

A NEW COURSE DESIGN ENHANCED WITH ANDRAGOGICAL PRINCIPLES*

Dr. Gülden AKIN
Turkish National Police Academy
Ankara- TURKEY

Dr. Serap KARABACAK AŞIR
Ministry of National Education
Ankara- TURKEY

ABSTRACT

Traditionally in pedagogy, children are learning dependently, learning activities are arranged by teachers, information is transferred from teacher to student and teachers are the only source of authority. Therefore, pedagogy needs some new supplementary approaches. Children, nowadays, reach independent learner level at an earlier stage. At this point, andragogical principles can offer some new solutions. Although it is assumed that andragogy deals with adults, actually the main point in andragogical learning process is the consciousness level of learners but not their ages. Thus, andragogy can be implemented to every age level.

Researches show that adults wait for their teachers' approval during the learning processes. They are conditioned doing so because of their pedagogical formal education experiences. In a pedagogical environment, students' sense of wonder is oppressed under the situations where information is transferred from teacher to student without questioning and criticizing. In order to eliminate these shortcomings in pedagogy, andragogy proposes independent and self-directed learners with its six principles.

In formal education enhanced with andragogical principles, children learn issues by relating with their lives, focus on lifelong learning and take their performance as a criteria in the evaluation level. The authority held only by teacher is shared with students. Teacher becomes participatory, collaborative and negotiator while s/he changes his/her role from information transmitter to problem solver. Accordingly, both teacher and students have new roles in such an educational process.

This study aims to represent the effects of andragogical principles in primary school level. The sample of the research consists of 168 students of 8th grade. Students are asked whether they are ready for the process enhanced with andragogical principles and andragogy can contribute anything to their school success. The results of survey reveal that with an 'Agree' point scale, students are ready for an education program enhanced with six basic andragogical principles.

Key Words: Andragogy, Pedagogy, New Course design.

INTRODUCTION

Throughout history, both education and learning have been defined in different ways by numerous researchers. Ciceron defines education as "the art of transforming a child into a person ". Emile Durkheim described education as "influence of educated generation on the growing generations". (Cit: Sönmez, 2010).

* This study is an improved and expanded version of the research "A New Student and Teacher Model Enhanced by Andragogical Principles" which was presented at 1st International Symposium on the Sociology of Education, Faculty of Education, Ankara University, May 10-11, 2012.

Mazur (1990) defines learning as the permanent changes that occur in individuals by experience. Slavin's (1997) definition of learning is all kinds of skills that are not acquired innately. Senge (1996) states that learning is a set of changes in behavior and ideas which makes people can do the things that they are not able to do in advance. Both education and learning are open to redefine again and again. After all, human beings have always been engaged in education and learning, and it seems they will always be.

Pedagogy, which is the mere concept that comes to mind when one thinks of the concept of education, was developed in the monastery schools between the seventh and twelfth centuries. It is thought to be a field that can answer to the question of how learning and education should occur (Holmes and Abington-Cooper, 2000). The concept is a combination of words 'paid', which means 'child' in the ancient Greek language, and 'agogus', which means 'managing or training' in the ancient Greek. Accordingly, pedagogy can be defined as 'the art and science of children's education' (Knowles, 1977). The most prominent feature of pedagogy is to be a teacher-centered system. Therefore, in a pedagogical educational system, education and training activities are planned by the teacher and s/he is regarded as a source of knowledge, authority and power. Children's experience is not a key point in the educational process. Students are involved in the education process entirely dependent on the teacher about what to learn, how to learn and when to learn. Furthermore, in an education system that is dominated just by pedagogy, students' learning method is perceived as memorization and / or recalling in general. In this traditional system, evaluation of the students is only carried out by teacher as well. (Smith and Waller, 1997).

Conner (2008) states that, in the school system of the ancient times, teacher-centered structure was not available. She also emphasizes that students used to contribute to the formal education process. Former system was disrupted with the opening of the school of priests, since the idea was to teach only desired issues for the sake of remaining and keeping students as pure and clean. In the following centuries, the schooling system has adapted priest school system and formal education system has founded on this idea. However; pedagogy has some shortcomings for students, because even the best-intentioned teachers could suppress inherent sense of wonder of students by taking control of the learning environment. To handle with the deficiencies of pedagogy, andragogy offers some new principles and methods to the formal educational system.

Conner (2008) expresses that implementation of the andragogy to formal education is significant because of the reasons as follows:

1. Learners should know why it is important to learn the subject.
2. Learners should be educated how to be directed to the knowledge.
3. The target topics should be related to students' interests.
4. Human beings cannot learn without being ready and motivated.
5. Teachers should help students to change their prejudices, beliefs and attitudes towards learning.

Knowles (1977) defines the concept of andragogy- by the help of the definition of pedagogy- as the art and science of adult education. Forasmuch, 'andra' meaning 'adult (male)', and 'agogus' meaning 'educate or manage' in the ancient Greek are the words that form the concept of andragogy. The most important feature of andragogy is to be student-centered and the students are independent learners. In this regard, andragogical education system has features such as valuing students' experience in an educational environment, sharing of power and authority between teacher and students, revealing the knowledge not by rote but in relation to the life.

Knowles (1996)states that andragogy is based on six fundamental principles:

1. The learner's need to know. Before attempting to learn anything, adults need to know why they should learn it. When adults undertake the responsibility of learning for themselves, they spend time and energy to examine both the benefits of what has been learnt and the negative consequences if they do not learn.

2. Self-conception of the learner. Adults have a self-perception as to be responsible for the decisions they make in their lives. They show resistance when they feel that others obstinately insist their requests on them.
3. Prior experience of the learner. Comparing to children, adults attend to an educational activity with a larger and more diverse of life experience.
4. Readiness to learn. For the changes they face in their lives, adults are ready to learn anything that they need to know.
5. Orientation to learning. Learning orientation of children and young learners' is subject-oriented. However; learning orientation of adults is life-centered and problem-centered.
6. Motivation to learn. Even if adults are affected by some external motives such as better jobs, promotions and higher wages, they are deeply affected by internal motives such as desire to get job satisfaction, self-esteem and quality of life.

Nowadays, children reach the independent learners' level at an early age when compared to the past. Most young learners want to be involved in the learning process with their own ideas since they are aware of what they need to learn and why they need to learn it (Essex, 2009). Essex proposes that independent learning is not a condition that occurs all of a sudden, once you reach at the age of 18 or 25. Learners are involved in the learning process, gradually get used to the situation and become independent learners. Therefore, it is useful for learners to meet andragogical approach as early as possible to help to conduct their self-evaluation and to become self-directed learners. Otherwise, some students may get stuck in dependent learning. Indeed, studies on adults show that adults wait for the approval of their teachers during a learning process because the education system they have gone through has taught them to do so. Thus, andragogy is required to be implemented to the formal education system since adults should act as independent learners during their adulthood learning process (Essex, 2009).

It can be inferred from the related literature above that andragogical approach and its principles should not be trapped only in adult education but they can also be applied to primary, secondary and higher educational levels. Therefore, an education program enhanced with andragogical principles can be implemented to every formal educational level. Even if some research and observations support this claim factually in English literature, it is really a rare situation to find any research or observations to support this claim factually in Turkish literature. In this context, the problem of this research is to examine whether the primary 8th grade students are ready for an educational system which is enhanced with the andragogical principles and whether this kind of educational system could positively affect their academic achievements and their interests in classes on the basis of their views.

Purpose of the Research

The purpose of this study is to determine the views of 8th grade primary school students about a new course design based on six core andragogical principles along with pedagogy. For this purpose, the following questions are answered:

1. What are the views of students on the effects of compliance with '*need to know*' principle of andragogy?
2. What are the views of students on the effects of compliance with '*self-conception*' principle of andragogy?
3. What are the views of students on the effects of compliance with '*prior experience*' principle of andragogy?
4. What are the views of students on the effects of compliance with '*readiness to learn*' principle of andragogy?
5. What are the views of students on the effects of compliance with '*orientation to learning*' principle of andragogy?
6. What are the views of students on the effects of compliance with '*motivation to learn*' principle of andragogy?

Motivation of the Research

Children are educated in a system that pedagogical principles are constantly at the forefront. A higher level of success and interest can be achieved in a new model of education. In this regard, a new pedagogical education system enriched with andragogical principles might be useful and create a solution to fight with issues such as students' academic failure and dropping out of the school.

Limitations

This research is limited with,

1. 168 primary 8th grade students who attend schools in Mamak district of Ankara province in the spring semester of 2011-2012 academic year.
2. assessments of students' principles of andragogy.

METHODOLOGY

Research Design

In this study, descriptive model is used to evaluate the views of primary 8th grade students. It is tried to be found out whether they are ready an educational program enhanced with the principles of andragogy. In a descriptive model; events, objects, entities, organizations, groups and various fields are tried to be described. These studies are also called as 'survey' and they are conducted on a large number of objects or subjects in a given period of time. Therefore, understanding and grouping both objects and subjects better, determining the relationship between them can be achieved. (Kaptan, 1998).

Participants

The population of the research is Mamak district of Ankara. Sample-taking application method is used owing to the density of population. Sampling is concerned with the selection of a subset of individuals from within a [statistical population](#) to estimate characteristics of the whole population. [Acceptance sampling](#) is used to determine if a production lot of material meets the governing [specifications](#). Two advantages of sampling are that the cost is lower and data collection is faster than measuring the entire population (Yazicioğlu and Erdoğan, 2004).

The sample participants of the research are 168 primary 8th grade students who attend schools in Mamak district of Ankara in the spring semester of 2011-2012 academic year.

Data Collection and Analysis

A questionnaire consisting of 25 items is prepared to determine whether students are ready for a new course design enhanced with andragogical principles and to find out their opinions. 6 of the items in questionnaire are about 'need to know' principle of andragogy, 4 of them are about 'self-conception of the learners', 3 of them correspond to 'prior experience of learners', 3 of the items are about 'readiness to learn', 3 of them correspond to 'orientation to learning' and 6 of them are about 'motivation to learn' principle of andragogy. Students were asked to choose one of the five options in the table of items. The following table is used to evaluate the data range.

Table 1: Point Ranges

Options	Points	Point Scale
<i>Strongly Disagree</i>	1	1,00–1,79
<i>Disagree</i>	2	1,80–2,59
<i>Not Sure</i>	3	2,60–3,39
<i>Agree</i>	4	3,40–4,19
<i>Strongly Agree</i>	5	4,20–5,00

A draft questionnaire is applied to 30 students with 28 items to measure its content validity. The results are evaluated with the views of an expert. After this stage, the necessary arrangements are made on the survey and the survey of the sentence converted to 25 items. Then, the questionnaire is applied 168 students who constitute the real samples of the research. The data obtained from questionnaire is analyzed by using frequency and average. The average of each item in the questionnaire and intervals corresponding to the values are determined (Table 1). Subsequently, the results in Table 1 are matched with the points stated in writing and the range of scores in Table 2 are expressed in writing. Since some of the items are not answered by all 168 students who participated in the research, frequency of each item is written separately and the average is taken accordingly.

RESULTS

The results of frequency, average and point range values of primary 8th grade students' views on the new course design enhanced with six basic andragogical principles along with pedagogy are shown in Table 2.

Table 2: Frequency, Average and Point Range Values for Items

ITEMS			
A. Need to Know	FREQUENCY (f)	AVERAGE (\bar{X})	POINT RANGE (Expression)
1. Before lecturing the lesson, teachers explain in detail why I should learn the topic.	168	3,26	Agree
2. I believe that I only learn lessons to be successful in the exams.	168	2,607	Not Sure
3. I believe that before starting to lecture, if I have been informed why I need to learn the topic, I will be more successful.	168	3,77	Agree
4. I believe that if I have been informed about the benefits after learning the topic, I will be more interested in the lessons.	168	4,34	Strongly Agree
5. Knowing how to apply the topics I've learnt in the class into my everyday life will have positive influence on my learning.	168	4,17	Agree
6. Knowing the fact that the courses I have been taking will contribute to my future career will improve my performance.	168	4,23	Strongly Agree
<i>Average</i>		<i>3,72</i>	<i>Agree</i>
B. Self-conception of the Learner			
7. I believe that if I take responsibility during the activities in class, it will increase my interest in lessons.	168	3,303	Not Sure
8. Participating in classes actively will improve my performance.	168	4,38	Strongly Agree
9. Doing extra studies by not only depending what teachers have taught during the lessons will have positive impact on my learning performance.	168	4,011	Agree
10. Doing more deeply researches about the issues I have learnt in the class will increase my	168	3,75	Agree

interest in lessons.			
<i>Average</i>		3,86	<i>Agree</i>
C. Prior Experience of the Learner			
11. If the examples given about the subjects could be related to my own life, it will have positive impact on my learning performance.	168	3,92	Agree
12. I believe that classes will be more useful if I am allowed to discover my traits during the lessons.	167	3,75	Agree
13. If I feel that I and my experiences are valued in the lessons, my learning performance will improve.	168	3,5	Agree
<i>Average</i>		3,72	<i>Agree</i>
D. Readiness to Learn			
14. I am not sure whether I am ready to understand all the issues that are lectured in the lessons.	168	2,99	Not Sure
15. Before starting a new and difficult topic, if the teacher links it with the topics that I learnt before, my learning performance will improve.	168	3,98	Agree
16. If I apply the topics I learnt into my everyday life, it will have positive effect on my learning.	168	3,91	Agree
<i>Average</i>		3,62	<i>Agree</i>
E. Orientation to Learning			
17. If I learn anything that will help me in my daily life, I will be more successful.	167	3,98	Agree
18. Before starting to lessons, if I am asked what I need to learn, my learning performance will improve.	166	3,86	Agree
19. To explain the problems that I encounter during the course and to find solutions to them with my friends and teachers will have positive effect on my learning performance.	166	3,92	Agree
<i>Average</i>		3,92	<i>Agree</i>
F. Motivation to Learn			
20. Instead of memorizing, recalling-learning by associating the issues with my own life will have positive effect on my performance.	165	3,75	Agree
21. If my opinions are asked about the lecturing method of the lessons, it will increase my interests in lessons.	165	3,79	Agree
22. Sharing of authority in the classroom between teacher and students will increase my interests in lessons.	165	3,87	Agree
23. If my opinions are asked about the methods of assessments at the end of level tests, it will increase my interest in lessons.	163	3,73	Agree

24. If I know how the exams will be conducted, I will able to learn the topics better.	165	3,89	Agree
25. If I believe that my contribution to the lessons is valued, I will be more interested in lessons.	166	4,01	Agree
<i>Average</i>		<i>3,84</i>	<i>Agree</i>

The data above in Table 2 are analyzed with corresponding to each sub-objective of the research.

What are the views of students on the effects of compliance with 'need to know' principle of andragogy?

Students are known to be more successful and more interested in lessons if they are informed in detail why they need to learn the target topic (Knowles, 1996). As shown in Table 2, the first part of the questionnaire is intended to research this assumption. This section as called 'need to know', which is composed of six items, is answered by all 168 participant students.

Students state that if they are informed what will be the benefits of the topics they have learnt, they will be more interested in lessons and therefore they can be more successful. This item has the highest average in the 'need to know' section of the questionnaire. Students believe that if they know that the courses they are dealing with during the academic year are related to their future careers, this can be a factor to increase their interests in lessons.

In the 'need to know' section, the item which has the lowest average is the second sentence which asks students' views about the current educational system. Students are not sure whether they are studying for classes just to pass the exams or not. Therefore, the students' attitude for studying is not only to be successful in the exams but other variables also affect them. In this case, the students can be commented not to be dependent learners on exams. They, as being independent learners, take into account the benefits of the topics they have been learning in lessons.

By looking at the overall average of this section, it can be concluded that students have positive attitudes towards the 'need to know' principle of andragogy. Average of this section is 3,72 out of 5 points and it corresponds to the point range of 'Agree'.

What are the views of students on the effects of compliance with 'self-conception' principle of andragogy?

According to self-perception principles of andragogy, learners want to take responsibility for the issues they have been learning. Learners do not want third parties to impose their will on them (Knowles, 1996). In this respect, by looking at the answers of the second part of the questionnaire, students are observed to be undecided about whether they want to take responsibility in the educational environment or not. Therefore, 3,3 out of 5 points which is the average of the seventh sentences, corresponds to the point range of 'Not Sure'. In contrast, students strongly believe that their success in the class will increase if they actively participate in the lessons. In addition, students want to conduct extra researches out of the classes which are related to the topics they have learnt in the class. They believe that this situation will affect their achievement positively.

As shown in Table 2 and understood from the comments above, students are willing to participate in activities and conduct research on their own. However, they are not sure about taking responsibility for their learning. It can be interpreted that either students are not ready to take responsibility or they do not have enough confidence for taking responsibility.

It can be concluded from principle of 'self-concept of learners' that the point range corresponds to 'Agree' with the average of 3,86 out of 5. Therefore, primary 8th grade students' view on the self-concept principle of andragogy is positive.

What are the views of students on the effects of compliance with 'prior experience' principle of andragogy?

It is an undeniable fact that comparing to children, adults involve in the educational environments with more various, different and deeper experiences. Nevertheless, it does not mean that because children have lived shorter than the adults, their experiences are not welcomed or respected in the educational environment. Regardless of their age, that is whether they are adults or children, it is important to make learners feel that they are valuable.

As shown in Table 2, students made positive comments on relating the subjects they have learnt in an educational environment to their lives, giving examples connected with the events they have experienced in their lives, having the opportunity to get to know themselves better with the given examples and being appreciated about their experiences. Students believe that such applications in an educational environment will increase their interests and success.

Nowadays children compared to previous generations have much more experiences in early ages especially by the help of technology. Thanks to virtual environment, advanced technology and wide communication nets, they have knowledge about anything they want. Thus, students' expectation of being respected for themselves and their accumulations are natural consequences. Knowles (1977) states that an educational environment in which students' lives are being taken into consideration will also flourish students' interests in lessons.

What are the views of students on the effects of compliance with 'readiness to learn' principle of andragogy?

Adults prefer to participate in an educational environment when they feel ready to learn. Regardless of their readiness, children are participated in educational environment. Because it is the learners' age that counts for the formal education, it is only the children's age that is taken into consideration. But it does not mean that students' opinions about their readiness towards to learning subjects should not be asked. Essex (2009) points out that when compared to their peers in previous times, young learners reach the independent learner level at an earlier age and they want to take part in deciding stage related to their education process.

As it resulted in Table 2, before starting a new and difficult subject, students want their teachers to connect the new subjects with previous ones in order to feel much more ready. Moreover, students express that when they have an opportunity to put the subjects they learnt before into practice they feel much more ready to learn the new subjects.

In this section, the item which students are not sure about is to be ready or not to understand all the subjects in a lesson. Therefore, there are students who are hesitant about being ready to understand all the subjects in a lesson, yet there are also students who feel themselves completely ready to learn.

The general average of students' answers is 3,6 out of 5 which is equivalent to "Agree" point range. Bearing this in mind, it may be concluded that there are not any negative comments related to 'readiness to learn' principle of andragogy in general.

What are the views of students on the effects of compliance with 'orientation to learning' principle of andragogy?

According to 'orientation to learning' principle of andragogy, adults do not make any efforts to learn a subject just for the sake of being motivated. They have problems that they cannot solve in their lives and they believe that it can only be overcome by education. Therefore, adults' tendency towards learning is problem-based. In education of children, it is not likely to plan all of the subjects in order to solve the problems they face in their lives. Yet, it is possible to make a plan by identifying the subjects which are potentially higher than children come up against. The problems they face do not have to be related to only their lives. Sharing the problems they come up against when they are learning and trying to find a solution to this problem with his / her teacher and friends are related to principle of 'orientation to learning', as well.

As shown in Table 2, students believe that being taught the subjects they need in daily life, being asked their necessities before starting the lesson and trying to find solutions together to the problems they come up against during the lesson might increase their success. Consequently, students do not have any negative tendency towards to principle of 'orientation to learning'.

What are the views of students on the effects of compliance with 'motivation to learn' principle of andragogy?

According to principle of 'motivation to learn', the more the learners participate in a learning environment, the more interested they are in. This situation is acceptable for both adults and children. Knowles (1996) points out that learners motivate their energy upon learning as much as they make their learning process a part of their lives. Including children in the planning, teaching and evaluation process of courses will increase students' interests, since students' views about the motivation items are positive in the questionnaire. In this regard, students want to be asked their opinions on how the lessons are to be lectured, want teachers not to be the sole authority in the class but sharing it between the teacher and the students and be asked their opinions on how to conduct the examinations.

The general average of students' answer is 3,84 out of 5 to the 'motivation to learn' principle of andragogy, which is equivalent to "Agree" in point range in Table 1.

DISCUSSIONS AND SUGGESTIONS

The survey conducted to 8th grade students reveals that students are ready for an education program enhanced with andragogical principles. In this respect, it is concluded that the average of each andragogical principle is close to each other, because the average of all of the sections is equivalent to 'Agree' point range.

By looking at the survey in general, it is observed that 3 items are responded as 'Not Sure', 3 items 'Strongly Agree', and 19 items 'Agree'. The principle of 'orientation to learn', is the highest one with an average 3,92 among all six principles. Students want to be asked their opinions about the subjects they need to learn and to be taught the subjects they need. The principle which students answered with the lowest average is 'readiness to learn'. In this section, students responded to the statement "I am not sure whether I am ready to understand all the issues that are lectured in the lessons." as "Not Sure". This item decreases the average of the section. However, students feel themselves ready to learn and understand the subjects since the total average of the section is 3,62 out of 5.

The suggestions derived from the information based on this research as follows:

- When preparing the annual education plan and/or unit plans, a section could be included that gives some information and examples about which unit topic is related to which professional field.
- At the beginning or at the end of each unit, some clues could be included about how students can use those issues in their daily lives.
- At the end of each academic year, learners' needs-analysis can be applied for each course separately. Therefore, it can be figured out which topics students are in need of learning for the next year. This analysis can be both out of new topics and the topics that students have had difficulty to understand throughout current academic year, so they can be lectured in a different method for the coming year.
- In addition to learners' needs-analysis, case-detection analysis could be applied while students continue their education during the academic year. In this regard, the learning process can be enriched with the views and wishes of the students.
- Seminars may be held to host professionals so that they can emphasize what benefits they have had in their professional lives from the topics they learnt in primary school. Hence, students' interests in lessons can be flourished.

- At the end of the units, some clues can be given about how students can deepen their researches on the topics they have learnt in the classes.
- The role of the teacher, as being the absolute source of power and authority, is needed to be changed. This objective can be achieved by carrying out studies to redeploy both physical and psychological environment, as well as in-service training.

BIODATA AND CONTACT ADDRESSES OF AUTHORS



Gülden AKIN is a graduate of Faculty of Education, Boğaziçi University, Turkey. She received her MA on Adult Education, Institute of Education at Marmara University. She completed her PhD at Ankara University, Institute of Education, Lifelong Learning and Adult Education Program. She has been working at Turkish National Police Academy as an instructor since 2007. Her research interests include andragogy, adult education, mobbing, preparing andragogical programs for learners, foreign language acquisition of adult learners and ESP. She is married with a son.

Dr. Gülden AKIN
Turkish National Police Academy
Ankara-TURKEY
E. Mail: akingulden@gmail.com



Serap KARABACAK AŞIR is a graduate of Faculty of Languages, History and Geography, Department of Ethnology at Ankara University, Turkey. She received her MA at Institute of Social Sciences, Ankara University. She completed her PhD at Ankara University, Institute of Education, Lifelong Learning and Adult Education Program. She is a teacher and her research interests include gender issues in Turkey, mobbing, adult education and comparing educational programs of children and adults. She is married with two daughters.

Dr. Serap KARABACAK AŞIR
National Ministry of Education
Ankara, TURKEY
E. Mail: novasera@yahoo.com

REFERENCES

- Conner, M. (2008). 'Further Contrasting Andragogy and Pedagogy'. *AgeLess Learner*. Retrieved 11. 11.2009 from <http://gamingandlearning.wordpress.com/2008/04/17/pedagogy-andragogy-its-not-the-technology>.
- Essex, G. (2009). 'What Constitutes an Adult?'. *Teaching Transformation*. January 22, 2009. Retrieved 11. 11. 2009 from <http://facilitatelearning.blogspot.com/2009/01/what-constitutes-adult.html>.
- Holmes, G. ve Abington-Cooper, M. (2000). Pedagogy vs. Andragogy: A False Dichotomy? *The Journal of Technology Studies*, 26(2). Retrieved 15.11.2011 from <http://scholar.lib.vt.edu/ejournals/JOTS/Summer-Fall-2000/holmes.html>.
- Kaptan, S. (1998). *Bilimsel Araştırma ve İstatistik Teknikleri*. Ankara: Tekişik Ofset.

- Knowles, M. (1977). *The Adult Education Movement in the United States (Revised Edition)*. Malabar, FL: Krieger.
- Knowles, M. (1996). *The adult learner: A neglected species*. (Trans.: Serap Ayhan). A. Ü. Basımevi, Ankara.
- Mazur, J. E. (1990). *Learning and Behaviour*. (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Senge, P. (1996). *Beşinci Disiplin*. (Trans.: Ayşegül İldeniz ve Ahmet Doğukan), İstanbul: Yapı Kredi Yayınları.
- Slavin, R. E. (1997). *Educational psychology: Theory and Practice*. Boston: Allyn & Bacon, Fifth Edition.
- Smith, K. A.; Waller, A.A. (1997). *New Paradigms for Engineering Education*. ASEE/IEEE Frontier in Education Conference.
- Sönmez, S. (2010). *Eğitilme Arzusunun Yüceliği, Eğıtilmeme Özgürlüğünün Saçmalığı*. Retrieved 15.11.2011 from <http://e-dergi.atauni.edu.tr/index.php/GSED/article/viewFile/2308/2315>
- Yazıcıoğlu, Y. ve Erdoğan, S. (2004). *Spss Uygulamalı Bilimsel Araştırma Yöntemleri*. Ankara: Detay Yayıncılık.