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**GENDER AND AGE AS CORRELATES OF COMPUTER SELF –EFFICACY: A
STUDY WITH SPECIAL REFERENCE TO INDORE REGION**

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ABSTRACT

This study is aimed to investigate gender differences regarding computer attributes and perceived self-efficacy in the usage of computer. Nowadays, both male and female have equal opportunity to acquire Computer knowledge and learn computer related skills. However, until recently, some people still perceive that female have less ability, compared to male, to perform computer related job. The research focused on finding out how people stereotype difference computer tasks and whether the stereotype of computer tasks moderate the gender difference in the use of computer software and computer self-efficacy.

100 respondents were surveyed and the result revealed that there is a significance difference in age and gender which varies according to their groups.

KEYWORDS: Self-Efficacy, Gender.

INTRODUCTION

In recent years, computer has made a vivid impact on each generation. Computer usage has influenced almost every business and it acts as strategic weapon to revolutionize the way the business operate. It is used by every generation based on their area of interest. Although, some people are passionate about using computers, others may be nervous. Initially people were not aware about computer usage and its advantages but as they are becoming more computer savvy they are being passionate about it.

In contemporary scenario, most of the work in educational institutes is done through computers. Data related to different departments are collected, analyzed and disseminated through computers. The faculty members in educational institutes belong to various generations and researches have revealed that latest diversity issue faced by the organizations is the age diversity. In educational institutes, two generations i.e. GEN X (born between 1965 and 1976) and Millennials or GEN Y (born between 1977 and 1997) of faculty members are existing predominately. The workplace of tomorrow will be determined by the confidence and skills the faculty members possess while performing the task. Faculty members should possess optimal self efficacy level while working with computers. The study also considers the gender diversity. Thus, a framework needs to be presented for conceptual clarity to build the base of investigation.

RELATED WORK

Perceived computer self-efficacy is a significant parameter in using computers (Işman & Çelikli, 2009; Işıksal, 2003; Aşkar, 2001) and various scales were used to measure perceived computer self-efficacy (Akkoyunlu, Orhan & Umay, 2005; Torkzadeh & Koufteros 1994; Harrison & Kelly,1992). Computer Self-Efficacy is a better measure of actual performance than actual competence, because a person's Computer Self-Efficacy is aligned with previous experiences and may determine how a person approaches a task in a given domain (Smith, 2001). However, discrepancies in a person's CSE may occur because of misjudgments of knowledge or task requirements (Bandura, 1977). Imhof, Vollmeyer and Beierlein (2007) reported that no evidence of a gender gap in computer self-efficacy. Although, they noticed a gender difference in the use of technology for personal use.

According to Lauman (2001), students who use a computer at home demonstrated an increased level of comfort and tenacity when using computers at school. Given males' higher levels of home computer use, one might assume that

this factor accounts for gender differences in computer confidence. Studies of CSE have been conducted on individuals in the work force (Decker, n.d; Harrison and Rainer,1997; Compeau and Higgins,

1995; Burkhardt and Brass, 1990; Gist.et al, 1989). These studies demonstrated the impact that CSE has on increasing performance and the technological innovation of employees, reducing computer induced anxiety, and promoting higher occupational positions. Other CSE studies have used student subjects at a university level (Karsten and Roth, 1998a; 1998b; Langford and Reeves, 1998). Overall, these studies showed that higher levels of CSE corresponded to increased performance in computer courses and a greater achievement of computer competency.

In a report by Software and Information Industry Association (2000), which sums up research into educational technology over the last 20 years, it is mentioned that teachers are more effective after receiving extensive training for integrating technology into the school curriculum. In the same publication; it is also reported that teachers who have successfully used communication technologies such as e-mail, news groups and mailing lists in order to exchange ideas on educational matters, demonstrate greater progress in self-efficacy and confidence in their teaching abilities compared to teachers lacking access to such tools.

A study conducted by Wallace (1999 quoted in Khorrami- Arani, 2001) on education and computer students (subject-specific), investigated the correlation between the computer self-efficacy of a 3-item measure (basic, advanced skills and file-software) with main factors such as computer anxiety, computer confidence and computer knowledge, in order to describe the influence and the development of computer self-efficacy. Comparisons reported that computer students expressed low levels of computer anxiety, and higher levels of computer knowledge and computer confidence in comparison with education students (Khorrami-Arani, 2001). Shaw and Shaw, F. S., & Giacquinta, J. B. (2000) suggested that two frequently held beliefs, that older adult students showed more resistance than do younger students toward computing for academic purposes and that males are more involved with, interested and skilled in the use of computers than females, are no longer accurate. Pervasive use and importance of computers among undergraduates (Green, 1998; Sax et al.,1998) and striving for professional advancement (Fulkerth, 1998; Sax et al., 1998) have been suggested as possible reasons to account for these findings.

Researches strongly revealed that self-efficacy can influence behavior (Maitland, 1996; Delcourt & Kinzie, 1993; and Bandura, 1992). Miura (1987) suggested that a person's self-efficacy towards a task will influence the decision to take on a task, the amount of effort used on the task and the persistence in accomplishing the task. Applied to computer self-efficacy, this would suggest that one's choice, effort and persistence in using computer technology is influenced by one's level of computer self-efficacy. Previous studies have reported some differences in the attitudes of males using computers compared with females, while some other studies report no such difference. The aim of this study is to detect that how age and gender impact on Computer Self-Efficacy

CONCEPTUAL FRAMEWORK

The term Computer Self Efficacy (CSE) is derived from the concept of Self Efficacy. Bandura (1977) coined the term "Self-Efficacy. He further in 1986 explained self-efficacy as the people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. Self Efficacy refers to an individual's perception of his or her skill to perform certain task on his or her own. It represents the belief and expectations in ones capability to successfully perform the given task. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses.

Self-efficacy by itself is not a measure of one's skills, but represents what the persons believe they can do based on their abilities. Individuals with higher self-efficacy would exert greater degree of effort, persistence and resilience Pajares, F. (1997)in comparison to individuals who exhibits lower level of Self-efficacy. Self- efficacy affects individual's choice of processing learning activities i.e., how much effort they will devote and how long they will sustain effort in dealing with difficult situations (Bong and Clark, 1999; Klassen 2002) It is also possible that an individual may exhibit high levels of Self-efficacy in one domain while lower level of Self-efficacy in another domain. In context of Computer Usage, when individuals are presented with new technologies, the level of self efficacy they possess affects their confidence about how they will use it.

As self-efficacy scores the outcomes of the skills one possess therefore when it refers to the technical skills the outcome can be expected in the form of ready acceptance of the relevant technology. Similarly the relationship between self-efficacy and personal computer use is perhaps intuitively obvious. Personal computers represent a

complex and somewhat troublesome technology, requiring considerable skills and extensive training to operate successfully. Self-efficacy is essential to overcome the fear many novice users' experiences. In a landmark study, Compeau and Higgins (1995a, b) applied Social Cognitive Theory (SCT) and the concepts of Computer Self-efficacy to the study of end-user computer training and usage. They defined computer self-efficacy as "a judgment of one's capability to use a computer". While discussing computer self-efficacy, Compeau and Higgins (1995a) distinguished it with component skills such as formatting disks, booting up the computer, using software to analyze data, etc.

Adapted from the concept of Self-efficacy, Computer Self-Efficacy refers to the belief in one's capability to use a computer and attain the given outcome. Compeau & Higgins, (1995) defined computer self-efficacy as "an individual's ability to apply his or her computer skills to a wider range of computer related tasks". Ma and Liu (2005) explained that CSE assess an individual's judgment of his or her ability to apply computer skills in a more encompassing mode, such as finding information or troubleshooting search problems. It is a belief in one's capabilities to successfully perform a computer-related task and is related to computer-related stress when people use these technologies.

This paper explores the relationships between the Computer Self-Efficacy and cognitive factors age and gender. Authors summarize the proposed relationship to be tested in this study in Figure 1.

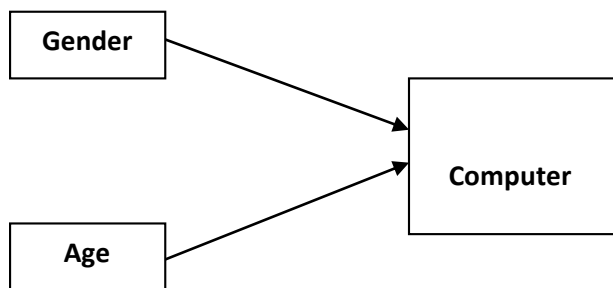


Figure 1: Relationship between Computer Self-Efficacy, Gender & Age

Gender

When examining gender, it is important to define and understand the term. Gender is defined by the American Heritage Dictionary as "Classification of Sex." In context of Computer Self Efficacy, gender gap exists between males and females in the use of computer technology. The role of gender differences in using computer technology for learning has been extensively researched.

Age

In context of Computer Self Efficacy, authors observed the behavior of age in two categories, i.e. above 40 years and below or equal to 40 years. In this contemporary milieu, the usage of technology depends on their ability to acquire new computer technologies. It also depends upon their passion to learn computer skills.

RATIONALE OF THE STUDY

In today's competitive and contemporary era, computer technology has become vital addition in our personal and professional life. No domain has been left untouched by computers. The burgeoning importance of computers has created a need to study the belief of individuals with respect to usage of computers. In educational institutes' faculty and staff members are using computers for data management and liaisoning with other departments. But due to digital divide i.e., inequalities in technological knowledge, accessibility and skill, they develop different belief or perception about their efficacy levels. It is therefore crucial to understand how variables like job satisfaction, performance, anxiety levels etc affect CSE. But no such study has been conducted that correlates gender and age with CSE in educational institutes. To fill this void, present study has been undertaken with an aim to study such variables and generate the mass of knowledge that could be meaningfully used by academicians and practitioners to foster excellence in today's Robert driven era.

OBJECTIVES OF THE STUDY

1. To study the impact of gender on computer self efficacy.
2. To study the impact of age on computer self efficacy.
3. To find the interactive effect of gender and age on computer self efficacy.
4. To open up new vistas of research and develop a base for application of the findings in terms of implications of the study.

HYPOTHESIS

Based on review of literature and past studies the following Hypotheses have been formulated for verification of this study through empirical investigation.

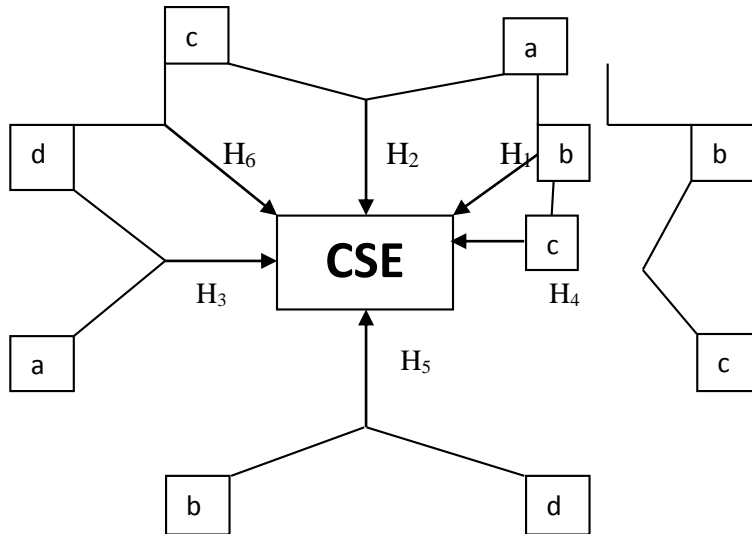


Figure 2: Pictorial Model for Hypothesis

- a = Male having age less than or equal 40.
- b = Male having age above 40.
- c = Female having age less than or equal 40.
- d = Female having age above 40.

H₁: There is no significance difference in male having age less than or equal 40 and male having age above 40 in terms of CSE.

H₂: There is no significance difference in male having age less than or equal 40 and female having age less than or equal 40 in terms of CSE.

H₃: There is no significance difference in male having age less than or equal 40 and female having age above 40 in terms of CSE.

H₄: There is no significance difference in male having age above 40 and female having age less than or equal 40 in terms of CSE.

H₅: There is no significance difference in male having age above 40 and female having age above 40 in terms of CSE.

H₆: There is no significance difference in female having age less than or equal 40 and female having age above 40 in terms of CSE.

THE STUDY

The present study is a comparative investigation to examine the impact of gender (independent variable) and age (independent variable) on computer self efficacy (dependent variable). The study will be undertaken to understand the effect of independent variables on the dependent variable with '2 x 2' bivariate factorial constitution

	Age >40	Age ≤40
Male	a	b
Female	c	d

Figure 3: Bivariate Factorial on impact of gender and age on computer self efficacy

- a = Male having age less than or equal 40.
- b = Male having age above 40.
- c = Female having age less than or equal 40.
- d = Female having age above 40.

THE SAMPLE

The present research was conducted on a sample of 100 faculty / staff members from educational institutes of Indore. The respondents were selected on a convenience sampling basis.

The Tools:

(a) For Data Collection:

The research was carried out through survey method. A well structured, close ended and well designed questionnaire was utilized to get clear idea of respondents' perception. The respondents were asked to respond on 'Likert Scale' (Five Point Scale) ranging from "Strongly Disagree" to "Strongly Agree". Cronbach's Alpha Test (Cronbach, 1951) was applied to check reliability before the questionnaire was administered for the final survey. An Alpha Coefficient of 0.70 is considered to be good reliability estimate of the instrument. In the present study, the Alpha Coefficient Value is found to be 0.76 (Refer Annexure – 1).

(b) *The Tools for Data Analysis:*

The analysis of collected data was carried out using MS Excel and Statistical Package for Social Science (SPSS 12.0). The final scale was subjected to independent sample t-Test.

RESULT AND DISCUSSIONS

H₁: There is no significance difference in male having age less than or equal 40 and male having age above 40 in terms of CSE.

H₁. Stands Accepted

The result indicated in the table that there was no significant difference in male having age less than or equal 40 and male having age above 40 in terms of CSE. A Z-test reveals the statistically reliable difference between the mean of

man having age above 40(M=3.61, SD= 0.37) and that of man having age below 40 (M= 4.06, SD= 0.35), with the conditions $t(48) = 4.343, p = .591$.

Table Group Statistics

Age	N	Mean	Std. Deviation	Std. Error Mean
CSE Male Above 40	25	3.6176	.37653	.07531
Male below 40	25	4.0668	.35447	.07089

Table Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CSE Equal variances assumed	.292	.591	-4.343	48	.000	-.44920	.10343	-.65715	-.24125
Equal variances not assumed			-4.343	47.826	.000	-.44920	.10343	-.65717	-.24123

H₂: There is no significance difference in male having age less than or equal 40 and female having age less than or equal 40 in terms of CSE.

H₂. Stands Accepted

The result indicated in the table that there was no significant difference in male having age less than or equal 40 and female having age less than or equal 40 in terms of CSE. A Z-test reveals the statistically no reliable difference between the mean of male having age below 40(M=4.06, SD= 0.35) and that of female having age below 40 (M= 3.99, SD= 0.32), with the conditions $t(48) = 0.74, p = .459$.

Table Group Statistics

Age	N	Mean	Std. Deviation	Std. Error Mean
CSE Male below 40	25	4.0668	.35447	.07089
Female below 40	25	3.9948	.32716	.06543

Table Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CS Equal variances assumed	.156	.695	.746	48	.459	.07200	.09647	-.12197	.26597
Equal variances not assumed			.746	47.695	.459	.07200	.09647	-.12201	.26601

Table Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CSE Equal variances assumed	.156	.695	.746	48	.459	.07200	.09647	-.12197	.26597
Equal variances not assumed			.746	47.695	.459	.07200	.09647	-.12201	.26601

H3: There is no significance difference in male having age less than or equal 40 and female having age above 40 in terms of CSE.

H3. Stands Rejected

The result indicated in the table that there was significant difference in male having age less than or equal 40 and female having age above 40 in terms of CSE. A Z-test reveals the statistically reliable difference between the mean of man having age below 40 ($M=4.06, SD= 0.35$) and that of female having age above 40 ($M= 3.77, SD= 0.38$), with the conditions $t(48) = 2.811, p = .007$.

Table Group Statistics

Age	N	Mean	Std. Deviation	Std. Error Mean
CSE Male below 40	25	4.0668	.35447	.07089
Female above 40	25	3.7732	.38346	.07669

Table Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CSE Equal variances assumed	.807	.374	2.811	48	.007	.29360	.10444	.08361	.50359
Equal variances not assumed			2.811	47.706	.007	.29360	.10444	.08358	.50362

H₄: There is no significance difference in male having age above 40 and female having age less than or equal 40 in terms of CSE.

H₄ Stands Rejected

The result indicated in the table that there was significant difference in male having age above 40 and female having age below 40 in terms of CSE. A Z-test reveals the statistically reliable difference between the mean of male having age above 40 (M=3.61, SD= 0.37) and that of female having age below 40 (M= 3.99, SD= 0.32), with the conditions $t(48) = 3.781, p = .000$.

Group Statistics

AGE	N	Mean	Std. Deviation	Std. Error Mean
CSE Male above 40	25	3.6176	.37653	.07531
Female below 40	25	3.9948	.32716	.06543

Table Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CSE Equal variances assumed	.935	.338	-3.781	48	.000	-.37720	.09976	-.57779	-.17661
Equal variances not assumed			-3.781	47.082	.000	-.37720	.09976	-.57789	-.17651

H5: There is no significance difference in male having age above 40 and female having age above 40 in terms of CSE.

H5. Stands Rejected

The result indicated in the table that there was significant difference in male having age above 40 and female having age above 40 in terms of CSE. A Z-test reveals the statistically reliable difference between the mean of man having age above 40 (**M=4.06, SD= 0.35**) and that of female having age above 40 (**M= 3.77, SD= 0.38**), with the conditions $t(48) = 2.811, p = .007$.

Group Statistics

Age	N	Mean	Std. Deviation	Std. Error Mean
CSE Male above 40	25	4.0668	.35447	.07089
Female above 40	25	3.7732	.38346	.07669

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
CS E Equal variances assumed	.807	.374	2.811	48	.007	.29360	.10444	.08361	.50359
Equal variances not assumed			2.811	47.706	.007	.29360	.10444	.08358	.50362

H6: There is no significance difference in female having age less than or equal 40 and female having age above 40 in terms of CSE.

H6. Stands Rejected

The result indicated in the table that there was significant difference in female having age above 40 and female having age below 40 in terms of CSE. A Z-test reveals the statistically reliable difference between the mean of female having

age below 40 ($M=3.99$, $SD= 0.32$) and that of female having age above 40 ($M= 3.77$, $SD= 0.33$), with the conditions $t(48) = 2.198$, $p = .033$.

Group Statistics

Age	N	Mean	Std. Deviation	Std. Error Mean
CSE Female below 40	25	3.9948	.32716	.06543
Female above 40	25	3.7732	.38346	.07669

Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CS E	Equal variances assumed	1.865	.178	2.198	48	.033	.22160	.10081	.01891	.42429
	Equal variances not assumed			2.198	46.839	.033	.22160	.10081	.01878	.42442

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ANNEXURE -1**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.705	.768	16

ANNEXURE -2

COMPUTER SELF-EFFICACY SCALE

Computer Self-Efficacy :- Computer Self-Efficacy refers to individual confidence in one’s capability to use a computer with respect to skill acquisition.

Name : _____ Gender : Male Female

Age : Above 40 years Below or equal to 40 years

- 1) I have a lot of self confidence when it comes to working with computer.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 2) Computer is a fast and efficient means of gaining information.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 3) Computers can eliminate a lot of tedious work for people.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 4) Computer are easy to understand and motivating to work with.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 5) Having good knowledge of computer will increase my job possibilities
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 6) I could get good grades in computer courses.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 7) I am sure , I could learn any computer language.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 8) I don’t understand how some people can spend so much time working with computers and seem to enjoy it.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 9) I feel comfortable in basic computer troubleshooting.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 10) I can easily install general software in computer.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 11) Computer applications are beneficial to us.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 12) Computer reduced manual work to a immense extent
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 13) After some time we will become totally dependent on computers.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 14) Computers are dehumanizing to society.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree
- 15) I am comfortable in understanding terms/words relating to computer hardware/software.
1) Strongly Disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree