

## The Relationship Between Internet Anxiety, Internet Self-Efficacy, Internet Identification and Internet Use: Case of Agricultural Students

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**Abstract:** The main purpose of this study was to investigate relationship between Internet anxiety, Internet self-efficacy, Internet identification and Internet use by agricultural students. The statistical population was postgraduate agricultural students (M.Sc.) at Zanzan University who were selected using a simple random sampling technique. Sample size for students was 118 persons. The study was conducted during autumn 2010 using a descriptive, correlational design. Data was gathered via the use of questionnaire. The instrument validity and reliability was confirmed based on opinions of a panel of experts and Cronbach's alpha coefficient respectively. Results revealed that the postgraduates had medium level Internet anxiety and high level Internet self-efficacy and Internet identification. The t-test showed that female students had significantly higher Internet anxiety than did male students. Further, results indicated that there was a positive significant relationship between public and professional Internet use by students and their Internet identification and Internet self-efficacy. In addition, the relationship between Internet anxiety and professional Internet use was negative.

**Key words:** Agricultural education • Anxiety • Identity • Internet • Self-efficacy

### INTRODUCTION

In this modern and advancing age, the Internet is a powerful complement to traditional teaching methods in higher education. It enables individuals to communicate directly with others ignoring class, gender, origin and nationality differences and that makes the world a cyber society [1]. Nowadays, the Internet has fundamentally altered the practice of teaching and learning. It is one of the more cost-effective ways of improving an educational system [2] and provides exciting opportunities to both students and teachers. Effective use of the Internet can increase academic productivity and enhance educational quality in agricultural higher education. The Internet can achieve the following characteristics for agricultural higher education institutions:

- 1) Make it possible to provide an increasing variety of distance educational opportunities for those who may not be able to attend a university in person;
- 2) Increase student interaction with other students in different universities;
- 3) Provide access to additional educational opportunities;
- 4) Provide opportunities for in-service

- training;
- 5) Create closer contact between students and their professors and fellow classmates;
- 6) Increase flexibility for traditional students;
- 7) Improve the quality of teaching by achieving higher levels of learning, such as analysis, synthesis, problem solving and decision making;
- 8) Provide students and faculty members' access to information, references and resources;
- 9) Create an individualized and enhanced learning experience for students;
- 10) Provide databases, networks and a dizzying array of software to maintain academic and financial records; and
- 11) Enable professors to collaborate on research.

These are only some of the advantages of the Internet for agricultural higher education and list is open for further addition. For this reason, the colleges of agriculture urgently need the application of the Internet in order to enhance the quality of teaching and learning. In much the same way, many universities have also adopted new technologies in an attempt to improve their performance and to adapt to new environments [3]. The use of the Internet by agricultural students at Zanzan University is an inevitable part of their education.

The agricultural college at Zanjan University includes a computer centre that grants free round-the-clock access to the Internet to all students. In addition, master's students have an extra dedicated computer centre with 40 PCs. In some departments, it is also possible to connect to the Internet even in workshops and laboratories. The college has also made it possible for the students to use their notebook wireless capacity to connect to the Internet on the campus. For a successful implementation of Internet-based learning environments, planners of higher education, first, should study more about students' preferences toward these environments. Investigating Internet acceptance by students is a critical factor for the successful integration of Internet technologies into teaching and learning process in agricultural higher education. It is necessary to identify the level of students-Internet interaction to understand why students choose to use or not the Internet. There are a range of social and psychological factors which influence students' use of the Internet. We need to identify these factors and find ways of facilitating students' use of the Internet. In this study, we investigated three factors that may affect Internet use by postgraduate students of agriculture in University of Zanjan (because the university lacks the Ph.D. program and because bachelor students use the Internet less often than masters students). The psychological factors studied in this research were as following:

**Internet Anxiety:** In general, the use of technology often has unpleasant side effects, which may include strong, negative emotional states that arise during interaction with computers. Frustration, confusion, anger, anxiety and similar emotional states can affect not only the interaction itself, but also productivity, learning, social relationships and overall well-being [4]. There are many definitions and interpretations of anxiety. Seligman, Walker and Rosenhan [5] described anxiety as having cognitive, somatic, emotional and behavioral components that entail expectations of a diffuse and uncertain danger while Sanders [6] said that anxiety is a complex network of different elements-cognition, emotion, biology, behavior and environment- which are linked and trigger one another off. With the advent of computers and Internet, the term was soon extended to computer and Internet literature and many researchers tried to investigate the relationship between computer anxiety and Internet anxiety with computer use and Internet use. There are numerous definitions of computer anxiety in the related literature. For instance, Hakkinen [7] defined computer

anxiety as fears and suspicions of people unfamiliar with computers while Maurer [8] believed that computer anxiety is the fear and apprehension felt by an individual when considering the utilization of computer technology or when actually using computers. Computer anxiety is an important problem in many societies since many people carry negative feelings toward computers and avoid using computers despite the big infusion of computers in every part of life [9]. A number of studies found that there is significant relationship between computer anxiety with attitude toward computers and computer use [10-19].

Internet anxiety is, of course, closely related to computer anxiety, but the concepts are distinct [20]. Internet anxiety is the fear or apprehension that individuals experience when using the Internet [21]. The Internet may cause anxiety because it requires students to learn new terminology and understand new applications that may seem unfamiliar for them [22, 23]. Presno [21] identified four areas of Internet anxiety from her qualitative study:

- Internet terminology anxiety: anxiety produced by an introduction to a host of new vocabulary words and acronyms.
- Net search anxiety: anxiety produced by searching for information in a mazelike cyberspace.
- Internet time delay anxiety: anxiety produced by busy signals, time delays and more and more people clogging the Internet.
- General fear of Internet failure: a generalized anxiety produced by fear that one will be unable to negotiate the Internet, or complete required work on the Internet.

Internet anxiety is a concept-specific anxiety, because it is a feeling that is associated with a person's interaction with Internet. In sum, Internet anxiety is the fear or stresses that one experience while using Internet. Researchers have found that Internet anxiety has a negative relationship with total hours of Internet use [24, 25].

**Internet Self-Efficacy:** The construct of self-efficacy has emerged as a central facet of social cognitive theory and is an important psychological construct in understanding the reason why people choose to follow particular activities and the extent of effort they allot to these. Bandura [26] was the first writer to use the term self-efficacy. He defined self-efficacy as people's judgments of their capabilities to organize and execute courses of

action required to attain designated types of performances [27]. More importantly, self-efficacy is not about the amount or quality of one's skills, but, rather, what one believes he/she can achieve with those skills. Schunk, *et al.* [28] explained self-efficacy as one's perceived capabilities for learning or performing actions at designated levels. Self-efficacy affects the three indexes of motivation: active choice, mental effort and persistence. Active choice is determined by an individual's willingness to engage in difficult tasks or avoid a task. Highly efficacious learners actively choose difficult tasks. Mental effort is determined by the rate of performance and how much energy is required for said performance, especially with challenging tasks [28, 29]. Persistence is evidenced by a learner working for extended periods of time toward the completion of a task, especially when faced with challenges. As well, self-efficacy is assumed to have three components: magnitude- the levels of task difficulty that people believe they can attain; strength- the conviction regarding magnitude; and generality- the degree to which the expectation is generalized across situations. In assessing these components, the purpose is to discover the type of questions that will best explain and predict someone's dispositions, intentions and actions [30]. In summary, self-efficacy is a critical aspect of motivation and can predict behavior between people as well as the degree to which and individual's self-efficacy changes over time [31]. The term self-efficacy was soon extended to particular domains, including the use of computers and Internet. Compeau and Higgins [32] defined computer self-efficacy as a judgment of one's capability to use a computer. Adapted from the self-efficacy concept, computer self-efficacy is the extent of an individual's perceived ability to use a computer.

Another term in the area of self-efficacy is the Internet self-efficacy. Tsai and Tsai [33] defined Internet self-efficacy as individuals' perceptions about their own abilities toward using the Internet. Internet self-efficacy is the belief a person has about her ability- not the quality of the abilities-to use an Internet to complete a task. Research has suggested that frequency of Internet usage positively relate to Internet and computer self-efficacy [15, 33- 38].

**Internet Identification:** Identity is a psychological factor which is thought to be important in Internet use and experience. Researchers have conceptualized identity in several ways. Facer *et al.* [39] conceptualized it in terms of consumption while Holloway and Valentine [40] focused on social identity. In this research we focus on domain

identification, which derived from some researches [41-43] and is highly suited to the study of Internet use. An important concept in this area is the notion of a domain, which is defined as a performance context (e.g. Internet) where an individual can put skill or a set of skills into practice [44]. Internet identification is a type of domain identification and is inherently bound with images of those who use the Internet [45]. In other words, Internet identification refers to the extent to which students' self-concept is bound up with their perceived ability to use the Internet. Domain identification has implications for decisions and behaviors. The higher one's identification with a particular domain, the more likely one is to participate within this domain. Many researchers have emphasized that domain identification is positively related to current behavior in that domain [24, 44- 49].

The goal of this research was to investigate psychological factors such as Internet anxiety, Internet self-efficacy and Internet identification affecting Internet use by agricultural students. Specific objectives of the study were to:

- Describe agricultural students' Internet use, Internet anxiety, Internet self-efficacy and Internet identification;
- Evaluate student differences in Internet use, Internet anxiety, Internet self-efficacy and Internet identification with a look at gender and;
- Examine the relationships between Internet anxiety, Internet self-efficacy and Internet identification and Internet use by agricultural students.

## MATERIALS AND METHOD

A descriptive, correlational design was utilized in the study. The statistical population (N=413) was postgraduate agricultural students (M.Sc.) in Zanjan University during autumn 2010. They all belonged in the middle socio-economic class. A simple random sampling was employed to select a sample of 118 students. The instrument of the survey was a questionnaire which was distributed to the sample during their class sessions. The questionnaire included five major components: (1) demographic information, (2) Internet identification scale, (3) Internet anxiety scale, (4) Internet self-efficacy scale and (5) Internet usage. Demographics included gender, age, major, computer ownership and students' prior Internet experience. The scales for measuring Internet anxiety and Internet identification were adapted from Ealy

[50] and Joiner *et al.* [24] researches respectively. Internet anxiety scale consisted of 20 items and Internet identification scale included 10 items. Each item was scored on a five-point Likert scale (from 1= strongly disagree to 5= strongly agree). A scale was developed to measure Internet self-efficacy using a modified version scale from previous study and students were asked six questions using a five point Likert scale. The researchers used two measures to assess the students' Internet use. The first was a scale to measure public Internet use (The use of Internet for general purpose such as chat, e-mail, listening to music, etc.) and the second was a scale to assess professional Internet use (The use of Internet for educational purpose) by students. They answered using a five-point Likert type (0= never, 1=seldom, 2= sometimes, 3= often, 4= always). The content validity of the questionnaire was assessed by the experts of the agricultural education and information technology regarding the relevance of the items and the unambiguity of their formulation. The pilot test was conducted in university of Tehran and Cronbach's alpha was estimated for the scales used in the study to ensure internal consistency among the items. The reliability of the scales was 0.86, 0.74, 0.70, 0.70 and 0.77 for Internet anxiety, Internet identification, Internet self-efficacy, public Internet use and professional Internet use respectively, which is considered to be an acceptable index for field research [51].

Data were analyzed using frequencies, percentages, means and standard deviation. The independent samples T-test was used to test for differences if any among students' Internet use, Internet anxiety, Internet identification and Internet self-efficacy based on their gender. The Pearson product-moment correlation was employed to find a relationship between the variables of the research including Internet anxiety and Internet use, Internet self-efficacy and Internet use and Internet identification and Internet use.

## RESULTS AND DISCUSION

From the total respondents, 64.4% were females and 35.6% were males. Approximately 11.2% of the students were less than 22 years, 49.1% were between 22 and 24 years and 39.7% were above 24 years old. As for possessing personal computer at home, the percentage was 89.8, but 10.2 percentage of the students did not possess any personal computer. The minimum use made of the Internet was 4.2% while 13.6% were fair users of the Internet, 33.1% were Internet semi-users and 49.1% highly used the Internet (Table 1). Regarding their majors, 24.8% subjects were majoring in animal sciences, 18.6% were studying in crop production and breeding, 15.9% were students of soil sciences and the rest studied agricultural extension and education, horticulture, agricultural entomology, or Irrigation. Of the participants, 27.1% reported that they pass at least one course on how to use the Internet while 72.9% did not.

### **Agricultural Students' Internet Use, Internet Anxiety, Internet Identification and Internet Self-Efficacy:**

Table 2 summarizes descriptive statistics for variables used in the analysis, including the number of respondents for each measure. Note that each scale is based on a five-Likert scale. The finding revealed that the students moderately (M=2.28) used the Internet for general purpose and they highly used it (M=3.13) for educational purpose. Results also indicated that the students had medium level of Internet anxiety (M=2.56) and high level of Internet self-efficacy (M=3.37) and Internet identification (M=3.26).

### **Student Differences in Internet Use, Internet Anxiety, Internet Identification and Internet Self-Efficacy:**

A set of independent-samples t-tests were conducted to compare the public Internet use, professional Internet use, Internet anxiety, Internet identification and Internet self-efficacy

Table 1: Frequency and percentage of gender, computer ownership and Internet experience

Demographic profile		n	%
Gender	Male	42	35.6
	Female	76	64.4
Computer ownership	Yes	106	89.8
	No	12	10.2
Internet experience	Less than 1 year	5	4.2
	1-3 years	16	13.6
	3-5 years	39	33.1
	More than 5 years	58	49.1

Table 2: Descriptive Statistics for Public Internet Use, Professional Internet Use, Internet Anxiety, Internet Self-efficacy and Internet Identification

Variable	n	Mean	SD
Public Internet Use	118	2.28	0.97
Professional Internet Use	118	3.13	1.03
Internet Anxiety	118	2.56	0.80
Internet Self-efficacy	118	3.37	0.94
Internet Identification	118	3.26	0.89

Table 3: Independent Samples t-Test for Internet Use, Anxiety, Identification and Self-efficacy Across Gender

Variable	t	df	p-value	eta <sup>2</sup>
Public Internet Use	1.35	116	0.1855	0.015
Professional Internet Use	-0.733	116	0.4665	0.005
Internet Anxiety	-2.167	116	0.0325*	0.036
Internet Self-Efficacy	-0.137	116	0.8915	0.000
Internet Identification	-0.568	116	0.5715	0.003

\*: statistically significant at 5% significance level

Table 4: Pearson product-moment correlation for Internet Anxiety, Internet Self-efficacy, Internet Identification, professional Internet use and public Internet use

Random variable-1	Random variable-2	Correlation coefficient
Internet Anxiety	Professional Internet Use	-0.230*
Internet Self-efficacy	Professional Internet Use	0.414**
Internet Identification	Professional Internet Use	0.230*
Internet Anxiety	Public Internet Use	-0.092
Internet Self-efficacy	Public Internet Use	0.215*
Internet Identification	Public Internet Use	0.323**

\*: statistically significant at 5% significance level

\*\*: statistically significant at 1% significance level

scores for males and females (Table 3). As for public and professional Internet use scores, there was no significant difference between the scores of males and females. In relation to Internet anxiety scores, there was a significant difference between the scores of males (M=48.24, SD=8.81) and females [M=51.92, SD=8.86; t(116)=-2.167, p=0.0325], in which females had higher scores than males. The magnitude of the differences in the means was small (eta<sup>2</sup>=0.036) (see reference number 51). As for Internet self-efficacy and Internet identification scores, the difference between the scores of males and females was not significant.

**Relationships Between Psychological Factors and Students' Internet Use:** A Pearson product-moment correlation matrix was created to determine if there is any relationship between students' Internet anxiety, Internet self-efficacy and Internet identification and their Internet use. Table 4 displays Pearson correlation analysis between students' scores on Internet anxiety, Internet self-efficacy and Internet identification and their internet use. It was found that students' professional internet use and their scores on Internet self-efficacy (r=.414, n=118, sig=.000) and Internet identification (r=.230, n=118, sig=.012) were positively significantly correlated. On the

other hand, students' professional internet use was negatively significantly related to their Internet anxiety (r=-0.230, n=118, sig=.012).

The same statistics was used to determine the relationship between students' Internet anxiety, Internet self-efficacy and Internet identification and their public Internet use. It is revealed from table 4 that Internet self-efficacy had positively significant relationship with public internet use by students (r=.215, n=118, sig=.019). The strength of the relationship between Internet self-efficacy and public internet use was small [51]. In this manner, students' public internet use and their scores on Internet identification were positively significantly correlated (r=.323, n=118, sig=.000). The strength of the relationship between Internet identification and public internet use was medium.

**Conclusions and Recommendations:** Psychology has an important role in advancing understanding of why students choose to use or not the Internet [57]. The overall aim of this study was to investigate the relationship between some psychological factors such as Internet anxiety, Internet self-efficacy and Internet identification with Internet use by the students from the Faculty of Agriculture in Zanjan University in Iran.

This study found that there was a moderate positive and statistically significant correlation between Internet self-efficacy and students' professional Internet use. That is, students with higher Internet self-efficacy will use the Internet for university course work more than students who had lower level Internet self-efficacy. The researchers also found a small positive and statistically significant relationship between Internet self-efficacy and public Internet use by the students. It means that students with high level Internet self-efficacy were more confident about using the Internet for general purpose than those who had low level Internet self-efficacy. The finding was in line with results of other researches [15, 33, 35, 38]. There are many approaches for increasing the Internet self-efficacy of students. For example, Internet self-efficacy can increase if students feel that they can perform the same tasks they witnessed others experience. Similarly, encouraging students to engage in Internet activities can enhance Internet self-efficacy. The present research also found that students' professional Internet use was negatively correlated with their Internet anxiety. It means that students who had high Internet anxiety scores will use the Internet for educational purpose less than those who had lower Internet anxiety. In other words, those who use the Internet more may have lower anxiety toward Internet and vice versa. This finding was consistent with pervious research [24, 56]. Furthermore, male students reported lower level of Internet anxiety than females. Similar findings were reported by other researchers [13, 15, 24, 52-55]. A high level of Internet anxiety may lead to resistance to the use of the Internet. Training in Internet use for fulfilling educational tasks and encouraging peer help are useful ways to increase students' familiarity with the Internet and may thus decrease their Internet anxiety.

It was found that there was a moderate positive and significant relationship between Internet identification and students' public Internet use. In much the same way, there was a small positive and statistically significant correlation between Internet identification and professional Internet use by students. The finding was in line with results of other researches [24, 46, 47]. Hence, students who identify with a particular domain such as Internet are more likely to use the Internet. Conversely, students who do not identify with the Internet are less likely to apply the Internet. In other words, the students who are characterized as professional user of Internet use the Internet more often than others. The results of this research could help Iranian universities and educational

institutions to better understand their students' attitudes toward the Internet and will enable them for promoting Internet use in their educational activities.

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