

Engineering students' anxiety of computer, Internet and foreign language

Haviluddin†, Dyah Sunggingwati†, Aji P. Wibawa‡ & Felix A. Dwiyanto‡

Mulawarman University, Samarinda, Indonesia†

State University of Malang, Malang, Indonesia‡

ABSTRACT: The use of ICT in education is undeniable and the link between language education and technology grows stronger. Although, ICT is generally perceived to be beneficial, some students might experience challenges to deal with it as part of their anxiety. This study reports on the Internet, computer and foreign language anxiety of undergraduate engineering students in Mulawarman University (MU), Samarinda, Indonesia. The students were involved in a survey questionnaire that was part of this study. The results have shown that most students have little Internet and computer anxiety, as most of their responses indicated preference and motivation for work with computers, and recognition of the importance and ease of use of the Internet. However, they still experienced foreign language anxiety with approximately 70% of the students anxious when they were in the English language class. As the respondents of this study were from the Engineering Department at MU, it was hypothesised that they would have limited foreign language anxiety; however, the students were still anxious when learning English, particularly when they needed to perform in front of their friends or were afraid of making mistakes.

Keywords: Engineering students, Internet, computer and foreign language anxiety

INTRODUCTION

Language is a key factor in computer system interfaces and much of computer use entails language usage, including reading general information on the Internet, seeking news and professional information, following hyperlinks or searching for educational sources. Thus, language proficiency in relation to the Internet and computer would lead to a more advantageous use of these technologies.

As English is the dominant language in computer usage and the Internet, it is reasonable to argue that those who are more successful in learning English may experience less anxiety when they are working with computers and *vice versa*. So, students that have language problems and low English proficiency may be particularly vulnerable to experiencing anxiety in computer use [1].

Spielberger characterised anxiety as tension, apprehension and worry related to an unpleasant emotional situation [2]. Meanwhile, Presno [3] and Joiner et al [4] focused specifically on Internet anxiety and defined it as tension or fear, which occurs while using the Internet or interacting with other people via the Internet [3][4]. In other studies it was reported that perceived Internet usefulness, enjoyment and efficacy are negatively linked to Internet anxiety [5], and that viewing the Internet as a supportive resource and having trust in the technology have the same effect [6].

Häkkinen [7] and Deane et al [8] indicated that computer anxiety refers to the fear of using the computer, including limited interaction, insufficient experience and computer avoidance. The insufficient experience covers the frequency and the level of computer usage, computer ownership and computer-related education or familiarity [9-11]. The meta-analysis of Chua et al revealed that computer experience is the most consistent feature linked with computer anxiety [11]. The results of previous investigations clearly indicate that the more computer experience individuals acquire, the less computer anxiety they would suffer [10-12].

Horwitz pointed out that anxiety negatively influences language learning and it is one of the most highly examined variables in all psychology and education studies [13]. Along this line, Ortega emphasised that some individuals report experiencing apprehension, tension or fear when they learn a foreign language [14]. Moreover, Horwitz underlined that foreign language anxiety is a distinct complex of self-perceptions, beliefs, feelings and behaviours related to classroom language learning arising from the uniqueness of the (foreign) language learning process [13][15]. It is particularly

relevant when foreign language proficiency is a prerequisite for continuing education or the labour market. Also, other studies concluded that high levels of anxiety usually have a negative effect on the language acquisition process [16-18].

RESEARCH METHOD

This study involved 113 students from the Engineering Department at Mulawarman University (MU), Samarinda, Indonesia, and was conducted between January and March 2022. There were 28 males and 85 females, aged 20-22. The aim of the study was to explore their level of computer, Internet and foreign language anxiety. A questionnaire survey was distributed to the students as a primary way to gather the data. The instruments used covered Internet anxiety, foreign language anxiety and computer anxiety. The Internet anxiety scale adapted from the computer anxiety scale (CAS) designed by Cohen and Waugh was employed as the second questionnaire used in this study [19]. The questionnaire includes 15 items focusing on anxiety related to the use of the Internet. Foreign language classroom anxiety scale (FLCAS) consists of 33 items indicating anxiety experienced when learning a foreign language, which in this case was English. This questionnaire was adopted from Horwitz [15]. The computer anxiety scale employed in this study was adapted from a shorter version of a seven-item form of the computer anxiety rating scale (CARS) by Miller and Rainer [20]. It has seven items focusing on the feeling of anxious in using computers.

Students were encouraged to complete the survey. They were informed that the questionnaires were confidential and the anonymity of the respondents would be maintained. The researchers applied simple descriptive statistics to show the level of Internet, computer and foreign language anxiety.

RESULTS AND ANALYSIS

About 45% of the respondents had taken an English course at some stage of their studies, while the rest had not. Most of the students accessed the Internet using their own smartphones (92%). In order to streamline analysis and discussion, the scales of the questionnaires indicating strongly agree and agree are classified as agree, which also applies to strongly disagree and disagree.

Computer Anxiety

The results of the questionnaires on computer anxiety using the CARS indicated that all 113 respondents had no worries in using the computer. Most responses revealed that students disagreed with the provided statement regarding the fear or apprehension of using a computer. More specific responses to four items are presented in Figure 1.

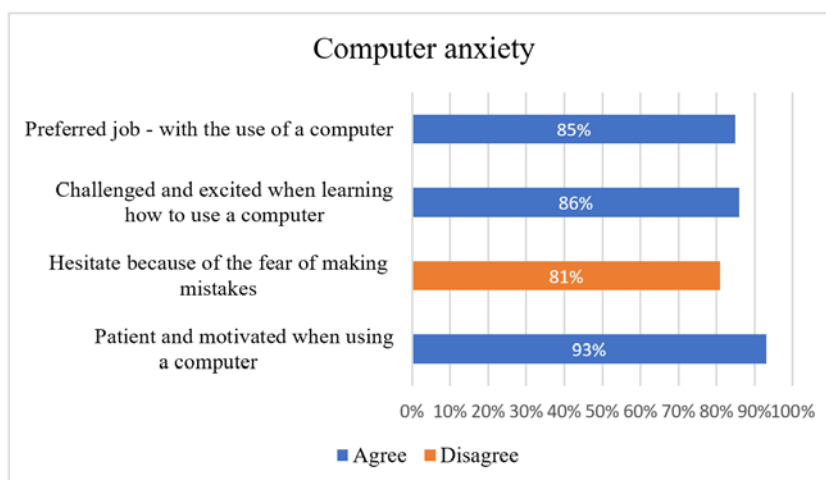


Figure 1: Computer anxiety results (the use of a computer).

The overwhelming majority of the students disagreed that they avoided computers (90.3%). Meanwhile, most of the students agreed that anyone can learn how to use a computer, if they are patient and motivated (92.9%). From Figure 1, it can be seen that students disagreed that they hesitated to use a computer because of the fear of making mistakes (81%), but they agreed that the challenge of learning computer was exciting (85.9 %) and preferred using computers in their job (85%). In addition, more than 50% of the respondents indicated that they disagreed that they had difficulty understanding the technical aspects of computers (59.3%) or felt insecure about their ability to interpret a computer printout (57.5%).

Internet Anxiety

The results of the Internet anxiety revealed that most of the students had little Internet anxiety. The vast majority of them (93%) did not feel anxious when they had to use the Internet (93%), with even higher percentage (94.7%) pointing out that the Internet was important to them. They were confident to use the Internet and found it easy to use (92.1%). They also felt calm when using it (84.1%) and happy (82.4%). Figure 2 includes the Internet anxiety results of the students in regard to five items.

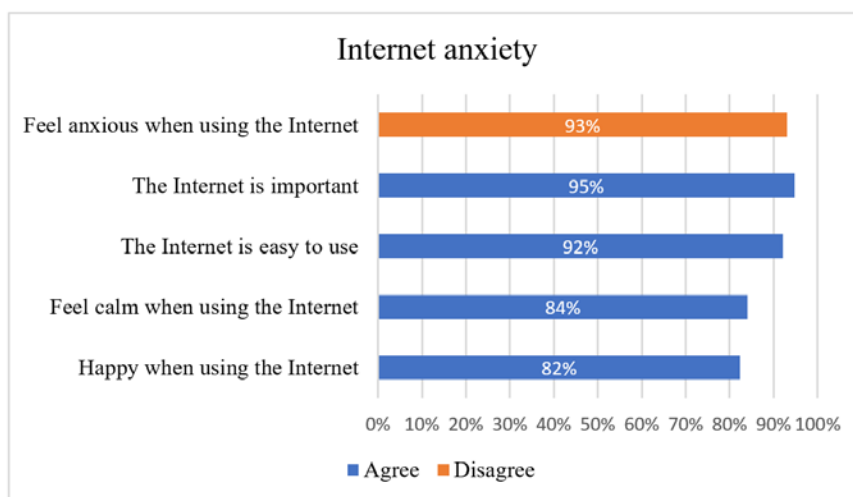


Figure 2: Internet anxiety results.

The majority of the students had sufficient knowledge and skills regarding Internet use (73.4%). The findings also indicate that students were not afraid of making mistakes when using the Internet (64.6%), with 57.5% admitting that they like wasting/spending time on the Internet.

Foreign Language Classroom Anxiety (FLCA)

Most of the respondents thought that other students were better in English than they were, and would panic when they had to speak in English without preparation (76.1%). Students also worried about the consequences of failing in the English language class (76.9%). They felt that their friends speak English better than they do (71.7%) and got nervous when the English teacher asked questions which they had not prepared in advance (71%). They felt heart pounding when they were going to be called upon in the English language class (74.3%).

In regard to the already acquired knowledge, 64.6% of the respondents were nervous when they forgot the things that they knew. Interestingly, they felt fine about attending the English class, with some of them indicating that they love going to that class. Most of them worried about getting left behind as the English class moved so quickly. They acknowledged that the more they studied for language tests, the more they understood the language. Figure 3 includes the foreign language anxiety results of the students in regard to 15 items.

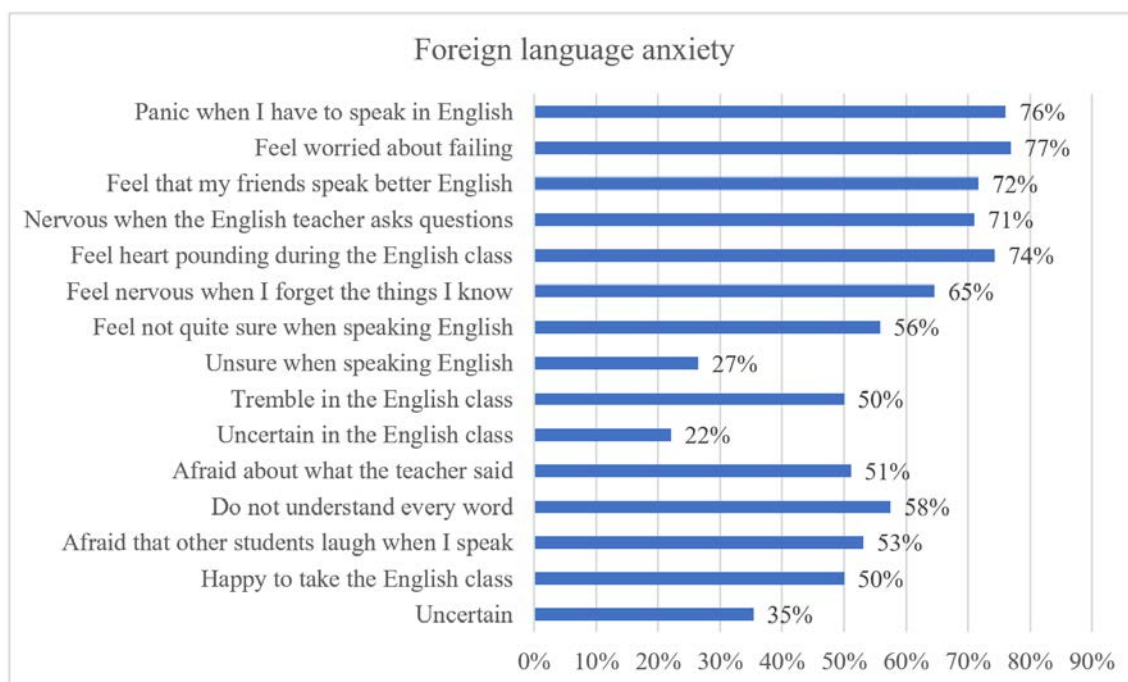


Figure 3: Foreign language anxiety results.

However, students indicated that they never felt quite sure of themselves when speaking in English (55.8%), while 26.5% were unsure. More than 50% of the students trembled when they expected to be called upon in the English class, while 22.1% were uncertain. They were afraid when they did not understand what their teacher said (51.1%). More than 50% got nervous when they did not understand every word the language teacher said (57.5%). In addition,

they were afraid that other students would laugh at them when they spoke English (53.1%), but more than 50% were happy to take more English classes, while 35.4% were uncertain.

Analysis

In this study, it was found that computer anxiety was experienced in a very limited way by students who had prior experience with computers. This finding concurs with the consulted literature on the topic, which pointed out that computer experience is the most common feature negatively related to computer anxiety [10-12][18][21]. Also, according to the results of a similar study, the highest mean computer anxiety score is related to the non-users of computers, and the lowest mean score to the daily users among all groups [10].

Regarding Internet anxiety, earlier research reported that when users perceived the Internet as beneficial and entertaining that would provide a negative link to Internet anxiety [5]. Moreover, the perception of the Internet as a source of supporting learning media and reliance on technology reduce Internet anxiety as well [6]. So, the more positive view of the Internet and technology, the lower Internet anxiety [5][6].

In this study, the results of the computer and Internet anxiety questionnaires are similar. Respondents agreed or strongly agreed that the use of a computer or the Internet was just a small challenge. In regard to the Internet, the findings of this study corresponded with an earlier study that investigated the correlation of Internet identification, Internet anxiety and Internet use [4]. The results revealed that most of the participants were not anxious about using the Internet. It was found that the participants who experienced Internet anxiety were the ones who avoided using computers [4].

The results of the foreign language anxiety questionnaires indicated that students from the Engineering Department still experienced foreign language anxiety. Although this study did not include further investigation related to the effect of foreign language anxiety on student achievement, it could be expected, to some extent, that anxiety would hinder students to be more engaged in their learning activities [13][16-18].

The level of fluency in English is substantially associated with the state of anxiety, trait anxiety, test anxiety, and also with English listening, speaking, reading and writing concerns [22]. However, contemporary students in the engineering field must continue to demonstrate proficiency in at least one foreign language at an appropriate level for professional communication [23].

The professional foreign language proficiency of engineering majors is multifaceted. The digital learning environment can be combined with various techniques, including traditional, to successfully prepare university students through English as a foreign language (EFL) classes for professional practice that requires foreign language competence. Students enrolled in technical curricula can benefit from the use of various information and communication technologies, when confronted with them during the teaching and learning process. Moreover, a project-based approach is critical, particularly when including the stakeholders who can impart their view of the importance of technology, hence participating in the creation of future engineers [24].

CONCLUSION

This study demonstrated that students are not anxious in regard to the computer and Internet use. As the participants of this study were from the Engineering Department at MU, it was hypothesised that they would have limited anxiety in regard to a foreign language. However, this study showed that engineering students still experienced anxiety in learning English, and particularly they were afraid of making mistakes or being embarrassed in front of their friends.

REFERENCES

1. Conti-Ramsden, G., Durkin, K. and Walker, A.J., Computer anxiety: a comparison of adolescents with and without a history of specific language impairment (SLI). *Computer Educ.*, 54, 1, 136-145 (2010).
2. Spielberger, C.D., Gorsuch, R.L. and Lushene, R.E., STAI manual for the state-trait anxiety inventory. Self-Evaluation Questionnaire. *APA PsycTests*. (1983).
3. Presno, C., Taking the byte out of Internet anxiety: instructional techniques that reduce computer/Internet anxiety in the classroom. *J. of Educational Computing Research*, 18, 2, 147-161 (1998).
4. Joiner, R., Brosnan, M., Duffield, J., Gavin, J. and Maras, P., The relationship between Internet identification, Internet anxiety and Internet use. *Computers in Human Behavior*, 23, 3, 1408-1420 (2007).
5. Zhang, Y., Age, gender, and Internet attitudes among employees in the business world. *Computers in Human Behavior*, 21, 1, 1-10 (2005).
6. Thatcher, J.B., Loughry, M.L., Lim, J. and McKnight, D.H., Internet anxiety: an empirical study of the effects of personality, beliefs, and social support. *Infor. & Manage.*, 44, 4, 353-363 (2007).
7. Häkkinen, P., Changes in computer anxiety in a required computer course. *J. of Research on Computing in Educ.*, 21, 2, 141-153 (1994).
8. Deane, F.P., Henderson, R.D., Barrelle, K., Saliba, A. and Mahar, D., Construct validity of computer anxiety as measured by the Computer Attitudes Scale. *Advances in Human Factors/ergonomics*, 20, 581-586 (1995).

9. Bozionelos, N., Psychology of computer use: XXXIX. Prevalence of computer anxiety in British managers and professionals. *Psychological Reports*, 78, 3, 995-1002 (1996).
10. Gurcan-Namlu, A. and Ceyhan, E., Computer anxiety: multidimensional analysis on teacher candidates. *Educational Sciences: Theory and Practice*, 3, 2, 401-432 (2003).
11. Chua, S.L., Chen, D.T. and Wong, A.F.L., Computer anxiety and its correlates: a meta-analysis. *Computers in Human Behavior*, 15, 5, 609-623 (1999).
12. Chu, P.C. and Spires, E.E., Validating the computer anxiety rating scale: effects of cognitive style and computer courses on computer anxiety. *Computers in Human Behavior*, 7, 1-2, 7-21 (1991).
13. Horwitz, E., Language anxiety and achievement. *Annual Review of Applied Linguistics*, 21, 112-126 (2001).
14. Ortega, L., *Understanding Second Language Acquisition*. Routledge (2014).
15. Horwitz, E.K., Horwitz, M.B. and Cope, J., Foreign language classroom anxiety. *The Modern Language J.*, 70, 2, 125-132 (1986).
16. Gregersen, T.S., To err is human: a reminder to teachers of language-anxious students. *Foreign Language Annals*, 36, 1, 25-32 (2003).
17. MacIntyre, P.D. and Gardner, R.C., Methods and results in the study of anxiety and language learning: a review of the literature. *Language Learning*, 41, 1, 85-117 (1991).
18. Krashen, S., *The Input Hypothesis: Issues and Implications*. New York: Longman (1986).
19. Cohen, A. and Waugh, G.W., Assessing computer anxiety. *Psychological Reports*, 65, 3, 735-738 (1989).
20. Miller, M.D. and Rainer, R.K., Assessing and improving the dimensionality of the computer anxiety rating scale. *Educational and Psychological Measure.*, 55, 4, 652-657 (1995).
21. Koustourakis, G., Panagiotakopoulos, C. and Vergidis, D., A contribution to the Hellenic Open University: evaluation of the pedagogical practices and the use of ICT on distance education. *Inter. Review of Research in Open and Distributed Learning. Open Distance Learning*, 9, 2, 1-18 (2008).
22. Dong, M., An insight into the relationships between English proficiency test anxiety and other anxieties. *World Trans. on Engng. and Technol. Educ.*, 15, 3, 234-238 (2017).
23. Zubkov, A.D., Professional foreign language competence of technical students: content, structure and formation. *Proc. Conf. on Integrating Engng. Educ. and Humanities for Global Intercultural Perspectives*, 503-510 (2020).
24. Fernández-López, M., Exploring forward-thinking technology perspectives of sustainable development for the year 2030 in the identity of engineering students. *Global J. of Engng. Educ.*, 24, 1, 14-20 (2022).

BIOGRAPHIES



Haviluddin has been a senior lecturer in the Department of Informatics at the Faculty of Engineering, Mulawarman University, Samarinda, Indonesia, since 2002. His PhD is in the field of computer science, and it was obtained from the Faculty of Computing and Informatics at Universiti Malaysia Sabah, Malaysia. He is the coordinator of publication and intellectual property rights of the Research Institute and Community Service of Mulawarman University. He is currently a member of the Association for Scientific Computing Electronics and Engineering (ASCEE). His research interest is in the artificial intelligent area.



Dyah Sunggingwati is a lecturer and has been teaching in the English Department at the Faculty of Teacher Training and Education at Mulawarman University, Samarinda, Indonesia, since 2001. Her PhD is from the University of Queensland, Brisbane, Australia. She has published her work in local, national and international journals. Her current research interests are ELT and professional development. She enjoys working with, and providing workshops for, English teachers' organisations.



Aji Prasetya Wibawa received his PhD degree in electrical and information engineering from the University of South Australia (UniSA), Adelaide, Australia. He is currently Head of the Electrical Engineering Department, at the State University of Malang (Universitas Negeri Malang, UM), Indonesia, and a research group leader focused on knowledge engineering and data science (KEDS). His research interests include AI, data mining, machine translation and social informatics, reflected in his work for journals, such as *Knowledge Engineering and Data Science (KEDS)* and *Bulletin of Social Informatics Theory and Applications*.



Felix Andika Dwiyanto received his Bachelor's degree in informatics engineering education and the Master's degree in vocational education from the State University of Malang (Universitas Negeri Malang, UM). He is active in scientific writing for various international conferences and journals in multiple countries, including Indonesia, Germany and Thailand. His field of study is the development of information technology-based learning media, information systems and data structures. He is currently the Editor of *Belantika Pendidikan* journal.