# ICT IMPLEMENTATION IN THE IRANIAN EDUCATIONAL SYSTEM AND ITS PERCEPTION BY EFL TEACHERS AS A BENEFICIAL TECHNOLOGY

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## Abstract

This study investigated factors that may influence the attitudes towards information and communication technology (ICT) by Iranian teachers of English as a foreign language (EFL). The Diffusion of Innovations (Rogers, 1995) and the theoretical relationship between attitudes and behavior introduced by the Theory of Reasoned Action (Ajzen & Fishbein, 1980) established the theoretical framework. A multi-sections survey in English language was administered to the EFL teachers in the cities of Qazvin, Takestan, Abhar, and Zanjan for the scholastic year 2007–2008. A sample of 120 was utilized. The study showed that Iranian EFL teachers had positive attitudes towards ICT. Iranian EFL teachers' perceptions of ICT attributes from highest to lowest in mean scores were: observability, relative advantage, complexity, and compatibility. Home was the place most EFL teachers had access. It was also found that age and teaching experience had a negative correlation with attitudes, whereas qualification had a positive correlation with attitudes. Of the total variance in Iranian EFL teachers' attitudes towards ICT 67% was explained by the four main independent variables of the study: attributes, cultural perceptions, competence, and access.

## Introduction

According to Rogers (1995), an innovation can be defined as "an idea, a practice, or object that is perceived as new by individual or other units of adoption" (p. 11), and diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 10). The notion of attitudes is central to the concept of adoption, thus, culturally-related perceptions may have a strong influence on attitudes that ultimately lead to adoption decisions. In the context of innovations designed for educational systems, teachers are assumed to be major stakeholders in making such adoption decisions (Spiegel, 2001).

The Theory of Reasoned Action (Ajzen & Fishbein, 1980) asserts that individual behavior is rational and based on a systematic assessment of the information available to them in a certain situation. Thus, an individual's behaviour — in the case of this study, the use or rejection of ICT — is determined by his or her intentions to perform the

behavior, and this intention is influenced jointly by the individual's "attitudes and subjective norms" (Dillon & Morris, p. 6). Attitudes are thought to be composed of cognitive, affective, and behavioral elements. Cognitive refers to the perceptions of the attitude object; affective refers to feelings towards the attitude object; and behavior refers to the response to the attitude object (Ajzen & Fishbein, 1988).

In school settings in developing countries, where teachers effectively function as primary "change agents"(Chin & Hortin, 1994, p. 83), such factors may play a significant role in the extent to which teachers carry out the responsibility of utilizing technology for instructional purposes, and ultimately, for development.

This problem is highlighted by the fact that Iran, as a developing country, has embraced ICT in education as a means to progress and modernization. Despite the importance of both ICT and EFL instruction in all Iranian public and private schools, there is little research specific to the locale to inform such an importance. Thus, two dimensions exist with regard to ICT in Iranian schools: the human factor and the innovation itself.

**Literature Review**
Pelgrum (2001) sought to conduct a comparative international educational assessment of ICT integration that would include contextual factors that might explain the variations among the countries.

Shelly (1998) conducted a study investigating the adoption and use of electronic e-mail by K–12 foreign language teachers. She used Rogers' (1995) five stages of adoption — relative advantage, compatibility, complexity, trialability, and observability. A national study was conducted by Turnbull and Lawrence (2002) in Canada to examine the beliefs, attitudes, and experiences of French second language (FSL) teachers in relation to their use of technology in FSL education.

In 2000–2001, Christensen and Knezek (2001) conducted a study of teachers' attitudes, skills, and access to computer tools in Laredo, Texas. The researchers found that the teachers' competence and confidence in their computer use correlated with their home access. A qualitative study by Granger, Morbey, Lotherington, Owston, and Wideman (2002) explored the implementation of ICT in four public schools in Canada. The purpose of the study was to learn about the factors that contributed to the successful implementation of ICT by teachers in the classroom.

**Definitions of Terms**
**Attitude.** "A psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p. 15). In this study, attitude toward ICT was defined as the degree of favor or disfavor towards the existence of ICT in Iranian schools. It consisted of three components: affective, cognitive, and behavioral (Ajzen & Fishbein, 1980).

**Innovation attributes.** Rogers (1995) has identified five attributes of an innovation which determine the degree of its adoption: (1) relative advantage, (2) compatibility, (3)

complexity, (4) observability, and (5) trialability. In this study, perceived attributes of ICT are operationally defined as the degree of relative advantage, compatibility, complexity, and observability of ICT perceived by Iranian EFL teachers. The fifth attribute, trialability, was not included in the study since EFL teachers in Iran have not had the chance to experiment with ICT before it has been placed in schools by government decree.

**Cultural perceptions.** In this study, cultural perceptions refer to the extent to which Iranian EFL teachers perceive ICT use to be consistent with the cultural context of the Iranian society and public schools.

**Teacher characteristics.** The demographic variables of gender, age, qualifications, school level, teaching experience, computer training.

## Research Questions
1) What are the attitudes towards ICT among Iranian EFL teachers?

2) What are the perceptions of Iranian EFL teachers in regard to:
    ICT attributes?
    cultural perceptions of ICT?
    computer competence?
    computer access?

3) What is the relationship between the attitudes toward ICT among Iranian EFL teachers and their perceptions of each of the independent variables (including teachers' characteristics)?

4) What is the proportion of the variance in the dependent variable (attitudes toward ICT by Iranian EFL teachers) that can be explained by the independent variables?

## Purpose of the Study
The primary purpose of this study was to explore factors that might influence the attitudes towards information and communication technology (ICT) by Iranian teachers of English as a foreign language (EFL). Specifically, the study sought to determine the extent of relationship between the attitudes towards ICT by Iranian EFL teachers and a number of related variables, including the teachers' perceptions of the attributes of ICT, culture-related perceptions of ICT, competence in using ICT, and level of access to ICT, as well as a variety of teacher characteristics, such as demographic characteristics.

## Population
The target population for this study was Iranian EFL teachers in the cities of Qazvin, Takistan, Abhar, and Zanjan. The researcher chose to focus on these cities because they represent the urban side of the provinces in which the ICT infrastructure has been installed more rapidly than other districts and that there is almost a unified system of managing schools in Iran in respect to teachers and their pedagogical  duties. Also, these

cities were more convenient in location to the researcher in terms of access and delivery of the survey.

# Methodology

## Sample

Rea and Parker (1997) have stated that "in certain cases, [as in very small populations]…a sample size of 50 percent of the population size has been determined to provide the required accuracy." (p. 121). Given that the population size for this sample was 240, a sample size of 120 was appropriate for the purposes of this study. The researcher used "a table of random numbers" (Graziano & Raulin, 1997, p. 214) in selecting this sample. Each subject in the population of 240 was assigned a number, and then 120 numbers were selected randomly.

## Instrumentation

The survey, which for the purposes of this study was known as the ICT Survey of EFL Teachers in Iran, contained six sections, each of which represented one of the variables examined in the research questions: 1) Attitudes towards ICT; 2) Perceived Computer Attributes; 3) Cultural Perspectives; 4) Perceived Computer Competences; 5) Perceived Computer Access; and 6) Teacher Characteristics.

## Validity

Face and content validity were established for this instrument with the help of a panel of experts consisting of three psychology experts, two bilingual experts, one measurement expert, and four population experts (Iranian teachers). This panel evaluated the instrument both before and after it was used and necessary modifications were made.

## Reliability

The reliability of this instrument was established using the data from a pilot study that was carried out with 30 subjects in the population. After altering some items, the Cronbach's alpha coefficients for the actual study were verified to be acceptable.

## Data Analysis

The data were analyzed using both descriptive and inferential statistics. Descriptive statistics were used to describe and summarize the properties of the data collected (Gay & Airasian, 2000), and inferential statistics, including both Pearson and Spearman correlations and multiple regression analysis were used to explore relationships between the variables in the study. The Statistical Package for the Social Sciences (SPSS) was used in analyzing the data in order to determine relationships between the independent and dependent variables.

# Results

*Research Question One: What are the Iranian EFL Teachers' Attitudes toward ICT?*

Table 1: Frequency percentages on the Attitude Scale (N = 120)

| Item Computer Attitude Scale | Percent (%) | | | | |
|---|---|---|---|---|---|
| | SD | D | N | A | SA |
| 1   Computers do not scare me at all | 3.3 | 8.9 | 4.4 | 43.1 | 40.3 |
| 2  *Computers make me feel uncomfortable | 37.2 | 41.6 | 6.9 | 11.3 | 3.0 |
| 3   I am glad there are more computers these days | 4.2 | 4.8 | 7.6 | 45.8 | 37.6 |
| 4  *I do not like talking with others about computers | 24.5 | 43.8 | 7.6 | 4.8 | 4.2 |
| 5   Using computers is enjoyable | 1.1 | 5.0 | 4.2 | 53.1 | 36.6 |
| 6   *I dislike using computers in teaching | 24.5 | 44.4 | 16.8 | 10.2 | 4.1 |
| 7   Computers save time and money | .8 | 6.2 | 5.4 | 45.8 | 41.8 |
| 8 *Schools would be a better place without computers | 35.8 | 39.1 | 16.3 | 6.6 | 2.2 |
| 9   Students must use computers in all subject matters | 4.8 | 16.0 | 29.4 | 35.3 | 14.6 |
| 10 *Learning about computers is a waste of time | 52.3 | 36.3 | 7.4 | 1.9 | 1.7 |
| 11 Computers would motivate students to do more study | 3.1 | 8.7 | 24.6 | 45.1 | 18.5 |
| 12 Computers are fast and efficient means of getting information | 1.1 | 3.1 | 3.9 | 41.5 | 50.4 |
| 13 *I would never need a computer in my classroom | 21.2 | 48.2 | 17.9 | 9.6 | 3.0 |
| 14  Computers can enhance students' learning | 2.2 | 5.0 | 13.9 | 62.6 | 16.3 |
| 15 *Computers do more harm than good | 33.9 | 46.0 | 12.4 | 13.8 | 4.1 |
| 16 *I would rather do things by hand than with a computer | 14.6 | 52.9 | 14.6 | 13.8 | 4.1 |
| 17  If I had the money, I would buy a computer | 2.2 | 5.3 | 9.0 | 32.0 | 51.4 |
| 18 *I would avoid computers as much as possible | 36.9 | 47.7 | 7.4 | 5.2 | 2.5 |
| 19  I would like to learn more about computers | 2.5 | 5.0 | 4.2 | 51.8 | 36.4 |
| 20 *I have no intention to use computers in the near future | 39.1 | 43.0 | 9.9 | 3.0 | 5.0 |

Scale: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree

Note: *negative items were reversed before scoring

*Research Question Two: What are the Iranian EFL Teachers' Perception of Factors Related to Attitudes towards ICT?*

Table 2: *Frequency percentages on the Computer Attributes Scale (N = 120)*

| Item | Computer Attributes Scale | SD | D | N | A | SA |
|------|---------------------------|-----|-----|-----|-----|-----|
| 1 | Computers will improve education | | 1.9 | 4.7 | 13.2 | 58.4 | 21.8 |
| 2 | Teaching with computers offers real advantages over traditional methods of instruction | | 3.9 | 6.6 | 22.3 | 48.5 | 18.7 |
| 3 | *Computer technology cannot improve the quality of students' learning | | 14.3 | 52.9 | 17.4 | 12.1 | 3.3 |
| 4 | Using computer technology in the classroom would make the subject matter more interesting | | 1.1 | 3.0 | 10.7 | 59.0 | 26.2 |
| 5 | *Computers are not useful for language learning | | 28.1 | 53.7 | 9.6 | 7.2 | 1.4 |
| 6 | *Computers have no place in schools | | 36.4 | 46.6 | 10.2 | 3.9 | 3.0 |
| 7 | Computer use fits well into my curriculum goals | | 4.1 | 12.4 | 46.6 | 31.4 | 5.5 |
| 8 | *Class time is too limited for computer use | | 3.9 | 22.3 | 14.0 | 41.0 | 18.7 |
| 9 | Computer use suits my students' learning preference and their level of computer knowledge | | 1.7 | 9.9 | 35.0 | 45.7 | 7.7 |
| 10 | Computer use is appropriate for many language learning activities | | 8 | 6.3 | 11.3 | 66.4 | 15.2 |
| 11 | *It would be hard for me to learn to use computers in teaching | | 12.7 | 62.3 | 12.9 | 8.8 | 3.3 |
| 12 | I have no difficulty in understanding the basic basic of computers | | 3.9 | 24.0 | 14.6 | 49.0 | 8.5 |
| 13 | *Computers complicate my task in the classroom | | 14 | 49.6 | 20.4 | 12.1 | 3.9 |
| 14 | Everyone can easily learn to operate a computer | | 2.5 | 9.4 | 20.7 | 53.4 | 14.0 |
| 15 | *I have never seen computers at work | | 46.6 | 39.4 | 7.4 | 5.2 | 1.4 |
| 16 | Computers have proved to be effective learning tools worldwide | | 2.8 | 4.7 | 10.7 | 49.0 | 32.8 |
| 17 | *I have never seen computers being used as an educational tool. | | 30.3 | 47.9 | 8.8 | 10.7 | 2.2 |
| 18 | I have seen some Iranian teachers use computers for educational purposes | | 1.7 | 6.9 | 8.8 | 60.3 | 22.3 |

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree
Note: *negative items were reversed before scoring

Statements 1 to 5 addressed the relative advantages of ICT. Items 6 to 10 comprised the compatibility subscale. As for the complexity subscale, respondents replied to items 11 to 14. In terms of the fourth subscale of computer attributes, observability, items 15 through 18 addressed that domain.

Table 3: Frequency percentages on Cultural Perceptions Scale (N = 120)

| Item   Cultural Perceptions Scale | Percent (%) | | | | |
|---|---|---|---|---|---|
| | SD | D | N | A | SA |
| 1 *Computers will not make any differences in our class-rooms, schools, or lives | 27.3 | 47.9 | 14.9 | 6.9 | 3.0 |
| 2   Students need to know how to use computers for future jobs. | .8 | 4.1 | 11.6 | 53.2 | 30.3 |
| 3 *Students prefer learning from teachers to learning from | 5.2 | 21.8 | 41.6 | 26.7 | 4.7 |
| 4   Knowing about computers earns one the respect of others | 3.9 | 9.6 | 24.2 | 49.0 | 13.2 |
| 5 *We need computers that suit better the Iranian culture and identity | 1.4 | 5.8 | 10.7 | 49.9 | 32.2 |
| 6   Computers will improve our standard of living | 2.8 | 6.9 | 39.4 | 36.4 | 14.6 |
| 7   Using computers would not hinder Iranian generations from learning their traditions. | 3.3 | 14.0 | 19.6 | 52.9 | 10.2 |
| 8   *Computers are proliferating too fast | 2.2 | 5.2 | 5.1 | 42.7 | 44.8 |
| 9   People who are skilled in computers have privileges not available to others. | 1.4 | 3.9 | 15.4 | 56.7 | 22.6 |
| 10 *Computers will increase our dependence on foreign countries. | 12.9 | 30.6 | 27.3 | 19.6 | 9.6 |
| 11 *There are other social issues that need to be addressed before implementing computers in education. | 1.4 | 8.0 | 19.0 | 51.0 | 20.7 |
| 12 The increased proliferation of computers will make our life easier. | 1.7 | 4.7 | 23.1 | 54.0 | 16.5 |
| 13 *Computers dehumanize society. | 11.3 | 47.1 | 21.8 | 14.9 | 5.0 |
| 14 Working with computers does not diminish people' relationships with one another. | 6.9 | 19.0 | 24.8 | 42.7 | 6.6 |
| 15 *Computers encourage unethical practices. | 7.2 | 26.7 | 28.4 | 26.2 | 11.6 |
| 16 Computers should be a priority in education. | 2.2 | 12.1 | 15.2 | 55.6 | 14.9 |

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree
Note: *negative items were reversed before scoring

*Research Question Three: The Relationship between Teacher Attitudes and the Independent Variables*

Table 4: Pearson Product–Moment correlations of attitudes and independent variables
Variable

| | Attitude | Culture | Competence | Access | Training |
|---|---|---|---|---|---|
| Attitude | Attribute | | | | |
| Attitude | 1.00 | | | | |
| Attributes | .771** | 1.00 | | | |
| Cultural | .629** | .716** | 1.00 | | |
| Competence | .504** | .478** | .312** | 1.00 | |
| Access | .398** | .393** | .276** | .505** | 1.00 |
| Training | .171** | .159** | .059 | .381** | .169** | 1.00 |

** Correlation is significant at the 0.01 level (2-tailed)

*Research Question Four: What is the proportion of variance in the Iranian EFL Teachers' attitudes toward ICT explained by the Independent Variables?*

Table 5:  Spearman correlation between attitudes and the demographics

| Variable | Attitude | Gender | Age | Experience | Grade Level | Degree | Training Type | ICDL |
|---|---|---|---|---|---|---|---|---|
| Attitude | 1.00 | | | | | | | |
| Gender | -.025 | 1.00 | | | | | | |
| Age | -.135** | -.282** | 1.00 | | | | | |
| Experience | -.149** | .338** | .828** | 1.00 | | | | |
| Grade level | .064 | .007 | .052 | .066 | 1.00 | | | |
| Degree | .147** | -.028 | -.054 | -.063 | .173** | 1.00 | | |
| Training type | .011 | -.027 | .106* | .134* | -.034 | .035 | 1.00 | |
| ICDL | .165** | .081 | -.089 | -.071 | .132* | .141** | .159** | 1.00 |

*Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

# Discussion and Findings

Findings from the survey data (Table 1) showed that Iranian EFL teachers had overall positive attitudes towards ICT in education, with an overall mean of 3.98 and standard deviation of .626. The high means for the three subscales of this attitude (affective, cognitive, and behavioral) is a further confirmation of these positive results.

The participants' perceptions of the observability of ICT (Table 2) were quite positive. On the other hand, the Iranian EFL teachers' perceptions of complexity and compatibility were the least positive among the four measured attributes of ICT. This finding is consistent with the results of a comparative international study by Pelgrum (2001), in which the difficulty in integrating ICT in instruction was reported to be a major obstacle worldwide. In conclusion, the highest to lowest mean scores on perceptions of ICT attributes in the current study were: observability, relative advantage, complexity, and compatibility.

The majority of EFL teachers in this study reported that they had moderate competence to much competence in using computers.

Home was the place most EFL Iranian teachers (75%) had access to computers. Furthermore, only one percent of the respondents in the current study reported that they had access to computers in places other than school and home, such as Internet cafés or universities.

In addition, in this study it was revealed that having an ICDL certificate increased the positive attitudes of Iranian EFL teachers towards ICT (Table 5).

In addition, it was evident in this study that the younger generation of teachers was more computer-oriented because they were in contact with computers during their school years as students and pre-service training in the universities.

It was found that teaching experience correlated negatively with the Iranian EFL teachers' attitudes towards ICT ($r = -.14$, $p < .01$). This finding indicated that teachers who had less teaching experience had more positive attitudes towards ICT. It was shown that teachers' educational background had a positive relationship with their attitudes towards ICT ($r = .14$, $p < .01$). In this study, gender was found not significantly correlated with Iranian EFL teachers' attitudes towards ICT. Similarly, the grade level that EFL teachers teach was not found to be a significant characteristic that might affect the teachers' attitudes towards ICT (Table 5).

## Recommendations

1) The methodology used in this study may be used to repeat this study to collect data about EFL teachers in other parts of Iran whether urban or rural.

2) This study is a quantitative study in nature, and a multi-part survey is the sole instrument to collect data. It is recommended that qualitative research be conducted, targeting the same population, to provide further information. Future research may examine other factors that may be related to such attitudes, such as self-efficacy, peer influence, administration support, and parents' involvement with schooling.

3) The current study employed a cross-sectional method to gather data on EFL teachers in Iran at a single point of time. It is recommended that future research be of a longitudinal nature in order to provide a more detailed description of the phenomenon and to capture other factors that may play a role in influencing EFL attitudes towards ICT at a deeper level.

# Conclusion

This study identified the factors that might influence the adoption and implementation of ICT by EFL teachers. Because of this pioneering study, the policy makers in Iran will be more informed in their future endeavors regarding the factors that impede or facilitate the implementation of ICT and its adoption rate by Iranian teachers through out the country's educational system.

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