

Full Length Research Paper

An investigation on computer and internet use for agricultural development in rural areas: A case study for Tokat Province in Turkey

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This study aimed at determining the familiarity of the people to computer and internet technologies and for what purposes they use these technologies in rural areas of Tokat Province, Turkey. How people approach these technologies and what socio-economic features affect their use, were also determined. The main data used in the study were collected from a face-to-face questionnaire administered to over 184 people. Based on the results of this study, 36.00% of the individuals in the questionnaire used computer and internet, and the major purpose of the computer's usage was to access the internet. It was determined that these technologies were not used efficiently to develop rural life, agricultural production and professional and personal development. Based on the findings, there was a strong relationship between computer and internet use and social and economic characteristics of the individuals. It was concluded that in order for computer and internet technologies to be used most efficiently in rural areas, fast and planned training studies should be implemented, necessary infrastructure should be developed and examples of successful uses in agricultural production should be shown to people.

Key words: Computer, internet, agricultural production, rural development.

INTRODUCTION

The rural communities, due to inadequate access to advanced telecommunication infrastructure and services, may not be able to fully take part in the emerging information economy. Several studies throughout the world have studied the link between economical development and the presence of different levels of telecommunication infrastructure and a positive relationship has been revealed between access to telecommunication capabilities and improvements in certain economic indicators (Parker et al., 1995, Strover, 2001; Malecki, 2003).

Awareness of technological developments and conti

nuous access to information by people living in rural areas are prerequisites for rural development. Computers and internet, which have started an era in which everything has changed through information technologies, constitute an equalizing effect for rural people traditionally away from developments in information and technology. Rural people can learn developments at the same time as the urban people appreciate information technologies. However, when compared to urban areas, the accessibility and availability of Information and Communication Technology (ICT) is significantly lower in rural areas. Equipment support for online connectivity and ICT awareness can greatly contribute to sustainable rural development in developing countries. ICT can enhance also rural productivity, as well as enable sharing of the solutions between local people and communities, providing access to practical information on small business accounting, weather trends and farming based

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practices. Timely access to market information via communication networks also help farmers to make informed decisions about what crops to plant and where to sell their products and buy inputs. ICT can also provide unprecedented access to rural finance, while the financial and information service network can offer micro-finance opportunities for local people and small enterprises (Abdur Rahman et al., 2005).

However, difficulty with which rural people reach and use these technologies for private communication and entertainment rather than personal and professional development, education and access to the information are significant obstacles to obtain maximum benefit from these technologies. In fact, especially in the developing and less developed countries, research and statistical data show that computer and internet access by people living in rural areas stays lower (Coshand-Hughes, 2000; Strover, 2001; Roberts, 2002; Smallbone et al., 2002; Malecki, 2003; SPO, 2010; TSI, 2010; Herdon, 2010). Detailed reasons for this situation were discussed by some investigators (Cullen, 2002; Rao, 2003).

Some studies mention computer and internet uses in rural areas for private communications and entertainment rather than for professional and personal development, education and access to information (Kraut et al., 1999; Batte, 2005; Demiryurek and Ozer, 2010; Costopoulou et al., 2010). Technological developments provided many benefits and developments, though they were not enough in rural areas. When used properly and efficiently, information technologies hold the key to achieve tremendous developments in a short time.

Computer and internet have been increasingly used in Turkey, and the rate of its users was 22.90 and 18.18% in 2005, and 50.60 and 41.60% in 2010, respectively. In other words, the use of these technologies have doubled in only five years and reached considerable levels. However, these ratios are still very low in rural areas, in that computer and internet access was 25.60 and 23.70% in rural areas in 2010, respectively (SPO, 2010; TSI, 2010).

As mentioned earlier, statistics and some large scale studies may provide a general pattern for computer and internet use. However, studies based on original data about developmental pattern of these significant technologies and their consequences are of special importance. Studies based on field data reveal the current status and possible problems. Besides, they also allow future predictions and development of solutions to the problems.

What is the percentage of peoples' awareness of these technologies? What is their approach towards them? For what reasons do people use them? What are the socio-economical characteristics of people who have access to and use these technologies? This study searched for the answers to these questions and the likes of them. Data from Kazova region of Tokat Province, where agricultural production is a common activity of the people and rural life is pre-dominant for them, were analyzed to determine

the levels of access to and use of computer and internet technologies.

MATERIALS AND METHODS

The data for this study were collected from randomly selected 184 people living in the rural areas of Kazova region of Tokat province, using a face-to-face questionnaire in April 2010. Chi-square (χ^2) test was used to reveal the relationship among the use of computer and internet, and the socio-economic characteristics such as gender, age, income level and educational level.

A pointing system was used in the study to form an integrated evaluation criterion to assess the social mobility and behavior for the following mass media outlets by using a Likert scale. Points were assigned to groups formed via ranking the answers from the best acceptable one to the least. In assigning points for social mobility, visiting frequency to city-county centers and other cities and connections to abroad were taken into account. In assigning points to their behaviors, following the media, reading newspapers and magazines, watching TV, listening to radio and news items followed in these media forms were taken into account. Based on the total points, social mobility was grouped into three classes, that is, low, medium and high mobility; and the behavior of media following was grouped into two classes, that is, low and medium-high level of media following. Analyses were performed based on these groups.

RESULTS AND DISCUSSION

Some basic socio-economic features

The average age of the sampled people was 37. 42% of them were female and 58% were male. However, the average household size was five. The average monthly household income was \$894, and this was higher than the average rural income in Turkey at large in 2007 (\$735.05) (TSI, 2009). About 42% of the sampled people were primary school graduates (Table 1).

The most common occupation of the sampled people was farming. People who had farming as the only occupation constituted 50.00% of the sample. However, some people (8.15%) had other occupations in addition to farming. There were also some homemakers (22.83%), wage-earners (10.33%) and traders (3.26%). The remaining 5.43% of the sampled people were students and unemployed people.

Computer and internet use

Familiarity of the sampled people with the computer technology is given in Table 2.

About half of the people interviewed (45.00%) said they only saw computer somewhere, but were not interested in this technology. 14% said that they did not have experience with computer, but wanted to learn about it. Individuals who did not actively use computer, but had limited amount of information constituted 5.00% of the people interviewed. Accordingly, 64.00% of the

Table 1. Education levels of the sampled people.

Parameter	Frequency	%
Illiterate	9	4.89
Primary school	77	41.85
Secondary school	33	17.93
High school	42	22.83
University	23	12.50
Total	184	100.00

individuals in the study did not use computer and 36.00% did. Computer use was higher than the average for rural areas (25.60%), but lower than the country average (50.60%) (TSI, 2010).

The research findings revealed that great majority of the computer users also used internet (98.51%). Although the purpose of use varied, the main purpose was internet access followed by information storage (Table 3).

The interviewed people had used computer and internet for 4.97 and 4.10 years, respectively. They spent a total of 2.9 h on the computer, and 1.8 h of which was on the internet. 4% of the users had computers in their homes and 3.00% had internet connection. The person who acquired these technologies first installed them at home 12 years ago. There were also individuals who were introduced to them just three months ago. Almost the entire computers at home (93.02%) were desktop PCs. About 79.00% of the people who had computer at home did not know, or had limited level of information about hardware and software features of the computer. The people who replied "I know the features of my computer" were only 21.00%.

Individuals used computer and internet on the average for 5.5 days in a week. About two-third of them (66.00% for computer and 65.00% for internet) used them everyday. Computer and internet use mostly occurred through computers at homes (63.00% for computer and 61.00% for internet). There were other access sources of these technologies such as homes or workplaces of neighbors, friends and relatives, internet cafes in the towns, schools and other places with the percentages ranging from 5.00 to 23.00%. According to the statistics in Turkey, internet is accessed mostly through computers at homes (TSI, 2010).

The findings indicate that people used the internet most for communication (82.00%) (Table 4). It is seen that the communication feature of the internet was a factor that helped its spread in the country as well. Due to its facilitating effect on communication with relatives living in faraway places or abroad, even the primary school graduates took interest in and used the internet. A more conscious use of this potent technology for agricultural

production and marketing, professional and self-development and daily life (such as child care and education) could make it a much more important factor in the improvement of rural life.

Only 2.00% of the sampled population, who used internet as a means of communication, used it to reach agricultural specialists. Considering internet users and all sampled people, the ratio of using this very convenient technology to contact the specialists of any kind remained very low. Internet users generally used it to communicate with the people they know, their relatives and friends (96.30%). There were also individuals who made international connections with their relatives or foreigners (18.52%). Most of the communication was via e-mail (55.56%), followed by voice and visual communication (42.59%), and short messages to chat rooms (46.30%).

In Turkey, statistics show that internet is mainly used for sending and receiving e-mail both in urban and rural areas (TSI, 2010). A study carried out in Pittsburg also showed that the main use of internet was for e-mail communications. The same study found out that internet use has relationships with age and gender (Kraut et al., 1999). It is significant to know whether or not if people, who use internet to reach information, use it to acquire the quality information necessary for their professional and personal developments. Such a use is critical for internet technology to support the development in the rural areas. The research results reveal that about 21.00% of internet users seek information about agricultural issues, while 32.00% seek it for their professions and personal development. News and developments, followed through the internet, are another indication of the correct use of the technology. The results show that the percentage of people who followed the news and developments were 33.00% among the ones who used these feature, 20.00% among the internet users and 7.00% among people who took part in the questionnaire.

Some other studies carried out in other countries also showed that internet use for agricultural production was not efficient enough. It was known that farmers, who are used to the internet, mostly discovered the product prices and weather forecast. It was expressed by different authors that the use of e-trade for agricultural products remained very low (Alvarez and Nuthall, 2006; Michailidis, 2006; Taragola and Van Lierde, 2010). In addition, there were other studies, which mentioned that computer and internet use in rural areas were for private communication and entertainment, rather than professional and personal development, education and access to information (Kraut et al., 1999; Batte, 2005; Demiryurek and Ozer, 2010; Costopoulou et al., 2010). However, some studies mentioned that computer and internet, among significant sources of information of producers, develop agricultural production (Valamoff et al., 2002; Boz et al., 2004; Akca et al., 2007; Yalcinand, 2007; Demiryurek et

Table 2. The use of computer by the sampled people.

Parameter	Frequency	%
Aware of computer, but not using it	82	44.56
Curious about computer, but not using it	25	13.59
Watched people working on the computer, knew some, but never used it	8	4.35
Used computer previously	2	1.09
Using it in a limited fashion	6	3.26
Self-learned, and using it	45	24.46
Received computer training and using it	16	8.69
Total	184	100.00

Table 3. Purpose of using the computer.

Purpose	Frequency	%*
Internet access	66	98.51
Data storage	32	47.76
Writing	21	31.34
Calculation	15	22.38
Record keeping	15	22.38

*Total exceeds 100% due to multiple answers.

Table 4. Purpose of using the internet.

Purpose	Frequency	%*
Communication	54	81.82
Data acquisition	51	77.27
Following news and developments	39	59.09
Playing games	13	19.70
Listening to music and watching movies	12	18.18
E-trade	9	13.64
Extending the knowledge	5	7.58
Others	3	4.55

*Total exceeds 100% due to multiple answers.

al., 2008; Akca et al., 2008; Boz and Ozcatalbas, 2010).

Relationship between computer and internet use and some socio-economic factors

The research results reveal that the use of information technologies, such as computer and internet, became common and a significant part of life in rural areas.

Recognizing the adoption and use of almost every new technology, it is inevitable that personal, cultural, demographical and psychological factors are significant in information technologies. In the study, chi-square test, which is one of the non-parametric tests, was used to determine the presence of relationships between computer and internet uses and some demographic and

economic factors such as age, gender, marital status, education level and income level.

Since the data about the use of these two technologies are almost completely overlapped, only the data about computer use were taken into account. However, comments were made on both computer and internet use. Findings indicate that the age of the sampled people was a very important factor in use of both technologies. The 18 to 28 age group was notably different from others and they used computer and internet much more frequently than others. As people got older, they used these technologies less.

Gender of the sampled people was not a significant factor in computer and internet use. It was seen that males and females used these technologies similarly. Education level of the sampled people was a factor that

Table 5. Relationship between computer and internet use and the socio-economic characteristics of the sampled people.

Parameter	Using it		Not using it		Total	
	Frequency	%	Frequency	%	Frequency	%
Age (years)						
18-28	40	59.70	14	11.96	54	29.35
29-38	17	25.37	30	25.64	47	25.54
39-48	6	8.96	33	28.21	39	21.20
49- +	4	5.97	40	34.19	44	23.91
Total	67	100.00	117	100.00	184	100.00
$X^2: 54.714, X^2_{0.001,3} :16.27$						
Gender						
Male	44	65.67	62	65.67	106	57.61
Female	23	34.33	55	34.33	78	42.39
Total	67	100.00	117	100.00	184	100.00
$X^2: 2.805, X^2_{0.10; 1} : 2.71$						
Education level						
Illiterate	0	0.00	9	7.69	9	4.89
Primary school	6	8.96	71	60.68	9	41.85
Secondary school	10	14.93	23	19.66	77	17.93
High school	29	43.28	13	11.11	33	22.83
University	22	32.83	1	0.86	42	12.50
Total	67	100.00	117	100.00	23	100.00
$X^2: 87.106, X^2_{0.001,4} :18.47$						
Marital status						
Single	38	56.72	7	5.98	45	24.46
Married	29	43.28	110	94.02	139	75.54
Total	67	100.00	117	100.00	184	100.00
$X^2: 59.353, X^2_{0.001,1} :10.83$						
Monthly income (US\$)						
20 – 232	38	56.72	97	82.91	135	73.37
233 – 463	20	29.85	16	13.67	36	19.56
464 ≤	9	13.43	4	3.42	13	7.07
Total	67	100.00	117	100.00	184	100.00
$X^2: 15.727, X^2_{0.001,2} : 13.82$						
Household size (people)						
Five or less	50	74.63	81	69.23	131	71.20
Six or more	17	25.37	36	30.77	53	28.80
Total	67	100.00	117	100.00	184	100.00
$X^2: 0605, X^2_{0.005,1} :3.841$						
Occupation						
Farming only	20	29.85	72	61.54	92	50.00
House maker	14	20.90	33	28.20	47	25.54
Others	33	49.25	12	10.26	45	24.46
Total	67	100.00	117	100.00	184	100.00
$X^2: 35.939, X^2_{0.001,2} : 13.82$						

Table 5. Contd.

Presence of household members working in occupations other than agriculture						
Yes	39	58.21	28	23.93	67	36.41
No	28	41.79	89	76.07	117	63.59
Total	67	100.00	117	100.00	184	100.00
$X^2: 21.619, X^2_{0.001;1}: 10.83$						
International connection						
Yes	15	22.39	11	9.40	26	14.13
No	52	77.61	106	90.59	158	85.87
Total	67	100.00	117	100.00	184	100.00
$X^2: 5.921, X^2_{0.005;1}: 3.841$						
Social mobility						
Low	20	29.85	87	74.36	107	58.15
Moderate	27	40.30	24	20.51	51	27.72
High	20	29.85	6	5.13	26	14.13
Total	67	100.00	117	100.00	184	100.00
$X^2: 38.958, X^2_{0.001;2}: 13.82$						
Behavior of following media forms						
Low	26	38.81	84	71.79	110	59.78
Moderate or high	41	61.19	33	28.21	74	40.22
Total	67	100.00	117	100.00	184	100.00
$X^2: 19.284, X^2_{0.001;1}: 10.83$						

significantly affected computer and internet use. As the level of education increased, so did the frequency of computer and internet use. University graduates were clearly different from the rest of the people in the questionnaire, in that almost all of the university graduates used these technologies. Marital status of the sampled people significantly affected the use of these technologies. Unmarried individuals used them more than married people.

Income level of the sampled people, a factor which generally affects the adoption of new technologies, was also significant in the use of computer and internet technologies. Based on the average monthly income, the low income group was especially clearly different from others, and they used these technologies much less than expected. As the income increased, so did the use of these technologies.

Some of the research in the literature about the topic dealt with what kind of factors the use of information technologies were related to. These studies concentrated on age, gender, education and income levels. Results often show that these factors had effects on both computer and internet use, and frequency and purpose of using them. Findings in this study about education and income levels and age had close parallels to some of

other studies (Kraut et al., 1999; Schumacher and Morahan-Martin, 2001; Pan and Marsh, 2010). The research results indicate that there was no relationship between household size and usage frequency of these technologies.

There was a strong relationship between the nature of the sampled people's occupation and computer and internet use (Table 5). The people living in rural areas, workers in jobs other than agriculture (workers in public or private sector and businessmen), and students or people looking for jobs used computer and internet more frequently than others. The presence of people in households working in sectors other than agriculture positively affected the use of information technologies. There was a strong relationship between computer and internet use and the presence of at least one individual in the households employed in areas other than agriculture.

Presence of relatives and friends living abroad and regular communication increased e-mail, and consequently, internet use. Such a relationship could be due to two different reasons: higher probability of people with relatives living abroad to meet and obtain these technologies, and easy and cheap communication with people living faraway made possible by the internet. Even illiterate people can make internet communications if

helped by others.

Social mobility of the individuals and their behavior of following the media were determined using a point assigning method. The pointing technique and the involved sub-criteria were explained in the "Materials and Methods" of the study. Statistical analyses showed that social mobility and tendency to follow the media had a significant positive impact on computer and internet use. In another study, it was concluded that internet use positively affected data acquisition from modern information sources (Boz and Ozcatalbas, 2010).

Conclusion

With the advent of computer and then the internet in serving human beings, a new period started for the entire world, in which new and great developments could be achieved. In an era when these two technologies have transformed many things for humanity, it is inevitable that they will also change the agricultural production and rural life. Studying the effect of information technologies on the change of agriculture and rural life would contribute to the development of better policies. In this study conducted in Kazova Region of Tokat Province in Turkey, determining the current status of computer and internet uses and factors affecting them were aimed.

Based on the results, about 36.00% of the people in the area used computer and internet. The main purpose of using computer was to access the internet and data about frequency of use of the two technologies (frequency and duration of use, place of use and the time period since the beginning of its usage), were very similar to each other. It could be said that the technologies studied were not used very efficiently for the improvement of rural life and agricultural production and for vocational or personal development.

It was found that computer and internet use was closely related to criteria, such as age, gender, education and income levels, marital status, occupation, presence of individuals in household working in sectors other than agriculture, international connections, social mobility and tendency to follow the media. Relatively, younger people, males, singles, people with higher levels of education and income used computer and internet technologies more frequently. In addition, the people living in rural areas tend to use internet more if working in a sector other than agriculture. Computer and internet use was higher when at least four individuals in a household worked in sectors other than agriculture. Besides, the use of information technologies were also higher with people who had high social mobility and were more involved in following the media.

Technological developments are adopted later in rural areas when compared to urban ones all over the world. It can be expected that the same is true for computer and internet technologies. In fact, these technologies can

result in very important transformations in agricultural production and rural life. In order for these transformations to take place, proper and efficient use of these technologies are crucial. Correct, efficient and proper use of computer and internet in accordance with their aims of development is necessary especially in rural areas. For this aim, fast and efficient training programs are needed. Besides, rural infrastructure of information technologies should be improved for an efficient access to information via these crucial technologies. People should be more aware of what can be done as a result of the power of these technologies through showing the success stories.

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