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ANALYSIS OF THE RELATIONSHIP BETWEEN DECISION MAKING SKILLS AND PROBLEM SOLVING SKILLS OF PRIMARY SCHOOL STUDENTS

Research article

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Abstract

Decision making and problem solving skills are two important issues resulting with students' academic achievement. The aim of this research was to examine the relationship between primary school students' decision making skills and problem solving skills. The sample of research, which was carried out through relational survey model, consisted of 331 third and fourth grade primary school students in Istanbul. Data were collected through "Problem Solving Inventory for Children" and "The Scale of Decision Making Skills for Primary School Students". The research data were analyzed with descriptive statistics, Pearson Correlation analysis and simple regression analysis. According to the results of correlation analysis, it was determined that there was a positive significant relationship between decision making skills and problem solving skills of primary school students. It was concluded that decision making skills of students were significant predictors of their problem solving skills. As a result, it is seen that students' decision making skills affects problem solving skills moderately and positively.

Keywords: problem solving skills, decision making skills, primary school students, relational survey

1. Introduction

Problem solving and decision making are critically important skills for an effective teaching and learning environment. Improving students' abilities to solve problems and make decisions is recognized as an important issue in education. In fact, problem solving is an analytical process generally used to describe possible solutions to situations. It is a complex process. Making decisions is a part of problem solving. So, it is impossible to think them separately.

Problems are an integral part of lives for most individuals. These take place in terms of number of areas, for instance, home, family, relationships, education, jobs, career, financial resources, travelling, health and so forth. In some cases, problems are in a major form, whereas, in other cases, they are in a minor form (Kapur, 2020). A problem is defined as a task, activity or situation for which a solution is not immediately identified, known, or obtainable. It is generally accepted as a barrier to attain some desired goals under conditions of uncertainty (Bourne, Ekstrand & Dominowski, 1971). Problem solving, therefore, is the process of identifying a solution that resolves initial perplexity or difficulty (D'Zurilla, 1986;

D’Zurilla & Goldfried, 1971). Problem solving includes using obtainable information to identify and find solutions to problems. Problem solving is a nonroutine mental or physical activity that successfully removes, circumvents or overcomes a goal (Tallman, 1988). Shortly, problem solving is a continuous, conscious process which searches to reduce or correct the difference between actual and desired conditions.

Before problem solving process, individuals need to conduct an analysis of a problem. They need to be well-aware in terms of problems. Problems can also be opportunities. They may allow individuals to see things differently and to do things in a different manner (Kapur, 2020). D’Zurilla and Goldfried (1971) suggested a four-step training model for solving a problem. The first step is to describe problem; the second step is to generate multiple response alternatives; the third one is to select the best solution and the last one is to verify effectiveness of selected solution. Following these steps could be beneficial during problem solving.

On the other hand, decision making is a critical cognitive process that is required in every area of human life. In teaching-learning environment, students play an active role and obtain outputs parallel with their functional use of decision making skills. Therefore, decision making process and skills regarding the effective management of this process can affect the course of life, life satisfaction, their success and social relations of students (Colakkadioglu & Celik, 2016). Decision making is thought as one of the steps in problem solving. Decision making is a choice made by using one’s judgement. The art of making decisions is a particularly important skill for students.

Decision making is the process of identifying and selecting among possible solutions to a problem according to the demands of situation (Taal & De Carvalho, 1997). Students need to make numerous decisions as part of problem solving. They generally use their decision making skills to determine which solution to follow (Giulioni, 2019). Decision making is a critical skill which can make or break an organization. Decisions should be timely made (Gavin, 2020). This process is often a factor, which can determine future success (Hershey, Walsh, Read & Chulef, 1990).

An important step in decision making is framing. Good decision makers create decision frames for specific problems. Decision frames delineate how a question is set up to be answered. Framing issues can be considered such as the perspective taken, elements of problem to be considered and criteria used to choose one solution over another. Framing helps to simplify problem by including some and excluding other information (Martin, Donohoe & Holford, 2016). The aim in making decisions is to evaluate solutions that could be realized and to attain positive results by implementing them. Making decision is a special type of solving problems. Decision making is part of the problem solving and it takes part in three steps. Firstly, students should identify potential solutions. Secondly, they should determine which solution is the best fit for problem. Lastly, they should make a decision to reach solutions (Holtzclaw, 2012).

Problem solving and decision making are not synonymous with each other, however; they are both critical skills for students. The terms of problem solving and decision making are specifically used interchangeably since they have common elements. For example, both problem solving and decision making involve critical thinking. Critical thinking is a process by which students question their own assumptions as well as those of others in order to decide to solve a problem. According to Simon (1986), decision making and solving problems require attention, setting goals, finding or designing suitable courses of action, and evaluating and choosing among alternative actions. The first three of these activities, that is, fixing agendas, setting goals, and designing actions, are usually called problem solving; the

last ones, evaluating and choosing, are usually called decision-making.

Problem solving and decision making are not the same but harmonious. Effort has been expended to discuss their correlation and irreplaceable role that creativity has in decision making (Galli, 2020). As it was said above, both problem solving and decision making have some models including some steps to apply. Moreover there are other theoretical models taking into account these two skills together. According to Yahaya and Yusuf (2018), it could be handled with in ten steps. The first one is identification of scenarios. This means that there is a scenario in a complex area where decisions need to be made. The second step is to accept scenarios. The accepting stage of model is to make students who are decision makers understand that in any given scenario someone has to be accountable of situation. The third step is to understand scenarios. Students have to understand what kind of scenario they are to deal with to solve problem. The next one is to search for alternative ways to solve problem. This stage is one of the most critical stages to undergo, as it gives additional ways to find solutions. The fifth step is to examine suggested alternatives. This level can also be called or refer as “Divergent” where ideas are flow from different points of views. The next one is to analyze the best alternatives. In this stage all possible solutions that are carefully gathered and listed to make decision or solve problems. The seventh step is to select the best alternative. The stage is more of “Convergent thinking” which refers to figure out a certain established solution to a problem. The eighth step is to review selected alternative. The lasts steps are implementation of selected alternative and morning the course of action. The implementation stage is the finishline where decision is allowed to take place in given scenario that alternative is created for. The last stage is final and one of challenged parts as all action of what has been undergo from stage 1-9 are all monitor here for success.

Problem solving and decision making are important skills for effective learning and teaching. In process of problem solving, it is necessary to decide on what the best solution is for given problem. In this context, a relation between the process of problem solving and decision making exists. When students have these skills, they are able to cope with the problems they face. These skills affect and determine students’ education process. There are many studies on the impacts of problem solving and making decisions skills (Heppner, Hibel, Neal, Weinstein & Rabinowitz, 1982; Brown & Mann, 1991; Naftel & Driscoll, 1993; Eldeleklioğlu, 1996; Singh & Chaudhary, 2015). However, most of these studies are not related to primary school students. Turkey is culturally and socially different. This could affect students’ points of views. In this research, it is attempted to investigate whether there is a relationship between problem solving skills and decision making skills of primary school students. It is thought that the results of this study will provide practical and objective data on development decision making and problem solving skills of other students. The aim of this research was to examine the relationship between primary school students’ decision making skills and their problem solving skills. In light of this general purpose, following questions were sought:

- 1- What is the level of decision making skills and problem solving skills of primary school students?
- 2- Do primary school students’ decision making skills level and problem solving skills level differ significantly according to gender, kindergarten attendance and grade?
- 3- Is there a significant relationship between primary school students’ decision making skills and their problem solving skills?
- 4- Do primary school students’ decision making skills significantly predict their problem solving skills?

2. Method

In this research, relational research design was used to determine whether there was a relationship between two or more variables or the degree of the relationship. Relational research design is used in those cases when there is an interest to identify the existence, strength and direction of relationships between two variables. This association cannot be used to draw conclusions with regard to cause-effect relationship between variables (Cohen, Cohen, West & Aiken, 2003). So, in this research, main aim was to examine whether there was a relationship or not between variables.

2.1. Sample

The sample of research was determined with random sampling method. 331 students from two primary schools in Sultanbeyli district of Istanbul took part in research. 217 (65.6%) of these students were 4th grade and 114 (34.4%) were 3rd grade students. 172 (52.0%) of them were female and 159 (48.0%) were male students. In addition, 199 of these students (60.1%) went to kindergarten before starting primary school and 132 (39.9%) of them never went to kindergarten.

2.2. Data Collection Tools

Data were collected with "Problem Solving Inventory for Children" developed by Serin, Bulut Serin and Saygılı (2010) and "Decision Making Scale for Primary School Students" developed by Sever and Ersoy (2019). Problem Solving Inventory for Children was developed by applying to 568 primary school students in order to measure the level of self-perception of primary school students (4th, 5th, 6th, 7th and 8th grade) regarding problem solving skills. Exploratory factor analysis was conducted to determine the validity of inventory. In inventory, consisting of 24 items in total, there were 12 items in "Confidence in Problem Solving Skills" factor, 7 items in "Self-Control" factor and 5 items in "Avoidance" factor. A total of three factors were obtained. Total variance explained by three factors was 42.26%. In addition, confirmatory factor analysis was performed to test the factor structure of inventory. It was confirmed that these three-factor with 24 items had a valid structure. For reliability of inventory, Cronbach's alpha reliability coefficient was calculated. Values were respectively found as 0.85, 0.78, 0.66 for sub-dimensions and 0.80 for the whole scale. Cronbach's alpha reliability coefficient was determined as 0.85 for the total score. Inventory was in 5-point Likert type and score range was 24-120. High total scores obtained from inventory indicate that individuals perceived themselves as sufficient in problem solving. Permission was obtained from authors who developed inventory for this research.

Decision Making Scale for Primary School Students was applied to 489 fourth grade students in order to determine decision making skills of them. Data from 306 participants were used for exploratory factor analysis and 183 for confirmatory factor analysis. As a result of exploratory factor analysis, a structure consisting of 15 items with one factor was obtained. Factor loads of items varied between .53-.74. Cronbach's Alpha reliability coefficient was calculated as .89, and variance it explained was calculated as 40.07%. For reliability of scale, Cronbach's alpha reliability coefficient was calculated as .89. Scale is a four-point Likert type with a score range of 15-60, and there are no reverse scored items in scale.

2.3. Data Collection and Analysis

Research data were collected from approximately 340 students studying in the third and fourth grade at two primary schools in Sultanbeyli, Istanbul. Data were collected on a voluntary basis with the consent of participants. Students were informed about how inventory would be filled. 32 of collected data were not evaluated because they were incomplete or incorrect. In analysis, Skewness and Kurtosis values were calculated to determine whether

data showed a normal distribution or not. These values were found to be between +1.96 and -1.96. Corder and Foreman (2009) stated when data is between +1.96 and -1.96, it shows a normal distribution. In addition, the results of Kolmogorov Smirnov normality test of inventory showed that data were normally distributed ($p>.05$). So, it was determined that descriptive statistics tests, t-test and one-way ANOVA test, Pearson correlation analysis and regression analysis were applied in analyzes. Analyzes were applied at .05 significance level.

3. Findings

Findings obtained in research are presented below in line with the sub-problems. Descriptive statistics were applied to determine the level of decision making skills and problem solving skills of primary school students and results in Table 1 were presented.

Table 1. Descriptive Statistics of Students' Decision Making and Problem Solving Skills

Scale / Variable	Total / Sub-dimensions	N	K	X	SS	X/K
Decision making skills	Total	331	15	45.67	7.78	3.04
	Total	331	24	90.13	13.69	3.80
Problem solving skills	1. Confidence in Problem Solving Skills	331	12	46.38	7.99	3.83
	2. Self-Control	331	7	24.30	5.60	3.47
	3. Avoidance	331	5	19.44	4.22	3.88

As it can be seen in Table 1, the average scores of students regarding their decision making skill levels are at level of "generally" ($\bar{x}=3.04$), and their average scores for their problem solving skill level are at level of "I often behave like this" ($\bar{x}=3.80$). In addition, the sub-dimension of confidence in problem solving ($\bar{x}=3.83$), self-control sub-dimension ($\bar{x}=3.47$) and avoidance sub-dimension ($\bar{x}=3.88$) are at level of "I often behave like this".

T-test was applied to determine whether there was a significant difference in decision making skills and problem solving skills level of primary school students according to their gender, grade and kindergarten attendance. Findings were presented in Tables 2, 3 and 4.

Table 2. T-Test Results of "Gender" Variable of Students' Decision Making and Problem Solving Skills

Scale / Variable	Total / Sub-dimensions	Gender	N	X	SS	t	p
Decision making skills	Total	Female	172	45.87	8.31	.475	.63
		Male	159	45.46	7.17		
Problem solving skills	Total	Female	172	91.99	13.67	2.58	.01
		Male	159	88.13	13.47		
	1. Confidence in Problem Solving Skills	Female	172	47.58	8.01	2.86	.00
		Male	159	45.08	7.79		
	2. Self-Control	Female	172	24.53	5.23	.76	.44
		Male	159	24.06	5.99		
3. Avoidance	Female	172	19.87	3.87	1.92	.055	
	Male	159	18.98	4.53			

As it can be seen in Table 2, when decision making and problem solving skill levels of students were examined according to gender variable, there was no significant difference in

decision making skills of male and female students ($t=.475$; $p>.05$). However, it was determined that there was a significant difference in problem solving skills ($t=2.58$; $p<.05$). It was determined that female students' problem solving skills ($\bar{x}=91.99$) were higher than male students ($\bar{x}=88.13$). According to gender variable, it was determined that there was a significant difference ($t=2.86$; $p<.05$) in confidence in problem solving skills sub-dimension. It was found that there was no significant difference in self-control ($t=.76$; $p>.05$) and avoidance ($t=1.925$; $p>.05$) sub-dimensions. It was determined that female students' confidence in problem solving skills ($\bar{x}=47.58$) were higher than male students ($\bar{x}=45.08$).

Table 3. T-Test Results of “Grade” Variable of Student’ Decision Making and Problem Solving Skills

Scale / Variable	Total / Sub - dimensions	Grade	N	X	SS	t	p
Decision making skills	Total	3th grade	114	49.83	6.70	7.87	.00
		4th grade	217	43.49	7.41		
Problem solving skills	Total	3th grade	114	94.83	14.23	4.66	.00
		4th grade	217	87.67	12.75		
	1. Confidence in Problem Solving Skills	3th grade	114	49.84	7.30	6.11	.00
		4th grade	217	44.56	7.75		
	2. Self-Control	3th grade	114	25.21	6.17	2.13	.03
		4th grade	217	23,83	5.23		
3. Avoidance	3th grade	114	19.78	4.73	1.04	.29	
	4th grade	217	19.27	3.92			

According to Table 3, when decision making and problem solving skills of students were examined, there was a significant difference in decision making skills ($t=.787$; $p<.05$) and problem solving skills ($t=4.66$) of the third and fourth grade students. It was determined that third grade students' decision making skills ($\bar{x}=49.83$) and problem solving skills ($\bar{x}=94.83$) were higher than fourth grade students. In addition, according to grade variable, it was seen that there was a significant difference in the sub-dimensions of students' confidence in problem solving skills ($t=6.11$; $p<.05$) and self-control ($t=2.13$; $p<.05$). However, it was found that there was no significant difference in avoidance sub-dimension ($t=1.04$; $p>.05$). Third grade students' confidence in problem solving skills ($\bar{x}=49.84$) and self-control ($\bar{x}=25.21$) were found to be higher than fourth grade students.

Table 4. T-Test Results of “Kindergarten Attendance” Variable of Students’ Decision Making and Problem Solving Skills

Scale / Variable	Total / Sub- dimensions	Kindergarten Attendance	N	X	SS	t	p
Decision making skills	Total	Yes	199	45.39	7.58	-.807	.42
		No	132	46.10	8.07		
Problem solving skills	Toplam	Yes	199	90.36	13.39	.359	.72
		No	132	89.80	14.17		
	1. Confidence in Problem Solving Skills	Yes	199	46.15	7.72	-.625	.53
		No	132	46.72	8.40		
	2. Self-Control	Yes	199	24.35	5.52	.192	.84
		No	132	24.23	5.75		
3. Avoidance	Yes	199	19.84	4.03	2.09	.03	
	No	132	18.84	4.43			

According to Table 4, it was found that there was no significant difference in decision making ($t=-.807$; $p>.05$) and problem solving ($t=.359$; $p>.05$) skills of students who went to kindergarten and those who did not. It was observed that there was no significant difference in sub-dimensions of students' confidence in problem solving ($t=-.625$; $p>.05$) and self-control ($t=.192$; $p>.05$). However, a significant difference was found in avoidance sub-dimension ($t=2.09$; $p<.05$). It was determined that avoidance ($\bar{x}=19.84$) skills of students who went to kindergarten were higher than students who did not.

Pearson Correlation analysis was applied to determine relationship between decision making skills of primary school students and their problem solving skills and findings were presented in Table 5.

Table 5. Pearson Correlation Results of Students' Decision Making and Problem Solving Skills

Scales	Problem solving skills (Sub-dimensions and total)			
	1. Confidence in Problem Solving Skills	2. Self-Control	3. Avoidance	Total
Decision making skills (Total)	.620	.244	.264	.543

$p<0.05$

As it can be seen in Table 5, it was determined that there was a positive and moderately significant relationship between students' decision making skills and problem solving skills ($r=.543$). If correlation coefficients is between 0-0.29, it indicates low relationship; if it is between 0.30-0.64, it is medium; if it is between 0.65-0.85, it is high and if it is between 0.85-1.00 it shows very high relationship (Ural & Kılıç, 2013). There was a positive and medium level ($r=.620$) relationship between students' 'decision making skills' and 'confidence in problem solving skills' sub-dimension. It was determined that there was a positive and low level significant relationship between self-control ($r=.244$) and avoidance ($r=.264$) sub-dimensions.

Regression analysis was applied to determine whether decision making skills of primary school students significantly predicted their problem solving skills and findings were presented in Table 6.

Table 6. Regression Analysis Results of Students' Decision Making Skills Predicting Problem Solving Skills

Independent variable	Dependent variable	B	Std. Error	(β)	t	p	R	R ²	F	p
Stable	Problem solving skills	46.455	3.774	.543	12.308	.00	.543	.295	132.832	.00
Decision making skills		.956	0.81		11.740	.00				

$p<0.05$

As it is seen in Table 6, students' decision making skills significantly predicted their problem solving skills by 29% ($R=.543$; $R^2=.295$) ($p<.05$). In other words, linear relationship between students' problem solving skills (predicted/dependent variable) and decision making skills (predictor/independent variable) was at a statistically significant level. According to Cohen (1988), the effect size of ".10" explains 1% of total variance and this is a low effect. ".30" effect size explains 9% of total variance and this is a medium effect. ".50" effect size explains 25% of total variance and this is expressed as a big effect (Cited in Field, 2009: 56-

57). Students' decision making skills explain about 30% of change in problem solving skills. It is seen that it affects students' decision making skills and problem solving skills moderately and positively.

4. Conclusion and Discussion

In this research, decision making and problem solving skills level of primary school third and fourth grade students, relationship between these two skills, and predictive status of decision making skills on their problem solving skills were determined.

Average scores of students' decision making skill levels are at level of “generally”, and average scores for their problem solving skill levels are at level of "I often behave like this". In addition, students' problem solving skills are at level of "I often behave like this" in confidence in problem solving, self-control and avoidance sub-dimensions. Youngstrom, Wolpaw, Kogos, Schoff, Ackerman and Izard (2000) examined the effect of problem solving skills training program in order to improve children's interpersonal problem solving skills. As a result of research, it was found that children produce more solutions to problems and their destructive behaviors decreased more.

It can be said that problem solving skills and decision making skills of primary school students are at a high level. Similar to this, a research conducted by Demir Barutcu (2019), examining the effect of problem solving skills on clinical decision making levels in nursing students, found that students' problem solving skills were high and their clinical decision making status was at a good level. However, as a result of another research conducted by Veysel and Birol (2017), it was found that problem solving skill levels of physically disabled athletes and sub-dimensions of problem solving skills were hasty, thinking, avoidant, evaluative, self-confident and planned approach levels below middle level. Among sub-dimensions of self-esteem and decision making style in decision making, it was found that the levels of careful decision making were below middle level, and the levels of avoidant, procrastination and panic decision making were above middle level.

When decision making and problem solving skill levels of students were examined according to “gender” variable, it was observed that there was no significant difference in decision making skills of male and female students. However, it was determined that there was a significant difference in problem solving skills. Problem solving skills of female students were higher than male students. Aubrey, Ghent and Kanira (2012) examined the effectiveness of curriculum to develop thinking skills such as problem solving and critical thinking related to mathematics and literacy on children aged 5-6. It was observed that the continuous interaction of children due to the content of curriculum, asking questions and informing educators about program was an important factor in effectiveness and permanence of curriculum.

It is seen that female students feel more confident than male students in problem solving. Similarly, Güçray (2001) investigated relationship between decision making behaviors, self-esteem and problem solving skills in adolescents. In this research, it was revealed that gender variable had significant effects on students' decision making behaviors. However, a research conducted by Özdemir (2019) was related to the role of secondary school 7th and 8th grade students' automatic thoughts and decision making styles in explaining their problem solving skills. In this research, it was discussed that the mean of problem solving scores did not differ significantly between male and female students. However, it was observed that male students' decision making styles mean scores were significantly higher than female students' decision making styles score averages. In Demir Barutcu's (2019) research, it was concluded that

problem solving skills of students did not differ according to gender variable.

When decision making and problem solving skill levels of students were examined according to “grade” variable, it was found that there was a significant difference in decision making skills and problem solving skills of the third and fourth grade students. Third grade students' decision making and problem solving skills were higher than fourth grade students. In her study, Casey (1990) applied a thinking skills training program to children in order to improve their planning and problem solving skills. As a result of research, it was concluded that both planning and problem solving scores of children who attended program were significantly higher than children attending other kindergartens. In Özdemir's (2019) research, it was revealed that the mean scores for problem solving and decision making styles between 7th and 8th grade students did not differ significantly. In Demir Barutcu's (2019) research, it was concluded that problem solving skills of students did not differ according to grade.

When decision making and problem solving skill levels of students were examined according to “kindergarten attendance” variable, it was indicated that there was no significant difference in decision making and problem solving skills of students who went to kindergarten and who did not. Taal and De Carhalvo (1997) observed in their experimental study to develop children's decision making skills in favor of children in experimental group. In research, the fact that children received an education program based on different activities caused them to encounter many stimulants and their decision making skills were improved. In an another research conducted by Pekdoğan (2019), the effect of problem solving skills training program on decision making skills of children who are 5-6 years old and attending pre-school education was examined. It was concluded that the program was effective on children's decision making ability.

It was determined that there was a positive and moderate significant relationship between students' decision making skills and problem solving skills. In addition, it was determined that there was a positive and moderate relationship between students' 'decision making skills' and “confidence in problem solving skills” sub-dimensions, and a positive and low level significant relationship between self-control and avoidance sub-dimensions. Students' decision making skills significantly predicted their problem solving skills at a rate of 29%. In other words, the linear relationship between students' problem solving skills (predicted/dependent variable) and decision making skills (predictor/independent variable) was at a statistically significant level. Accordingly, students' decision making skills explain about 30% of change in problem solving skills. It can be said that it affects students' decision making skills and problem solving skills moderately and positively. Bacanlı (2000) has argued that individuals who utilize effective decision making styles obtain more satisfaction from their lives. Cenkseven-Onder and Colakkadiolugu (2013), when findings obtained from their research are considered, it is understood that problem solving skills and decision making styles are influential on individual's well-being.

In Güçray's (2001) study conducted to examine the relationship between decision making behavior, self-esteem and problem solving skills perception in adolescents revealed that there were positive significant relationships between decision making behaviors, problem solving and self-esteem. It has been observed that perception of self-esteem and problem solving skills had significant contributions in predicting decision-making behaviors. As a result of Özdemir's (2019) research, a significant positive relationship was observed between the problem solving skills of high school students and the sub-dimensions of decision making styles, self-esteem, and prudent selectivity. It was observed that there was a significant negative correlation between the sub-dimensions of decision making styles of carelessness,

panic, and avoidance of responsibility. It was observed that automatic thoughts and decision making styles explained 52% of the total variance as a predictor of problem solving skills. It was concluded that these variables can be considered as predictors of problem solving skills. In another research conducted by Deniz (2004), there was a significant relationship between university students' self-esteem in decision making with problem solving and careful, avoidant, panic and delaying decision-making styles. Dokuzlar (2017) aimed to examine relationship between problem solving skills and decision making strategies. In this research, there was a significant relationship between problem solving skills and decision strategies. Demir Barutcu (2019) found that there was a strong, negative, statistically highly significant relationship between students' problem solving skills and their clinical decision-making scale scores in nursing. Problem solving skills of students had a positive effect on their clinical decision making skills. Veysel and Birol (2017) said that there was a positive relationship between problem solving and decision making self-esteem score and careful decision making score of physically disabled sportsmen. In addition, there was a negative relationship between problem solving and avoidant decision making score, delaying decision making score and panic decision making score. Studies show that there is generally a positive relationship between decision making skills and problem solving skills.

Studies show that there is generally a positive relationship between decision making skills and problem solving skills. It is seen that this result coincides with the results of the research. Various activities, teaching methods and techniques can be applied in teaching practices to improve these skills. For example, by presenting real life problems in lessons, it can be ensured that students apply problem solving steps correctly and make effective decisions in solving the problem. In this way, it can be contributed to students' getting ready for real life conditions. At this point, researchers can conduct experimental studies on what activities, teaching methods and techniques can be effective in the development of these skills. The relationship of these skills can be examined in terms of different variables with a longitudinal sample group from primary school to high school.

References

- Aubrey, C., Ghent, K., & Kanira, E. (2012). Enhancing thinking skills in early childhood. *International Journal of Early Years Education*, 20(4), 332-348. doi: <https://doi.org/10.1080/09669760.2012.743102>
- Bacanlı, F. (2000). Kararsızlık ölçeğinin geliştirilmesi. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, 2(14), 7-16.
- Bourne, L. E., Ekstrand, B. R., & Dominowski, B. R. (1971). *The Psychology of thinking*. Englewood Cliffs, N.J: PrenticeHall.
- Brown, Y. E., & Mann, L. (1991). Decision making competence and self-esteem: A comparison of parents and adolescents. *Journal of Adolescence*, 14(4), 363-371.
- Casey, M. B. (1990). A planing and problem solving preschool model: The methodology of being a good learner. *Early Childhood Research Quarterly*, 5, 63-67.
- Cenkseven-Önder, F., & Çolakkadıoğlu, O. (2013). Decision-making and problem-solving as a well-being indicator among adolescents. *Educational Research and Reviews*, 8(11), 720-727.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioural sciences (3rd ed.)*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
- Colakkadioglu, O., & Celik, B. (2016). The effect of decision-making skills training programme on self-esteem and decision-making style. *Eurasian Journal of Educational Research*, 16(65), 259-276. doi: <http://dx.doi.org/10.14689/ejer.2016.65.15>
- Corder, G. W., & Foreman, D. I. (2009). *Nonparametric statistics: A step-by-step approach*. New Jersey: John Wiley & Sons.
- Çimşir, S., & Baysal, Z. (2019). Marmara üç aşamalı bilişsel karar verme becerilerini geliştirme modelinin akademik başarısı düşük ilkokul dördüncü sınıf öğrencilerinin problem çözme becerisine etkisi. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi*, 5(3), 337-351. doi: <https://dergipark.org.tr/en/pub/ekvad/issue/51148/666501>
- D'zerulla, T. J., & Goldfried, M. R. (1971). Problem-solving and behavior modification. *Journal of Abnormal Psychology*, 78, 107-126.
- D'Zurilla, T. J. (1986). *Problem-solving therapy: A social competence approach to clinical intervention*. New York: Springer.
- Demir Barutcu, C. (2019). Hemşirelik öğrencilerinde problem çözme becerisinin klinik karar verme düzeylerine etkisi. *SDÜ Tıp Fakültesi Dergisi*, 26(1), 22-29. doi: <https://doi.org/10.17343/sdutfd.422401>
- Deniz, E. (2004). Üniversite öğrencilerinin karar vermede öz saygı, karar verme stilleri ve problem çözme yöntemleri arasındaki ilişkinin incelenmesi üzerine bir araştırma. *Eğitim Araştırmaları Dergisi*, 4(15), 25-35.
- Dokuzlar, Ş. (2017). *Liselerde öğrenim gören ergenlerin problem çözme becerilerinin ve karar verme stratejilerinin incelenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Doğu Akdeniz Üniversitesi Lisansüstü Eğitim, Öğretim ve Araştırma Enstitüsü, Gazimağusa, Kuzey Kıbrıs.
- Eldeleklioğlu, J. (1996). The relation between decision-making strategies and the parents attitudes. Unpublished PhD Dissertation, Gazi University, Ankara.

- Field, A. (2009). *Discovering statistics using SPSS introducing statistical method*. Sage Publications: London.
- Galli, M. S. (2020). Managerial problem solving and decision making. Walden University. <https://www.researchgate.net/publication/342697536>
- Gavin, M. (2020). 5 key decision-making techniques for managers. Business insights. doi: <https://online.hbs.edu/blog/post/decision-making-techniques>
- Giulioni, J. W. (2019). Are you a reflective or reflexive leader? Smart brief. doi: <https://www.smartbrief.com/original/2019/02/are-you-reflective-or-reflexive-leader>.
- Güçray, D. (2001). Ergenlerde karar verme davranışlarının öz saygı ve problem çözme becerileri algısı ile ilişkisi. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 8(8), 106-121. doi: <https://dergipark.org.tr/en/pub/cusosbil/issue/4364/59692>
- Heppner, P. P., Hibbel, J., Neal, G. W., Weinstein, C. L., & Rabinowitz, F. E. (1982). Personal problem solving: A descriptive study of individual differences. *Journal of Counseling Psychology*, 29, 580-590.
- Hershey, D. A., Walsh, D. A., Read, S. J., & Chulef, A. S. (1990). The effects of expertise on financial problem solving: Evidence for goal directed problem solving scripts. *Organizational Behavior and Human Decision Processes*, 46, 77-101.
- Holtzclaw, E. (2012). *Power of consistency: 5 rules*. <https://www.inc.com/eric-v-holtzclaw/consistency-power-success-rules.html>
- Kapur, R. (2020). *Problem Solving Skills: Essential Skills in Providing Solutions to Personal and Professional Problems*. <https://www.researchgate.net/publication/343690626>
- Martin, L. C., Donohoe, K. L., & Holford, D. (2016). Decision-making and problem-solving approaches in pharmacy education. *American Journal of Pharmaceutical Education*, 80(3), 52-60.
- Naftel, M. I., & Driscoll, M. (1993). Problem solving and decision making in an eighth grade class. *Adolescent Psychology*, 66(3), 177-187.
- Özdemir, B. (2019). *Ortaokul öğrencilerinin problem çözme becerilerinde otomatik düşüncelerinin ve karar verme stillerinin rolü*. Yayınlanmamış Yüksek Lisans Tezi, Maltepe Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.
- Pekdoğan, S. (2019). The effect of the problem solving training program on the children's decision making skills. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi*, 21(3), 1-17.
- Serin, O., Bulut-Serin N., & Saygılı, G. (2010). İlköğretim düzeyinde çocuklar için problem çözme envanteri'nin (ÇPÇE) geliştirilmesi. *İlköğretim Online*, 9(2), 446-458.
- Sever, İ., & Ersoy, A. (2019). İlkokul öğrencileri için karar verme becerisi ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışması. *Çukurova University Faculty of Education Journal*, 48(1), 662-692.
- Simon, H. S. (1986). The behavioral foundations of economic theory. *The Journal of Business*, 59(4), 209-224.
- Singh, A., & Chaudhary, A. K. (2015). SETP: A new powerful tool for improving problem solving, decision making and creativity in teenagers. *The International Journal of Indian Psychology*, 2(3), 10-15.
- Taal, M., & De Carvalho, F. S. (1997). Stimulating adolescents decision making. *Journal of Adolescence*, 20, 223-226.

- Tallman, I. (1988). Problem solving in families: a revisionist view. In *Social Stress and Family Development*. (ed.) D. M. Klein and J. Aldous. New York: Guilford.
- Ural, A., & Kılıç, İ. (2013). *Bilimsel araştırma süreci ve SPSS ile veri analizi*. Detay Yayıncılık.
- Uygur, S. (2018). Lise öğrencilerinde problem çözme becerilerinin akılcı olmayan inanç düzeyi ve karar verme stillerine göre yordanması. *Elektronik Sosyal Bilimler Dergisi*, 17(67), 1014-1026.
- Veysel, T., & Birol, S. Ş. (2017). Bedensel engelli sporcuların problem çözme becerilerinin karar verme stillerine olan etkisinin belirlenmesi. *Journal of International Social Research*, 10(49), 800-807.
- Yahaya, R. S., & Yusuf, M. M. B. (2018). The im decision making and problem solving model: a unisex context. <https://www.researchgate.net/publication/328957868>
- Youngstrom, E., Wolpaw, J. M., Kogos, J. L., Schoff, K., Ackerman, B., & Izard, C. (2000). Interpersonal problem solving in preschool and first grade: Developmental change and ecological validity. *Journal of Clinical Child Psychology*, 29(4), 589–602.