IJITCE

ISSN 2347- 3657

International Journal of Information Technology & Computer Engineering

Email : ijitce.editor@gmail.com or editor@ijitce.com

International Journal of Information Technology & Computer Engineering

ISSN 2347–3657
Volume3,Issue 2,April 2015

Computer playfulness and anxiety: positive and negative mediators of the system experience effect on perceived ease of use

Jangali Murnalini Yadav

Abstract

An information system's perceived ease of use is a major factor in both the prediction and determination of the user's choice to utilize the system. As users develop confidence and understanding via hands-on experience, they see the system as simpler to operate. Using a sample of 116 people who use electronic spreadsheets, our study found that system experience correlates with ease of use, as measured by both positive (computer fun) and negative (computer fear) reactions. Perceived ease of use was substantially connected to system experience, as one would anticipate. Anxieties and playfulness with computers were identified as important moderators of the relationship between system experience and usability. But computer fear was the sole mediator of the impact, showing that user response on the negative end is more powerful than on the good end. Furthermore, it is recommended to apply treatments that were discovered to affect computer anxiety as a mediator in order to improve perceptions of ease of use.

Keywords: Computer anxiety; Computer playfulness; Ease of use; System experience; Technology acceptance; IS implementation

1INTRODUCTION

Information systems (IS) are useless until they are put to use, which will lead to the productivity increases and organizational advantages that are promised. One of the important difficulties recognized by IS executives [33] and scholars [9] is the acceptance and usage of IS. If information system users find a system to be too complicated, they are less inclined to embrace or use it. Among the several models that have been developed, the technology acceptance model (TAM) [8] has seen the greatest amount of use. existing literature on the topic of IT user acceptance and behavior proposes that perceived ease of use is a key factor in people's intentions to use the system, and there is substantial empirical evidence to support the idea that perceived ease of use is a critical predictor of users' technology acceptance behavior [42,44].As users develop confidence and expertise via hands-on experience, they tend to view the system as simpler to use. The most important factor in increasing one's self-confidence in achieving effective performance levels is enactive mastery gained via direct experience, according to social cognitive theory [2]. Previous research on acceptance found that experience played an important role in an individual's decision to use the system [39],

Assistante Professor, Department Of Mechanical Engineering, Holy Mary Institute Of Technology And Science, Telangana,

ISSN 2347–3657
Volume3,Issue 2,April 2015

and the amount of experience was positively related to the individual's perception that it was easy to use [20]. However, it is unclear whether the increased experi- ence improves perceived ease of use by augmenting positive feelings toward the technology or by reducing negative feelings against it. From a practical perspec-tive, the answer to this question allows the designer to direct limited resources to producing more effective training interventions that foster desirable user per- ceptions of IS. For example, depending on the training objective, it might be more appropriate to provide game-based training [41] to enhance positive feelingsthan to develop modeling-based training [6,36] to reduce negative feelings; however, the opposite strat- egy may be better in other situations.Our study involved 116 novice and expert users of a spreadsheet program (i.e. Microsoft Excel). It exam- ined the effects of system experience on perceived ease of use as affected by playfulness and anxiety. Prior IS research has examined the playfulness and anxiety constructs to understand individual reactionsto computer systems [17,47], but few studies, if any,have directly compared and contrasted them to under- stand the impact of experience on user perceptions. Building upon prior work on user acceptance of IS, this study seeks to advance our understanding of theeffects of system experience on perceived ease of use via both the positive (i.e. playfulness) and negative (i.e. anxiety) routes of affective responses.

1. Research hypotheses

1.1. System experience and perceived ease of use

Perceived ease of use is defined as the extent to
which a person believes that using a technology will be free of effort [7]. Computer users change their ease ofuse perceptions about a particular system over time.They may see a computer system as difficult to use when they first interact with it because they are not equipped with the necessary skills and confidence. As they build up their techniques and become familiar with the system, most users develop more favorableperceptions of its ease of use. Kanfer and Ackerman [23], and Kanfer et al. [24] provide a theoretical reasoning for the correlation between user experience and the impression of simplicity of use. Users are needed to exert a considerable deal of cognitive attentional effort during the early stages of skill acquisition, according to their theory of resource allocation, as they are acquiring the necessary information to carry out the activity. The demands on users' attentional systems are significantly decreased when they learn skills via practicing and "automatizing" sequences of cognitive and motor activities. This frees up cognitive resources for a secondary activity. Because of this, individuals tend to think that the work and the technology are simpler than they really are as they gain expertise and their abilities are automated. This is because the task becomes less reliant on cognitive resources.

According to several studies, people's impressions of a system's usability are heavily influenced by their own personal experiences with the system. As an example, Igbaria et al. [19] discovered that, for both the split-half data and the holdout, the judgment of ease of use was strongly influenced by computer expertise (b 0:13, P 0:001 and b 0:10, P 0:01).

each group, in addition to the impacts ofPerceived ease of use is influenced by organizational support and system quality. Igbaria et al. [22] also found a significant detrimental impact (b 0:32,Influence (P < 0.001) of competence in using computers on the impressionsystem complexity (as opposed to user-friendliness)pulling from their poll results. Moreover, the work of Thompson et al.According to the study, there is a substantial correlation of 0.45 between computer experience and computer use, as well as a direct influence of experience on utilization (b 0:23, P < 0:005) and indirect effects that are mediated by other intervening factors. According to the results, people's perceptions of the system's ease of use and their actual usage of the system are positively correlated with their level of system experience. In light of the results,

ISSN 2347–3657
Volume3,Issue 2,April 2015

We propose the following hypothesis:

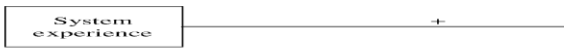
Hypothesis 1: Perceived ease of use is positively and significantly affected by system experience.2.2. Computer-induced amusementThe term "computer playfulness" describes how people often engage in unplanned interactions with computers [45]. You can think of it as a mental condition orcertain aspect of a person. A person's fleeting mental condition is related to the transient nature of the experience. A trait is a representation of an individual's feature that may be both stable and subject to gradual change over time. In this research, we use the term "playfulness" to describe a system-specific attribute that might evolve as a result of repeated exposure to a certain technological platform. Even when someone is usually lighthearted, the amount of lightheartedness they display while interacting with a certain piece of technology might vary greatly. Prior IS work [50] supports this viewpoint.Users tend to be less fun when interacting with a computer system for the first time because they are anxious and scared [30,48]. They are more likely to investigate the system and engage with it spontaneously as they get more acquainted with it. In four separate investigations including both students and IS workers, Webster and MartocchioWith a correlation value ranging from 0.37 to 0.51, [46] discovered a substantial link between computer experience and computer fun. My name is Venkatesh.Recently, researchers compared game-based training to traditional training and found that consumers evaluated game-based training as more easier to use. Although the research did not evaluate actual degrees of fun, he reasoned that this resulted in more positive impressions of ease of use due to the method's ability to produce a greater level of playfulness and boost users' intrinsic drive. The results indicate that users' perceptions of the system's complexity are greatly affected by their level of familiarity with it, and that this in turn affects how playful they are with the system. As a result, our theory is:Hypothesis 2: Perceived ease of use is moderated by system experience to a large extent via playfulness.Problems with computers (2.3)Anxieties are common among computer users, according to studies, particularly when first engaging with computers [13]. Users often get past their initial fears and form positive impressions as they get more used to the system's interface and features. Anxiety related to computers may be described as the feeling of unease or worry that a person has when confronted withwhen faced with the prospect of implementing an IS [37]. According to social cognitive theory, while it's true that emotional arousal can be a performance-killer, the confidence one gains from gaining mastery of a task through direct experience more than makes up for any short-term setbacks.There is strong evidence that gradually increasing one's level of computer expertise may alleviate computer anxiety [26]. A significant connection of 0.28 (P < 0:001) was found between computer anxiety and Igbaria and Chakrabarti's [18] report on computer experience. Computer anxiety was identified as the most significant predictor of unfavorable attitude toward computers among the participants in a separate study conducted by Igbaria and Parasuraman [21].variables related to demographics, personality, and cognitive style. College students who had never used a computer before reported higher levels of computer-related anxiety compared to their more experienced peers, according to research by Necessary and Parish [32]. These results indicate that users' experiences with the system help alleviate their worry about it, and that users' opinions regarding the system are strongly impacted by their level of computer fear. Our hypothesis is based on the idea that simplicity of use is a key factor in how people feel about a piece of technology [29].Third Hypothesis: Anxiety plays a key mediating role between system experience and the perceived ease of use.All things considered, the literature points to computer anxiety and computer playfulness as intermediary processes between system experience and usability. But nobody really knows what they mean. Also, the magnitudes of the mediation effects between them have not been evaluated. The study's working hypotheses are summarized in Figure 1.

3. Research

Microsoft Excel was chosen as the target system for the field investigation because of its widespread usage in commercial organizations. Two separate procedures were used to conduct the research. The process began with the development of a survey instrument and its pilot survey among 55 undergraduates at a prominent institution in the Southeastern US.

International Journal of Information Technology & Computer Engineering
ISSN 2347–3657
Volume3,Issue 2,April 2015

H1: System experience has a significant (positive) effect



H2: Playfulness significantly mediates the effect of syste

¼

H3: Anxiety significantly mediates the effect of system e

The survey instrument was then refined, based on the respondent feedback. Next, the new survey was administered to 116 graduate and upper level under-graduate students enrolled in an IS course at the same university (on a volunteer basis).

Respondents were 70% male and 30% female with a mean age of 30 years. Since it was important to haveadequate variance in the sample, the survey was administered after all subjects had had some exposure to Excel through class exercises, although some had previously used the software. The respondents had an average of 5.6 years of work experience. Consistent with previous research [7,46], all the measures of system experience, computer playfulness, computer anxiety, and perceived ease of use were situation- specific. That is, the questions were all related tothe target Excel system.

According to Morrision and Brantner [31], experience is not an objective time-based function, but ratheran individual's perception. Thompson et al. [40] argue that, within the context of IT use, expertise is the most relevant component of experience because it is related to the quality of time spent using the system. More recently, King and Xia [25] used time, competency,and comfort as components of experience with respectto media technologies. These studies indicate thatexperience can be measured by capturing each user'sperception of his or her expertise with regard to a specific IT application. Thus, our study measured experience by asking participants to self-select their level of expertise with Excel. In addition, consistent with past research [27] that used categorical measures of experience, participants were asked to read descrip- tions of three expertise levels (novice, intermediate, and expert) and choose the level with which they most closely identified.

Forty three percent of the respondents (*n* 50) self-selected themselves as expert Microsoft Excel users. The remaining respondents classified themselves as either novice (*n* 12) or intermediate (*n* 54). Because the number of novice users was very small, and non-significant differences were found between the novice and intermediate categories across the study variables of playfulness (*t* 0:07, *P* 0:94, ns)¼anxiety (*t* ¼ 1:32, *P* 0:19, ns), and ease of use¼(*t* 1:78, *P* 0:08, ns), the two categories were

combined to form a non-expert group to be distin-
guished from the expert group.

As suggested by Webster and Martocchio [46], the playfulness measure consisted of seven items that described how subjects would characterize themselves when interacting with the system study showed that the computer confidence sub-dimension consisting of nine items was the most reliable and dominant factor, those confidence items were adopted in the final survey. One confidence item (''Using Excel is very difficult for me'') was dropped because of its similarity to the ease of use items.

The perceived ease of use construct was measured with four items adopted from the instrument devel- oped by Davis et al. [7]. As with the playfulness and anxiety items, the ease of use items were measured on a scale of 1 (strongly agree) to 7 (strongly disagree). The Appendix A shows the instruments used to mea-sure the study variables of system experience, com- puter playfulness, computer anxiety, and perceived ease of use.

2. Results

Cronbach alpha measures of internal consistency reliability were acceptable at 0.76 for playfulness, 0.92 for anxiety, and 0.96 for ease of use [34]. Table 1 presents the factor analysis performed on the playfulness and anxiety items. The factors, under- lying variables that reflect combinations of observable variables, were extracted using the principal compo- nents method (varimax rotation), which is an optimum approach to condensation prior to rotation. The table clearly shows that the two-factor solution (factor 1: anxiety, factor 2: playfulness) is appropriate and the items display desirable convergent and discriminant validity. None of the anxiety items load more highly onto the playfulness factor and none of the playfulness items load more highly onto the anxiety factor (dis-criminant validity). The items that belong to the same construct show high loading scores (convergent valid- ity). As expected, the results

¼ ¼ ¼ ¼ —

International Journal of Information Technology & Computer Engineering

ISSN 2347–3657
Volume3,Issue 2,April 2015

show that anxiety and

No good	0.86	—0.20
Not the type to do well	0.64	—0.27
Do not feel threatened	0.45	0.12
Computer playfulness		
Spontaneous	0.13	0.80
Unimaginative	—0.28	0.31
Flexible	—0.33	0.58
Creative	—0.18	0.72
Playful	0.18	0.68
Unoriginal	—0.26	0.58
Uninventive	—0.36	0.59

playfulness constructs are distinct, measuring differ- ent aspects of user responses. One playfulness item loaded at 0.31 within its construct, a lower score than the recommended 0.4 [15]. Given that it is not sub- stantially different from the criteria and is only one item, it was retained. Overall, the psychometric prop- erties of the measures were more than adequate.

The proposed mediation hypotheses were tested using a statistical technique suggested by Baron and Kenny [3]. According to them, the following condi- tions must hold in order to establish mediation: (1) a significant relationship exists between the indepen- dent variable and the dependent variable; (2) a sig- nificant relationship exists between the independent variable and the presumed mediator; and (3) in the presence of a significant relationship between the mediator and the dependent variable, the previous significant relationship between the independent vari- able and the dependent variable is no longer signifi- cant or the strength of the relationship is significantly decreased.

H1 hypothesized that system experience has a sig-nificant positive effect on perceived ease of use. As shown in Fig. 2 and Table 2, the effect of experience on perceived ease of use was significant (b ¼ 0:30,

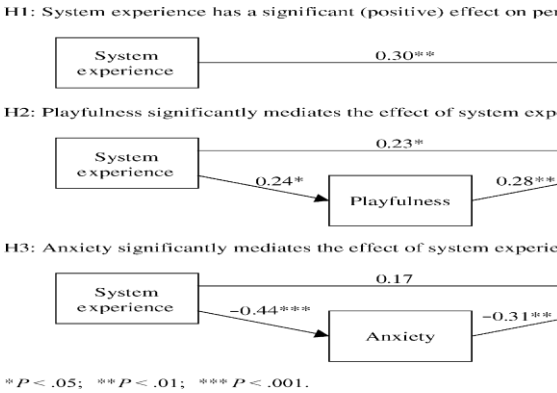
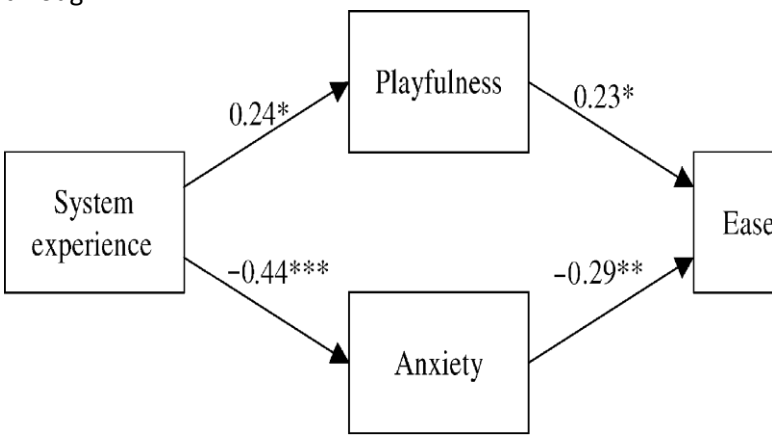


Fig. 2. Regression results of the research models.

$P < 0:01$), supporting H1. H2 and H3 hypothesized that the effect of system experience on perceived ease of use would be significantly mediated by computer playfulness and computer anxiety, respectively. The link between system experience and playfulness was significant (b 0:24, $P < 0:05$). When ease of use was regressed on both playfulness and experience, a significant relationship was found between systemexperience and ease of use (b 0:23, $P < 0:05$), as well as between playfulness and ease of use (b 0:28, $P < 0:01$). Although the effect of experience on ease of use was still significant, the strength of the effect was reduced (from b 0:30, $P < 0:01$ to b 0:23, $P < 0:05$) when playfulness was included as a med- iator, thus partially supporting H2. However, the indirect effect of experience on ease of use through



*P < .05; **P < .01; ***P < .001.

ISSN 2347–3657
Volume3,Issue 2,April 2015

ease of use (0.23) was much more affected by experience than by playfulness (0:24 0:28 0:07). On the other hand, H3 had complete backing. A substantial correlation (b 0:44, P < 0:001) was seen between system experience and anxiety. Based on the results of the regression analysis, it was shown that anxiety significantly correlated with ease of use (b 0:31, P < 0.01), while system experience no longer had a significant correlation with ease of use (b 0:17, ns), suggesting that there was complete mediation.

The relative magnitude of the media-tion effects were compared by regressing ease of use on both playfulness and anxiety simultaneously. There was a 2.3-fold difference between the effects mediated by anxiety (0:44 0:29 0:13) and playfulness (0:24 0:23 0:06), as seen in Figure 3.Leaving out the individuals that were part of the beginnergroup of users, we examined the hypothesis testing's robustness by doing an extra study between the expert and intermediate users. In line with earlier findings, the ease of use was significantly impacted by system experience (b 0:26, P < 0:01).the presence of anxiousness (b), playfulness (b 0:24, P < 0.05), and0:001 (at 0:41). When we regressed usability on experience and fun, we foundshowed only partial mediation, since there were significant relationships between system experience and ease of use (b 0:20, P < 0:05) and between playfulness and ease of use (b 0:27, P < 0:01), respectively. Alternatively, in cases whereThe ease of use was shown to be significantly related to both anxiety and experience when the usage of the product was regressed on both variables. However, when the relationship between experience and ease of use was no longer significant, it was determined that complete mediation had occurred.

5.1. Results summary

To determine whether system experience affects perceived ease of use via positive or negative user emotions, this study set out to track the impact of system experience on perceived ease of use via playfulness and anxiety. Perceived ease of use was significantly associated to system experience, supporting the idea that more seasoned users would have a more favorable impression of the system's usability. The influence of system experience on perceived ease of use was moderated by both anxiety and fun. When these two factors were included, prior experience was no longer a strong predictor of usability. A szajnaAccording to [38], one valuable way to enhance TAM is to include a variable that takes user experience into consideration. Our research shows that familiarity with the system is a key factor in usability, but that it doesn't affect usability much beyond the impacts that anxiety and playfulness mitigate.It is worth mentioning that whereas computer fun was only partially mediating, computer worry was a complete mediator. Anxiety had more than double the indirect influence of system experience on usability as did fun. Perceived ease of use may be better attained by reducing anxiety via system experience rather than by generating spontaneous fun emotions. Similarly, Galletta studied the effects of peer influence in a self-paced computer training environment in an experiment.According to research by et al. [12], trainees' learning results were more adversely affected by negative word-of-mouth remarks than positive ones. None of the remarks, positive or negative, had any more impact than silence.We discovered that worry was a greater antecedent of ease of use than fun, although both were significant. Anxiety had a higher and more consistent influence on usability than fun, according to a recent research [42] that looked for antecedents of ease of use. Nonetheless, the two studies vary in a number of important respects with regard to the measurements used. At the level of general computing, the other research captured individuals' impressions of computer usage in general and examined fear

ISSN 2347–3657
Volume3,Issue 2,April 2015

and fun. Each metric in our analysis has its own unique systemic link. We were also able to more accurately compare the impacts of playfulness and anxiety on ease of use since we examined these factors separately, excluding superfluous variations caused by other variables. Finally, both research measured anxiety differently but playfulness the same way. Notwithstanding these dissimilarities, the two research strengthen each other and provide more weight to the findings.

5.21 Restrictions

It is important to mention that the research had some limitations. The first issue was that it did not track how users' emotions changed over time. Every action was executed simultaneously. The second issue is that the research only tested one piece of software, thus any conclusions drawn from it need to be double-checked on other platforms. Lastly, whether people use technology at home or at work could affect their nervous emotions or fun behaviors differently. Differentiating the use parameters was not done in the research. Past research on user acceptability of technology has shown that in contexts where use is necessary, a distinct set of processes are at work than in settings where usage is discretionary [16,43].When it comes to user acceptance research, TAM offers a concise and highly predictive depiction of the essential concepts. On the other hand, managers and system developers looking to guarantee the effective adoption of technology will not find any concrete recommendations in it. Considering IS's growing significance in the modern world, theGiven the wide range of technologies at our fingertips and the speed with which new ones are being adopted, it is essential to comprehend the factors that contributed to their user-friendliness. Recent research has sought to expand TAM by integrating a number of aspects, including control, emotion, perceived pleasure, objective usability, innovative characteristics, and intrinsic motivation, acknowledging the significance of this problem [42,43]. Positive (i.e., fun) and negative (i.e., anxious) user reactions moderate the relationship between system experience and ease of use; our work adds to the expanding body of knowledge on this topic.

5.3. What actionable steps should managers take

Our research indicates that strategies to alleviate anxiety should be a part of any program, curriculum, or policy that aims to improve people's ability to utilize technology effectively. Generally speaking, research indicates that computer anxiety may be effectively managed by establishing a calm environment free of time constraints and selecting software that is easy to use [35], offering carefully monitored, failsafe projects [49], and making use of online, non-intrusive training [4]. There was a significant reduction in computer fear when Martocchio [28] created an environment where learners felt they could improve upon their current skills. According to Martocchio, those who thought they could change or adapt saw training as a chance for growth, while those who thought they couldn't change or adapt saw it as a danger.Another possible advantage is making an effort to create a space that encourages fun. Before integrating new software into their regular routines, users should be permitted to explore (free play), according to several research [10]. Software designs that include "game playing" and user-friendly iconography may help break up monotony and capitalize on users' fun nature, which in turn can increase the likelihood that new systems will be accepted. Fisher [11] shown that groups who enjoyed themselves during training via games and comedy were more likely to utilize the system regularly and with greater adventure one month after the training. Reframing the training situation as "fun" or "play" rather than "work" might also influence the user's psychological state, allowing for less stress and pressure and more playful conduct

ISSN 2347–3657
Volume3,Issue 2,April 2015

[47].A new training method called behavioral modeling seems to contain training components that can reduce anxious feelings and possibly enhance playful reactions. There are many alternative implementations of training, such as computer-based approaches, instruction, and hands-on exploration. This approach is based on the tenet that one may learn by seeing the actions of an exemplary person (vicarious learning), then applying what one has learned via practice and the encouragement of others around them when one successfully exhibits the desired behavior [14]. The main point is to make it such that good emotions (excitement, want to learn) may flourish while bad ones (fear of failing, anxiety, boredom) can flourish in the setting [5]. When it comes to the positive parts of training, this method agrees with our findings. According to social cognitive theory, one's psychological moods, social persuasion, real and vicarious experience, and other factors all play a role in shaping one's self-efficacy assessments. Incorporating these elements into a training strategy would include giving users the opportunity to see others do the desired activities, to succeed independently, and to get positive reinforcement from others. In addition to facilitating positive emotions via exploration and hands-on experience, the behavior modeling framework helps the user to feel less nervous through physical demonstration, guided manipulation, and social reinforcement.

6. Final Thoughts

An individual's propensity to adopt new technologies is heavily influenced by their perceptions of how easy such technologies are to use. This study expanded on previous work on IS user acceptability by looking at the relationship between system experience and perceived ease of use, and whether computer fear or computer fun mediated this impact significantly. The data demonstrated that the assumptions were correct and that anxiety, in particular, had a substantial mediating role. result a variable that completely mediates the influence of experience on perceived ease of use is a noteworthy result, considering how long it takes for a user to become an expert on a target system. To improve the perception of ease of use, one may implement treatments that are known to affect the mediating variable.reduces the time and cost, since it does not depend only on expertise. Consequently, our study's results pave the way for more potent and economical approaches to achieving effective user adoption of IT.

References

[1] D. Bandalos, J. Benson, Testing the factor structure invariance of a computer attitude scale over two grouping conditions, Educational and Psychological Measurement 50, 1990, pp. 49–60.
[2] A. Bandura, Social Foundations of Thought and Action: A Social Cognitive Theory, Prentice-Hall, NJ, 1986.
[3] R.M. Baron, D. Kenny, The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations, Journal of Personalityand Social Psychology 51 (6), 1986, pp. 1173–1182.
[4] V. Bartlett, Technostress and librarians, Library Administration and Management 9 (4), 1995, pp. 226–230.
[5] R.D. Bretz, R.E. Thompsett, Comparing traditional and integrative learning methods in organizational training programs, Journal of Applied Psychology 77 (6), 1992, pp. 941–951.
[6] D.R. Compeau, C.A. Higgins, Application of social cognitive theory to training for computer skills, Information Systems Research 6 (2), 1995, pp. 118–143.
[7] F.D. Davis, Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly 13(3), 1989, pp. 319–340.
[8] F.D. Davis, R.P. Bagozzi, P.R. Warshaw, User acceptance of computer technology: a comparison of two theoretical models, Management Science 35 (8), 1989, pp. 982–1003.
[9] W.H. DeLone, E.R. McLean, Information systems success: the quest for the dependent variable, Information Systems Research 3 (1), 1992, pp. 60–95.
[10] T.J. Deloughry, 2 Researchers say technophobia may afflict millions of students, The Chronicle of Higher Education 39 (34), 1993, pp. A25–A26.
[11] J. Fisher, Using perceived fun to reduce computer anxiety amongst new adult users, in: Proceedings of the Second International Cyberspace Conference on Ergonomics, Perth, 1999.
[12] D.F. Galletta, M. Ahuja, A. Hartman, T. Teo, A.G. Peace, Social influence and end-user training, Communications of the ACM 38 (7), 1995, pp. 70–79.
[13] R. Ganzel, Feeling Squeezed by technology? Training 35 (4), 1998, pp. 62–70.
[14] A.P. Goldstein, M. Sorcher, Changing Supervisor Behavior, Pergamon, NY, 1974.
[15] J.F. Hair, R.E. Anderson, R.L. Tatham, W.C. Black, Multi-

ISSN 2347–3657
Volume3,Issue 2,April 2015

variate Data Analysis with Readings, Prentice-Hall, NJ, 1992.

[16] J. Hartwick, H. Barki, Explaining the role of user participation in information system use, Management Science 40 (4), 1994, pp. 440–465.

[17] G.S. Howard, R.D. Smith, Computer anxiety in management: myth or reality? Communications of the ACM 29 (7), 1986, pp. 611–615.

[18] M. Igbaria, A. Chakrabarti, Computer anxiety and attitudes towards microcomputer use, Behaviour & Information Technology 9 (3), 1990, pp. 229–241.

[19] M. Igbaria, T. Guimaraes, G.B. Davis, Testing the determinants of microcomputer usage via a structural equation model, Journal of Management Information Systems 11 (4), 1995, pp. 87–114.

[20] M. Igbaria, J. Iivari, The effects of self-efficacy on computer usage, Omega 23 (6), 1995, pp. 587–605.

[21] M. Igbaria, S. Parasuraman, A path analytic study of indivi- dual characteristics, computer anxiety and attitudes toward microcomputers, Journal of Management 15 (3), 1989, pp. 373–388.

[22] M. Igbaria, S. Parasuraman, J.J. Baroudi, A motivational model of microcomputer usage, Journal of Management Information Systems 13 (1), 1996, pp. 127–143.

[23] R. Kanfer, P.L. Ackerman, Motivation and cognitive abilities: an integrative/aptitude-treatment interaction approach to skill acquisition, Journal of Applied Psychology—Monograph 74 (4), 1989, pp. 657–690.

[24] R. Kanfer, P.L. Ackerman, T.C. Murtha, B. Dugdale, L. Nelson, Goal setting, conditions of practice, and task performance: a resource allocation perspective, Journal of Applied Psychology 79, 1994, pp. 826–835.

[25] R.C. King, W. Xia, Media appropriateness: effects of experience on communication media choice, Decision Sciences 28(4), 1997, pp. 877–910.

[26] M. Liu, W. Reed, P. Phillips, Teacher education students and computers: gender, major, prior computer experience, occur- rence, and anxiety, Journal of Research on Computing inEducation 24 (4), 1992, pp. 457–467.

[27] J.M. Mackay, C.W. Lamb, Training needs of novices and experts with referent experience and task domain knowledge, Information & Management 20 (3), 1991, pp. 183–189.

[28] J.J. Martocchio, Effects of conceptions of ability on anxiety, self-efficacy, and learning in training, Journal of Applied Psychology 79 (6), 1994, pp. 819–825.

[29] K. Mathieson, Predicting user intentions: comparing the technology acceptance model with the theory of planned beha-vior, Information Systems Research 2 (3), 1991, pp. 173–191.

[30] T. McCarroll, What new age? Time 138 (6), 1991, pp. 44–46.

[31] R.F. Morrision, T.M. Brantner, What enhances or inhibits learning a new job? a basic career issue, Journal of Applied Psychology 77 (6), 1992, pp. 926–940.

[32] J.R. Necessary, T.H. Parish, The relationship between computer usage and computer-related attitudes and behaviors,Education 116 (3), 1996, pp. 384–387.

[33] F. Niederman, J.C. Brancheau, J.C. Wetherbe, Information systems management issues for the 1990s, MIS Quarterly 15(4), 1991, pp. 475–500.

[34] J.C. Nunnally, Psychometric Theory, 2nd Edition, McGraw-Hill, New York, 1978.

[35] B. Quinn, Reducing stressful aspects of information technol- ogy in public services, Public and Access Services Quarterly1 (4), 1995, pp. 1–34.

[36] S. Simon, V. Grover, J. Teng, K. Whitcomb, The relationship of information system training methods and cognitive abilityto end-user satisfaction, comprehension, and skill transfer: alongitudinal field study, Information Systems Research 7 (4), 1996, pp. 466–490.

[37] M.R. Simonson, M. Maurer, M. Montag-Torardi, M. Whitaker, Development of a standardized test of computer literacy