Available online at www.sciencedirect.com

ScienceDirect

Procedia Social and Behavioral Sciences 1 (2009) 1099–1104

Procedia
Social and Behavioral Sciences

World Conference on Educational Sciences 2009

# The effect of academic risk taking levels on the problem solving ability of gifted students

Bayram Tay[a*], Didem Özkan[b], Betül Akyürek Tay[c]

[a]*Department of Elementary Education, Ahi Evran University, Kirsehir 40100, Turkey*[*]
[b]*Umit Science and Art Center, Ankara 06930, Turkey*
[c]*Yusuf Demir Science and Art Center, Kirşehir 40100, Turkey*

Received October 23, 2008; revised December 18, 2008; accepted January 4, 2009

**Abstract**

The ability of Academic risk taking is a critical component which considers academic success at the top level. To increase the academic success to a higher level needs adaptation to the present conditions. Adaptation will be possible via problem solving. In this study it has been described that the relationship between the levels of taking academic risk of gifted student with their levels of problem solving abilities. The study data is collected by using data collection tools which are the scale of academic risk taking one of which was developed by Clifford (1991) and was adapted to Turkish by Korkmaz (2002) and another scale of problem solving skills which was developed by Yaman (2003). The opinions of totally 103 students who answered the questions were taken. According to the results; the conclusion was "academic risk taking levels and problem solving ability level of gifted students is positively high. There is a significant relationship between them".


*Keywords:* Gifted students, academic risk taking; problem solving ability.

## 1. Introduction

It can not be seen a common description in literature related to risk taking. For that reason we have to look some descriptions up. The risk taking behavior is described as a behavior which has no precision about its results (Rosenbloom, 2003). On the other hand, Çiftçi (2006) explained the risk taking behavior as the eagerness on; making mistake and to defend the situations which don't comply with traditions and aren't popular or to try to solve the problems which don't have certain solutions. Therefore risk taking behavior can be concluded positively or

* Bayram Tay. Tel.: +90-0386-211-4419; fax: +90-0386-213-4513.

*E-mail address*: bayramtay@ahievran.edu.tr.

1877-0428/$–see front matter 
doi:10.1016/j.sbspro.2009.01.198

negatively. If we take positive conclusions, they are; person's working hard to develop himself, his being enterprising, his trying to learn beyond his experiences and abilities (Little, 2006).

Although it's not seen a common opinion on the definition of "Risk Taking", there is consensus on what these behaviours are (Çiftçi, 2006; Little, 2006; Martin, 2006; Chu-Min, Yu-Win, Ling-Wen, Chi-Chung, Li-Yung& Wen-Hsiu, 2007; Mac Govan, 2007). We can categorize those behaviors in five principal groups.

1. The risk taking behaviors about traffic (Driving without license, driving over speed, driving drunk, to drive very close behind etc.).
2. The risk taking behaviors about sexuality (Sexual intercourse in early ages, sexual intercourse without using any birth- control method, Sexual intercourse with someone who carries HIV risk etc.).
3. The risk taking behaviors about taking drugs (Using substances which gains addiction like hashish, heroin, morphine, smoking, alcohol drinking etc.).
4. The risk taking behaviors about dangerous sports (Climbing, diving, sky-diving, windsurfing, cave exploration etc.).
5. Academic risk taking behaviors (The eagerness of succeeding again following failure, showing no reaction following failure etc.). Observed academic risk taking behaviors are grouped generally under three topics.
   The behaviors which reflect the tendency of carrying negative feelings following failure
   The behaviors which reflect the tendency of preferring hard processes.
   The behaviors which reflect the tendency of straightening again and being effective.

Academic risk taking behavior, describes the students' courage and unwillingness in quarreling against difficulties and their learning situations (Korkmaz, 2002). Academic risk taking increases; individual's performance, resistance against difficulty, his capability about the subject which is taken risk about, his academic level and the happiness gained as a result of carrier. The theory related to motivation considers the academic risk taking as a powerful origin of learning, increasing motivation and developing present skills (Clifford, 1988).

Taking risk in learning environment requires to think deeply about a problem or a subject, to share this thought with the others thus to listen to their critics and then to increase those experiences through solution or solutions (Yıldırım, Tay & Ateş, 2007). At this point academic risk taking can include problem solving.

Problem generally is described as a difficulty which is wanted to get rid of or a question which its answer is found out (Aksu 1984). William James described the problem as "searching several proper methods to reach to the destination". According to James the most important part of problem is its difficulty level. There is no problem where there is no difficulty (from, Poyla 1981). The problem solving process can't be randomly. This process should be in a definite order and must be performed inside specific rules. According to Johnston and Paul (1970) those rules are listed below (as cited in Akyürek Tay):

a. Read the problem to find the general social meaning, b) read the problem again to get the arithmetic problem, c) read the problem again by recording related and unrelated factors, if additional information is needed, research it, d) evaluate the data in the basis of findings, e) guess the answer, f) solve the problem, g) compare the solution with the answer.

The steps taken during the problem solving process according to Mark (1994) stated by John Dewey as following:

1. Perception and sense of a difficulty.
2. The awareness and description of the problem.
3. The present solutions being offered
4. The points about this problem being processed first.
5. The solution being tested.

Individuals fall into an inner obligation during the process of problem solving. This process probably requires taking risk mostly. Gifted child is the child who is intellectual, creative, who shows high performance capability in art and science like fields or to improve those abilities and needs activities and events in special subjects which he can not have in his school (Galleger, 1990). With this study it has been tried to find out a reasonable relationship between the risk taking levels and problem solving levels of gifted students.

## 2. The Purpose of the Study

The purpose of this research is to determine the existence of the relation between academic risk taking levels and problem solving skills of superior intelligent students. It is demanded to respond the below questions for achieving this goal

1. What is the taking academic risk level of superior intelligent students?
2. What is the problem solving skill level of superior intelligent students?
3. Is there a meaningful relation between academic risk taking levels and problem solving skills of superior intelligent students?

## 3. Limitations of the Research

The source of data and diagnosis of this research is limited with the 4, 5, 6 and 7'th grades students who attends the Ankara Ümit Science and Art Center and Kırşehir Yusuf Demir Science and Art Center in the fall season and the validation of collected data is limited with the group which the poll applied.

## 4. Method

In the Research descriptive method was used. This method is executed to enlighten the given situation, to make assessments in line with the standards and to introduce the possible relation between the present events. In this kind of researches the main goal is to make acknowledgement and assessment in depth about the examined situation (Çepni 2007).

## 5. The Universe and the Sampling

In the research limited universe was used that called as study universe (Karasar 2005). For this reason the 4., 5., 6., and 7'th grades students who attends to Ankara Ümit Science and Art Center and Kırşehir Yusuf Demir Science and Art Center is composed the limited universe. Information about Subjected universe and sampling is shown in table 1.

Table 1: Information about study universe and sampling

| | Ümit Science and Art Center | | | | Kırşehir Y.D.Science and Art Center | | | |
|---|---|---|---|---|---|---|---|---|
| | The universe of study | | Sampling | | The universe of study | | Sampling | |
| Grades | f | % | f | % | f | % | f | % |
| 4. Grade | 1 | 1,3 | 1 | 1,3 | 17 | 27,4 | 17 | 27,4 |
| 5. Grade | 30 | 40,0 | 25 | 33,3 | 15 | 24,2 | 8 | 12,9 |
| 6. Grade | 26 | 34,7 | 18 | 24,0 | 14 | 22,6 | 10 | 16,1 |
| 7. Grade | 18 | 24,0 | 13 | 17,3 | 16 | 25,8 | 11 | 17,7 |
| Total | 75 | 100 | 57 | 75,9 | 62 | 100 | 46 | 74,2 |

According to the table 1, it can be said that this research approximately corresponds at the 75 percent of the students' study universe who was included in the sampling.

## 6. Data Collection Instruments

In the reseach as an instrument of data collection, academic risk taking scale which was developed by Clifford and translated by Korkmaz (2002) and Problem Solving Skills Scale by Yaman (2003) were employed

## 7. Academic Risk of the Scale

The scale was developed to measure the students' training positions and courage fighting against the difficulties and willingness/unwillingness in 5 likert type scale. Scale 36 consists of article. The article is graded as: "it is correct for me", "for me I am generally the right", "I am sometimes the right", "for me it is rarely right" and "for me it is never right". It was translated in Turkish and reliability coefficient was calculated as .89 by Korkmaz (2002). This scale was applied by Çiftci (2006) on 81 students in 6th class and its reliability coefficient was calculated as .80. It is found out that reliability coefficient is .78 in this study. And also used as a whole and no precise assessment is prepared using the sub-factors

## 8. Scale of Problem Solving Skills

This scale was developed by Yaman (2003) to define the skills of students for solving problems they face either in daily life or in classes. The questions in the problem solving scale were prepared to define how students behave and feel when a problem occurs. Scale consists of 30 questions. The validity and reliability studies of the scale were made by Yaman (2003) and calculated as 0.87. In this study the reliability factor of the scale was calculated as .83.

## 9. Analyzing the Data

The computer was used to analyze the quantitative data derived by data collecting devices. The data collected for sub problems were transferred to computer and SPSS program was used for statistical analyze of the data. One sample T test and Pearson Correlation Factor Value were calculated about points gained from the test for research sub-problems.

## 10. Findings and Comments

Academic risk taking skill points average of the students was carried out to one sample T test against the expected average, for defining academic risk taking levels of gifted students. When the expected average dispersion is provided how to interpret high and low scores were introduced. In such condition, if the other variants are ignored, the lowest point is the point of student who took one point for each of the scale article.( 36 for 36 article since the quinary likert type academic risk taking scale is used). Accordingly the highest point is the point of the students who took 5 points for each of the scale articles.(180 for 36 article). Expected average is the average of students who took 3 points for each of the articles.(108 for 36 article). If the average points of the students are higher than the expected average, the academic risk taking levels of the students can be defined high, If the average points of the students are lower than the expected average, the academic risk taking levels of the students can be defined as low, and If the average points of the students are same with the expected average the academic risk taking levels of the students can be defined as medium. The related table is as follows.

Table 2. Academic risk taking skill levels of gifted students

| N | $\overline{X}$ | ss | Expected Average | sd | t | p |
|---|---|---|---|---|---|---|
| 103 | 133,50 | 17,95 | 108 | 102 | 14,411 | .000<.01 |

When the table 2 is analyzed, the difference between the academic risk taking points of the students and the expected average is at p = .01 level. Accordingly the academic risk taking levels of the gifted students can be interpreted as positively high.

Problem solving skill point's average of the students was carried out to one sample T test against the expected average, for defining problem solving skill levels of gifted students. When the expected average dissolved how to interpret high and low scores were introduced. In such condition, if the other variants are ignored, the lowest point is the point of student who took one point for each of the scale article.( 30 for 30 article since the quinary likert type academic risk taking scale is used). Accordingly the highest points are the points of the students who took 5 points for each of the scale articles (150 for 30 article). Expected average is the average of students who took 3 points for each of the articles (90 for 30 article). If the average points of the students are higher than the expected average, the problem solving skill levels of the students can be defined high, If the average points of the students are lower than the expected average, the problem solving skill levels of the students can be defined as low, and If the average points of the students are same with the expected average the problem solving skill levels of the students can be defined as medium. The related table is as follows.

Table 3. Problem solving skill levels of gifted students

| N | $\overline{X}$ | ss | Expected Average | sd | t | p |
|---|---|---|---|---|---|---|
| 103 | 118,63 | 12,72 | 90 | 102 | 22,88 | .000<.01 |

When the Table 3 is analyzed, the difference between problem solving skill points of the students and the expected average is at p = .01 level. Accordingly the problem solving skill levels of the gifted students can be interpreted as positively high.

Pearson correlation factor value was calculated to define if there is a valuable relation between academic risk taking levels and problem solving skills of gifted students. The related table is as follows.

Table 4. Academic risk taking skill levels and problem solving skill levels of gifted students

| Variants | n | r | p |
|---|---|---|---|
| "Academic risk taking levels point" | | | |
| | 103 | ,60** | ,000 |
| "Problem solving skills point" | | | |

When the table 4 is analyzed it can be seen that, there is a highly valuable, positive relation between academic risk taking levels and problem solving skills of gifted students (r=0,60 , p < .01). Accordingly it can be stated that problem solving skill levels of the students are increased as the academic risk taking levels keep increasing.

## 11. Result, Discussion and Suggestions

1. It was seen that the academic risk taking levels of gifted students are positively high (Table 2).
2. It was seen that the problem solving skill levels of gifted students are positively high (Table 3).
3. It was seen that, there is a highly valuable, positive relation between academic risk taking levels and problem solving skills of gifted students (Table 4).

One of the motivation principles explained much in Educational Psychology is that, to make person deal with high level problems which contribute to learning motivation. In this way one would take much more risk for learning something new by endeavoring more. People who preferred academic risk taking are permanently insistent

for learning and they endeavor more for learning something new. (Atkinson 1957, Clifford 1990). Problem solving level of the people, whose academic risk taking level is high, could be increased. Accordingly the expectations of the people are widened by taking academic risk, unlimited learning opportunities occur for them. Student takes the responsibility of failure and success he/she had, by taking academic risk. He can't give any excuses for any failure he/she had (Belfiore, Auld & Lee, 2005). And this can increase his/her determination for success.

A research made by Heppner and others states that, students who are successful in problem solving , evaluate themselves as stimulated for problem solving and believe luck is less important in this matter and they perceive themselves as more careful , decisive , consistent intuitive and systematical. (as cited in Sarı, 1998), Accordingly it can be concluded that , students with high problem solving skills , expose academic risk taking manners.

Below suggestions can be made according to research results.

Since, there is a remarkable relation between academic risk taking levels and problem solving skill levels, students can be taught and brought in academic risk taking manners together with problem solving skills.

## References


Aksu, M. (1984). Bildiriler. 1. Felsefe ve Sosyal İlimler Kongresi. Erzurum, 1984

Akyürek Tay, B. (2002). *İlköğretim 4. ve 5. sınıf sosyal bilgiler dersinde öğrencilerin problem çözme becerilerini geliştirmede işbirliğine dayalı öğrenmenin etkisi konusunda öğretmen, müfettiş ve uzman görüşleri,* Ankara: Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü (Yayımlanmamış Yüksek Lisans Tezi).

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64*, 359–372.

Belfiore, P.J., Auld, R., & Lee, D.L. (2005). The disconnect of poor-urban education: Equal Access and a pedagogy of risk takink. *Psychology in the Schools*, 42, 855-863.

Chu-Min, L., Yu-Win, H., Ling-Wen, H., Chi-Chung, L., Li-Yung, W., & Wen-Hsiu, T. (2007). Mortality salience, self-efficacy, and intentions of risk taking of Taiwanese surfers. *Journal of Sport & Exercise Psychology*, 29, 182-183.

Clifford, M.M. (1988). Failure tolerance and academic risk taking in ten-to twelve-year-old students. *British Journal of Educational Psychology*, 58, 15-27.

Clifford, M.M. (1990). Students need challenge, not easy success. *Educational Leadership*, 48, 22-26.

Çepni, S. (2007). *Araştırma ve Proje Çalışmalarına Giriş*. Trabzon: Celepler Matbaacılık.

Çiftçi, S. (2006). *Sosyal bilgiler öğretiminde proje tabanlı öğrenmenin öğrencilerin akademik risk alma düzeylerine, problem çözme becerilerine, erişilerine, kalıcılığa ve tutumlara etkisi*. Yayınlanmamış Doktora Tezi, Selçuk Üniversitesi Sosyal Bilimler Enstitüsü, Konya.

Gallagher, J. J. (1990). Editorial: The public and professional perception of the emotional status of gifted children. Journal for the Education of the Gifted, 13, 202-211.

Karasar, N. (2005). *Bilimsel araştırma yöntemi*. Ankara: Nobel Yayın Dağıtım.

Korkmaz, H. (2002). *Fen eğitiminde proje tabanlı öğrenmenin yaratıcı düşünme, problem çözme ve akademik risk alma düzeylerine etkisi.* Yayınlanmamış Doktora Tezi, Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.

Little, H. (2006). Children's risk-taking bahaviour: Imlications for early childhood policy and practise. *International Journal of Early Years Education*, 14, 141-154.

Mark, A. R. (1994). *Problem Finding, Problem Solving and Creativity,* New Jersey, Ablex Publishing Corporation Norwoord.

Martin, A.M. (2006). Risk taking behaviours within sexual health. *Primary Health Care*, 16, 31-34.

McGowan, J.J. (2007). Swimming with sharks: Perspectives on professional risk taking. *Journal of the Medical Library Association*, 95, 104-113.

Polya, G. (1981). *Mathematical Discovery,* New York, Chichester Brisbone Toronto.

Rosenbloom, T. (2003) Risk evaluation and risky behavior of high and low sensation seekers. *Social Behavior and Personality,* 31, 375–386.

Sarı, H. (1998). *Lise Yöneticilerinin Sorun Çözmede Yaratıcılığı,* Kocaeli: Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü (Yayımlanmamış Yüksek Lisans Tezi).

Yıldırım, K., *Tay, B.* & Ateş, S. (2007). *Sınıf Öğretmeni Adaylarının Akademik Risk Alma Düzeylerini Belirlemeye Yönelik Betimsel Bir Çalışma.* 16. Eğitim Bilimleri Kongresi, Gaziosmanpaşa Üniversitesi. (sözlü bildiri). (Bildiri Özetleri Kitabı: sayfa: 338)

Yaman, S. (2003). *Fen bilgisi eğitiminde probleme dayalı öğrenmenin öğrenme ürünlerine etkisi*. Yayınlanmamış Doktora Tezi, Gazi Üniversitesi Eğitim Bilimler Enstitüsü, Ankara.