.

[30] Sharlene, N., Pruce, B., Rusia,A., and Burns, T (2010). The Effect of Strategy on Problem Solving: An fMRI Study. *The Journal of Problem Solving, volume 3, no. 1 (Fall 2010)* Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license.

[31] Sezen, G ve Paliç, G. (2011) *Lise Öğrencilerinin Problem Çözme Becerisi Algılarının Belirlenmesi*. (High School Students' Perceptions of Problem Solving Skills Determination). 2nd International Conference on New Trends in Education and Their Implications 27-29 April, 2011 Antalya-Turkey, www.iconte.org, Siyasal Kitabevi, Ankara, Turkey, 2011.

[32] Sonmaz, S. (2002). *Problem çözme becerisi ile yaratıcılık ve zeka arasındaki ilişkinin incelenmesi.* Yayımlanmamış Yüksek Lisans Tezi, Yıldız Teknik Üniversitesi, (Problem-solving skills by examining the relationship between creativity and intelligence. Unpublished Master's Thesis, Yıldız Technical University), İstanbul.

[33] Sophonhiranraka, S., Suwannatthachoteb, P. and Ngudgratokec,S (2015). *Factors affecting creative problem solving in the blended learning environment: a review of the literatüre.* Procedia - Social and Behavioral Sciences 174 2130-2136. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license/

[34] Sungur, N. (1992). *Yaratıcı Düşünce*.(Creative Thinking) Özgür Yayın Dağıtım, İstanbul.

[35] Sünbül, D. (2008). "*Müzakere (problem çözme) ve arabuluculuk eğitim programının ortaöğretim 9. sınıf öğrencilerinin çatışma çözme becerileri, öfke kontrolü ile özsaygı düzeyleri üzerindeki etkisinin incelenmesi."* Yayımlanmamış Yüksek Lisans Tezi. ("Negotiation (problem solving) and mediation training program for secondary school Grade 9 students conflict resolution skills, anger control and examination of the impact on the level of self-esteem." Unpublished Master's Thesis). Dokuz Eylül Üniversitesi, İzmir.

[36] Sünbül, A. M.; Gürsel, M. (2001). Başarılı ve Başarısız Lise Birinci Sınıf Öğrencilerinin Öğrenilmiş Çaresizlik ve Problem Çözme Becerilerinin Karşılaştırılması Selçuk Üniversitesi Eğitim Fakültesi Sosyal Bilimler Dergisi Sayı, 12, Sayfa, 12-28, (Successful and Unsuccessful High School First Grade Students and Problem Solving Skills Learned Helplessness Comparison of Selcuk University Faculty of Education Journal of Social Sciences, 12, Page, 12-28). Konya.

[37] Şahin, N., Şahin, N., Heppner, P.P. (1993) Psychometric properties of the problem solving inventory in a group of Turkish university students. *Cognitive Therapy and Research*, 17: (4), 379-396.

[38] Tanrıkulu, T. (2002). *Yetiştirme yurtlarında ve aile ortamında yaşayan ergenlerin bilişsel yapıları (olumsuz otomatik düşünceler)*

ve problem çözme becerileri açısından incelenmesi. Yayımlanmamış Yüksek Lisans Tezi, Marmara Üniversitesi, (Adolescents living in orphanages and family environment cognitive structures (negative automatic thoughts) and be examined in terms of problem-solving skills. Unpublished Master Thesis, Marmara University). İstanbul.

[39] Taştan, N. (2004). *Çatışma çözme ve akran arabuluculuğu eğitim programlarının ilköğretim altıncı sınıf öğrencilerinin çatışma çözme ve akran arabuluculuğu becerilerine etkisi.* Yayımlanmamış Doktora Tezi. Ankara Üniversitesi. (Conflict resolution and peer mediation training programs sixth grade students the skills of conflict resolution and peer mediation effect. Unpublished PhD Thesis. Ankara University). Ankara.

[40] Taylan, S.(1990). *"Heppner'in Problem Çözme Envanteri'nin Uyarlama, Geçerlik ve Güvenirlik Çalışmaları"* Yayınlanmamış Master Tezi. Ankara: A.Ü. Sosyal Bilimler enstitüsü, "Heppner's Problem Solving Inventory Adjustment, Validity and Reliability Studies" Unpublished Master's Thesis. Ankara: Ankara University Institute of Social Sciences). Ankara.

[41] Thornton, S. (1998). Çocuklar Problem Çözüyor. (Children Solve Problems). Gendaş Yayınları, İstanbul.

[42] Yıldırım, A., Hacıhasanoğlu, R., Karakurt, P. & Türkleş, S. (2011). Lise öğrencilerinin problem çözme becerileri ve etkileyen faktörler. *Uluslararası İnsan Bilimleri Dergisi (High school students' problem-solving skills and influencing factors. International Journal of Human Sciences [Online]).* [Bağlantıda]. 8:1. Erişim: http://www.insanbilimleri.com.

[43] Yıldız, A.S. (2003). *Ebeveynin problem çözme becerisini geliştirmeye yönelik deneysel bir çalışma.* Yayımlanmamış Doktora Tezi, İstanbul Üniversitesi, (Parents of an experimental study to improve problem-solving skills. Unpublished PhD Thesis, University of Istanbul). İstanbul.