

# **COMPUTER PERCEPTIONS OF SECONDARY SCHOOL TEACHERS IN TURKEY**

## **INTRODUCTION**

Advances in technology have caused vital changes in many domains of societal and individual life. In education, technologies are promising in terms of promoting student-centered teaching and more active involvement of the student in the learning process (Scheffler & Logan, 1999). For the educational system to benefit from these advances in an optimum way, both the technological infrastructure and its implementers, the teachers, need to be taken into consideration (Erkan, 2003). A school with an adequate technological base may not be able to integrate technology within its curricula if the teachers do not possess a positive attitude. The teacher factor is found to be often overlooked by many school administrators (Arslan, 2003). A number of previous research conducted in different countries on teacher attitudes toward technology and computers revealed positive attitudes (Çağiltay, Çakıroğlu, Çağiltay, & Çakıroğlu, 1998; Hong & Koh, 2002; Ng & Gunstone, 2003).

To control for the insufficient technological equipment variable, we selected Anatolian High Schools (AHSs) as the sites of the study, which are prominent schools in Turkey with adequate educational technology base. In this context, the purpose of our study was to explore secondary school teachers' perceptions of computers and their use in education. We also aimed to understand if there were any relationships between the different subscales of teacher perceptions such as technological affinity and aversion. Additionally, we looked for relationships among the demographic variables. Finally, we explored any differences in perceptions based on demographic variables such as age, gender, field of teaching, and computer experience such as training, computer and Internet ownership.

## **METHODOLOGY**

### ***Study Design***

We employed survey research methodology to understand AHS teachers' distribution on demographic variables and their computer and technology perceptions. Cross-sectional survey was employed to collect information at one point in time (Fraenkel and Wallen, 2003) over four weeks from teachers in various fields. We were primarily concerned with what the distribution was rather than why the distribution existed.

### ***Instrumentation***

Our survey instrument was comprised of Loyd and Gressard's (1984) Computer Attitude Scale (CAS) version with 40 items, validated in Turkish by Berberoğlu and Çalikoğlu (1992), and Hogarty, Lang and Kromrey (2003)'s Technological Aversion, Technological Affinity, and Confidence and Comfort scales consisting of a total of 28 items.

All of the items from the four scales were rated by the study participants using five-point Likert scale, ranging from "definitely agree" to "definitely disagree." Cronbach's Alpha reliability coefficients were computed for the internal consistency of the scales and found to be ranging from 0.73 to 0.90, demonstrating acceptable reliability levels.

### ***Context of Study***

Anatolian High Schools are public high schools in Turkey that are among the few school types most successful in terms of student achievement and graduates' entrance to college. Students are selected to AHSs by a central nationwide examination upon completion of middle school (Grade 8). Teachers are also selected for teaching at AHSs based on criteria of having previous teaching experience of at least three years, a competitive examination and an interview.

### ***Survey Participants***

The sample consisted of 76 female (58.5%) and 54 male (41.5%) AHS teachers. Forty five of them (34.6%) were in the science/mathematics field, 26 (or 20%) in the social sciences, 36 (or 27.7%) in literacy, four teachers in physical education and six teachers in arts/music. Mode of age range was found to be 31-35, and 46.2% of the teachers were 35 years old or younger. Only five of the teachers had teaching experience of 2-5 years with the rest having experience more than that.

## **DATA ANALYSES AND FINDINGS**

Likert data were scored with a five-point scale. For all of the items in the four scales of the survey, the response “strongly disagree” was scored as 1, while the response “strongly agree” was scored as 5. We also had an option of “not sure” response which was scored as 3. The range for possible scores was 1 - 5.

Prior to analyses directed towards revealing relationships among scale variables, normality checks were performed for each of the scales. According to the Kolmogorov-Smirnov tests performed, all four scales showed normal distribution of data ( $p > 0.05$ ). Thus, parametric tests could be utilized in further analyses. General Linear Model and subsequent relationship analyses were performed to understand

effects of the independent variables and differences in terms of the dependent variables emerging from the perceptions instrument.

### ***Relationships between Demographic Variables***

The teachers who owned a personal computer were significantly more likely to have computer experience at higher levels ( $X^2_{(6)} = 16.370$ ,  $p = 0.012$ ,  $\Phi = 0.36$ ) than those who did not. Also, there was a significant relationship between computer ownership and computer training received. Computer owners appeared to have had more training desirable for utilizing computers in education ( $X^2_{(3)} = 9.729$ ,  $p = 0.021$ ,  $\Phi = 0.28$ ). The extent to which the teachers had computer experience and training seemed to depend on their computer ownership.

Computer experience and computer training also differed significantly in terms of the variable age. The teachers between ages 31-40 were more likely to use computers in their classrooms ( $X^2_{(30)} = 101.350$ ,  $p < 0.005$ ,  $\Phi = 0.89$ ). Teachers at age 41 and over mostly used application software and wanted to learn more about computers. As age increased the number of teachers having received training on using computer applications and integrating computers in their teaching, decreased ( $X^2_{(15)} = 27.768$ ,  $p = 0.023$ ,  $\Phi = 0.46$ ).

### ***Computer Attitudes, Technological Affinity and Aversion, Confidence and Comfort***

AHS teachers' overall attitudes toward computers and technology were found to be positive ( $M = 3.69$ ), with 73.8% of the teachers having attitude scores above the "not sure" range (Table). The teachers scored highest on the Technological Affinity scale ( $M = 3.90$ ). The mean score for the Confidence and Comfort scale (3.41) was found to be in the "not sure" range and less than half of the teachers

agreed or strongly agreed that they were confident and comfortable in using computers and technology. The higher standard deviation score for this scale implied higher perception variability in terms of confidence and comfort.

Table. *Descriptive scores for the four scales.*

							<i>Respondents with M &gt; 3.44</i>
<b>Scale</b>	<b>Minimum</b>	<b>Maximum</b>	<b>M</b>	<b>SD</b>	<b>n</b>	<b>%</b>	
Computer Attitudes	2.35	4.60	3.69	0.43	96	73.8	
Technological Affinity	2.50	4.90	3.90	0.55	108	83.1	
Technological Aversion	1.00	3.56	2.09	0.53	1	0.8	
Confidence and Comfort	1.11	5.00	3.41	0.73	51	39.2	

***Relationships among Computer Attitudes, Technological Affinity and Aversion, Confidence and Comfort***

Bivariate correlation analysis based on the Pearson product-moment coefficient demonstrated that positive Computer Attitudes corresponded to higher Technological Affinity, higher Confidence and Comfort, and lower Technological Aversion scores, as would be expected. Significant positive correlations were also found between Technological Affinity and Confidence and Comfort, and Technological Aversion was negatively correlated with these two scales at 0.01 significance level.

### *Differences in Computer Attitudes, Technological Affinity and Aversion, Confidence and Comfort based on Demographics*

General Linear Model analysis of data was performed to explore any significant effects of demographic characteristics on the perceptions scores. Multivariate tests revealed significant effects of computer experience, computer training, gender, field of teaching, an interaction effect of Internet connection availability and field, on one or more of the dependent variables. Further, to understand the direction of the relationships or the differences between the means of the demographic variable categories in terms of computer perceptions, correlational and mean differences analyzes were performed.

## **DISCUSSION**

Findings of this study reveal that computer ownership is an important predictor of higher level computer experience and training. The teachers who had personal computers also were more likely to have computer experience in using application software, and in using computers for teaching in their classrooms. Although AHSs had adequate technological infrastructure and the teachers had access to computers during school time, this finding suggested that it was in fact the personal computer ownership that related to computer experience and training. Based on our experiences in the schools, getting busy with lesson planning or other duties during school time may constrain the teachers' interactions with the school computers.

Apart from computer ownership, age also appeared to have a relationship to computer experience and training. The teachers between ages 31-40 were more likely to use computers in their classrooms and the teachers over 40 wanted to learn more about computers or mostly used application software. On the other hand,

younger teachers appeared to be more willing to adopt educational technologies.

Findings also suggest that the teachers with no or basic computer literacy training significantly differed from their counterparts in terms of computer attitudes, affinity and confidence and comfort. Training was another important factor that affected teacher perceptions as also supported by the existing literature (Badagliacco, 1990; Levin and Gordon, 1989).

## **CONCLUSIONS AND IMPLICATIONS**

Integrating technology and education can enhance teaching and learning activities in ways that can support student-centred teaching (Alexander, 1999; Beal, 2000; Cajas, 2001; Cope & Ward, 2002; Edelson, 2001; Jarvela, Bonk, Lehtinen, & Lehti, 1999; Jonassen, Hernandez-Serrano, & Choi, 2000; Lancashire, 2000). Investigation of teachers' perceptions of computers is rather important in the process of shifting to student-centered computerized education. Results of the current study may be used to inform effective teacher preparation and professional development initiatives concerning computer use in education.

Based on the findings of the current study, and our experiences in the AHSs we have made a number of practical recommendations to encourage teachers to integrate computers and technology in their teaching activities.

## REFERENCES

- Alexander, J. O. (1999). Collaborative Design, Constructivist Learning, Information Technology Immersion, & Electronic Communities: A Case Study. Retrieved 15 February, 2002, from <http://jan.ucc.nau.edu/~jpct-j/1999/n1-2/alexander.html>
- Arslan, B. (2003). Bilgisayar destekli eğitime tabi tutulan ortaöğretim öğrencileriyle bu süreçte eğitici olarak rol alan öğretmenlerin BDE'e ilişkin görüşleri. *The Turkish Online Journal of Educational Technology*, 2(4), 1303.
- Beal, M. (2000). Teaching with technology: Constructivism at work. In L. Lloyd (Ed.), *Teaching with Technology: Rethinking Tradition* (pp. 127-132). Medford, NJ: Information Today, Inc.
- Berberoğlu, G., & Çalikoğlu, G. (1992). Türkçe bilgisayar tutum ölçeğinin yapı geçerliliği. *Eğitim Bilimleri Fakültesi Dergisi (Ankara Üniversitesi)*, 24(2).
- Çağiltay, K., Çakıroğlu, J., Çağiltay, N., & Çakıroğlu, E. (1998). Öğretimde bilgisayar kullanımında öğretmen görüşleri. Retrieved 07 December, 2006, from [www.metu.edu.tr/~kursat/jenk\\_hu\\_makale.doc](http://www.metu.edu.tr/~kursat/jenk_hu_makale.doc)
- Cajas, F. (2001). The science/technology interaction: Implications for science literacy. *Journal of Research in Science Teaching*, 38(7), 715-729.
- Cope, C., & Ward, P. (2002). Integrating Learning Technology Into Classrooms: The Importance of Teachers' Perceptions. *Educational Technology & Society*, 5(1), 67-74.
- Edelson, D. C. (2001). Learning-for-use: A framework for the design of technology-supported inquiry activities. *Journal of Research in Science Teaching*, 38(3), 355-385.
- Erkan, S. (2003). Öğretmenlerin bilgisayara yönelik tutumları üzerine bir inceleme. Retrieved 06 December, 2006, from <http://www.manas.kg/pdf/sbdpdf12/Makaleler/12.pdf>

- Hogarty, K. Y., Lang, T. R., & Kromrey, J. D. (2003). Another look at technology use in classrooms: The development and validation of an instrument to measure teachers' perceptions. *Educational and Psychological Measurement*, 63(1), 139-162.
- Hong, K. S., & Koh, C. K. (2002). Computer anxiety and attitudes toward computers among rural secondary school teachers: A Malaysian Perspective. *Journal of Research on Technology in Education*, 35(1), 27-48.
- Jarvela, S., Bonk, C. J., Lehtinen, E., & Lehti, S. (1999). A theoretical analysis of social interactions in computer-based learning environments: Evidence for reciprocal understandings. *Journal of Educational Computing Research*, 21(3), 363-388.
- Jonassen, D. H., Hernandez-Serrano, J., & Choi, I. (2000). Integrating Constructivism and Learning Technologies. In J. M. Spector & T. M. Anderson (Eds.), *Integrated and Holistic Perspectives on Learning, Instruction and Technology* (pp. 103-128). Netherlands: Kluwer Academic Publishers.
- Lancashire, R. J. (2000). The Use of Internet for Teaching Chemistry. *Analytica Chimica Acta*, 420, 239-244.
- Ng, W., & Gunstone, R. (2003). Science and computer-based technologies: Attitudes of secondary science teachers. *Research in Science & Technological Education*, 21(2), 243-264.
- Scheffler, F. L., & Logan, J. P. (1999). Computer technology in schools: What teachers should know and be able to do. *Journal of Research on Computing in Education*, 31(3), 305.