**ORIGINAL RESEARCH PAPER**

# THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS

**Eva Gröstenberger**[1] (iD) **, Adolf Selinger**[2] (iD)

[1] *Private Pädagogische Hochschule Burgenland*, *Eisenstadt, Austria*
[2] *Private Pädagogische Hochschule Burgenland*, *Eisenstadt, Austria*

*Correspondence concerning this article should be addressed to Eva Gröstenberger - eva.groestenberger@ph-burgenland.at and Adolf Selinger - adolf.selinger@ph-burgenland.at, Private Pädagogische Hochschule Burgenland, Eisenstadt, Austria.*

## ABSTRACT

The current study examines how gender and age effect computer self-efficacy, computer anxiety and perceived enjoyment among Austrian secondary school teachers in the context of working with learning management systems. The survey was answered by 383 teachers in the midst of the Covid-crisis between December 2020 and February 2021. The results show that gender has a significant effect on computer anxiety, with female participants experiencing higher levels across all age groups. Furthermore, age emerges to make a difference in computer self-efficacy: younger teachers seem to rate their computer skills higher than their older colleagues. Based on the findings, suggestions for improvements in teacher education and training are made and the limitations of the study are discussed.

**Keywords:** computer self-efficacy, computer anxiety, perceived enjoyment, gender, age

**THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS**

*Eva Gröstenberger and Adolf Selinger*

## 1. Introduction

The last few years of the Covid pandemic have brought the integration of information and communication technology (ICT) in educational settings into sharp focus. The Covid crisis and the resulting school closures in 2020 demonstrated how unprepared many instructors were for distance learning and the use of the digital tools required. In this context, the *National Education Report Austria* (2021) outlines that this problem was not entirely due to an absence of digital devices or inadequate infrastructure, even though such external barriers evidently played a role in some school areas. In fact, the report states that many teachers were found to lack the appropriate skills to efficiently move their teaching to online formats, although the Ministry of Education as well as local school authorities had made heavy investments in the provision of digital devices and school infrastructure prior to the outbreak of the crisis.

Such an apparent shortcoming of an educational system is not only problematic in times of crises such as school closures, but has to be discussed on a larger scale. In this context, Bećirović (2023) emphasizes the need for digital pedagogy, for "digitally competent teachers who are able to impart digital skills and abilities to their students" (p. 40). This seems of particular relevance in a time of rapid technological advancement, when educational systems must assume their responsibility and prepare young people for the requirements of the new labour market (Bećirović, 2023). Accordingly, in Austria, as elsewhere, the importance to assess teachers' ability to integrate the use of technology in the classroom and by doing so implicitly transferring their skills and knowledge to their students, has received renewed attention.

On the one hand, the offer of teacher training courses focusing on the use of ICT across all subject matters has been extended. On the other hand, attempts have been made to introduce perception-based measures in the form of self-assessment tools, which allow teachers to rate their computer knowledge and skills while at the same time accessing a wealth of training opportunities for systematic competence building (Brandhofer et al., 2020). In theory, when it comes to ICT in the classroom, one may thus argue that Austrian teachers should be among the best prepared in Europe. In practice, however, there is anecdotal evidence provided by students and parents that ICT integration still varies greatly among schools and can by no means be described as standardized.

Acknowledging the fact that providing teachers with the right ICT infrastructure and training is evidently not sufficient, the *National Education Report Austria* (2021) admits that a nationwide digitalization strategy in education can only be successful if teachers are persuaded of the significance of digital media, want to use them, and are motivated to promote digital skills. Actually, the role of teachers playing a crucial role in the sustainable implementation of technological innovations in schools – regardless of the external circumstances - has already been identified by Euler et al. (2006) and has been further explored in a number of studies. For instance, Ertmer et al. (2012) identify two types of barriers that can impact teachers' use of technology. On the one hand, first-order barriers refer to external factors such as inadequate infrastructure, lack of training, or insufficient support. On the other hand, second-order barriers are internal to the teachers themselves and involve their confidence in using technology, their beliefs about teaching and learning, and their perceptions of technology's value. These internal barriers are considered to play an even more crucial role than external barriers, making the use of ICT rather a personal choice largely unaffected by the presence or absence of external resources or obstacles (Ertmer et al., 2012; Mcgrail, 2005; Mendieta, 2012; William Sugar et al., 2004).

Consequently, the challenge, it appears, is to identify which personal factors act and interact to influence a teacher's individual level of willingness to adopt technology in the classroom. This question is of particular relevance in an Austrian context, where external barriers to the use of digital media in the classroom seem to have been largely eliminated. To shed some light on this question, the current paper thus attempts to closer investigate three potentially relevant internal factors, that is computer self-efficacy, computer anxiety, and perceived enjoyment, in order to gain a better insight into teachers' attitudes towards and acceptance of ICT. As independent variables gender and age are used, as these are considered to have a substantial influence on the individual's technological responses in many ICT studies. To be more precise, gender has been argued to have an effect on the development of ICT beliefs due to gendered socialization processes (Barker & Aspray, 2006; Fisher & Margolis, 2003; Volman et al., 2005). Furthermore,

# Education and Humanities
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

age is an interesting factor to investigate, as there still is a widespread persistent prejudice against older teachers, who are believed to implement ICT less effectively than their male counterparts, while at the same time there is empirical evidence that self-efficacy increases with age (Bandura, 2006).

## 2. Literature review

In Austria, the impact of internal or personal factors on ICT usage in educational settings was the subject of a mixed-method study by Gabriel (2011), which focused on the personalities of instructors. The study evaluated the extent to which teachers at secondary commercial colleges in Burgenland, Austria, utilize learning management systems and discovered a significant relationship between the frequency of utilization and the personality trait of 'conscientiousness': teachers with greater levels of conscientiousness utilized the platform more frequently. There were no significant differences based on gender in terms of usage intensity. Similarly, the age of the participating instructors had no significant effect on usage intensity. However, Gabriel discovered that usage intensity increased with age among female instructors. In further support of the importance of the teacher as a relevant factor, Gröstenberger (2020) found that even the use of online practice materials by secondary school students varies according to their respective school or teacher. Students taught by female teachers were found to practice significantly more online than students taught by male teachers, while the teachers' teaching experience emerged as not having an effect on the students' practice behavior. Both studies establish the teacher as a decisive factor in digitally supported learning environments and support the claim that "teachers are influenced by a wide range of contextual and personal factors that affect their perception of technology and, consequently, the learning opportunities they provide their students" (Mendieta, 2012, p. 177).

On a more global scale, researchers in the field of ICT have been attempting to identify factors that influence people's acceptance and effective use of information technologies. Most prominently, Davis et al. (1989) devised the Technology Acceptance Model (TAM) to explain users' behavioral intentions towards adopting a technological innovation. Within this model, internal and external factors that can potentially influence the individual's technology adoption are considered, among them computer self-efficacy, computer anxiety, and perceived enjoyment. These three constructs are gen-

erally considered critical factors in determining an individual's ability to face the challenges and to take advantage of the opportunities of an increasingly digital world. They draw heavily on Bandura's (1986) social cognitive theory, which emphasizes the importance of self-beliefs in influencing human behavior. To be more precise, computer self-efficacy is defined as the "degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer", computer anxiety refers to the degree of "an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers", while perceived enjoyment is considered to measure the extent to which "the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" (Venkatesh & Bala, 2008, p. 7).

To start with, computer self-efficacy is part of the general construct of self-efficacy (Bandura, 1977) and must be examined with regard to a specific tool or device in a specific context (He & Freeman, 2010). As can be expected, higher levels of computer self-efficacy lead to higher levels of computer use across a number of educational disciplines across different countries (Aktağ & Tuzcuoğlu, 2016; Awofala et al., 2017; Compeau & Higgins, 1995; Teo, 2008). In their study with North American undergraduate business students, He and Freeman (2010) examined computer self-efficacy in relation to gender and age. Based on the assumption that "computing has developed a masculine image on par with traditionally masculinized subjects such as mathematics, physics and engineering" (p. 230), they expected their male participants to have higher levels of computer-self-efficacy. However, this hypothesis was refuted. However, age emerged as an important antecedent of computer-self-efficacy, which is in line with general self-efficacy increasing with age or rather experience (Bandura, 2006). Moreover, He and Freeman (2010) examined the potential predictors of computer self-efficacy and found computer anxiety to be one of them.

Computer anxiety is based on the larger general concept of anxiety, which Arnold and Brown (1999) regard as "quite possibly the most pervasive affective factor that impedes the learning process" (p. 8) and as such also plays a significant role in the educational usage of computers (Chua et al., 1999). Its apparent counterpart, that is perceived enjoyment, constitutes the third variable under investigation in the current study. It was first included into the measurement of ICT acceptance in the

### Education and Humanities
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) and refers to the construct of hedonic motivation, that is fun or pleasure resulting from using a technology. In general, anxiety as a negative emotion is associated with worry, concern and nervousness, often linked to low self-esteem, risk aversion, and inhibition and can be experienced by degree (Brown, 2007). Moreover, computer anxiety is a 'trait' rather than a 'state' anxiety (Oxford, 1999), inherent to a specific situation involving computers (or other digital devices) and can thus be changed and influenced. Simsek (2011) examined the relationship between computer anxiety and computer self-efficacy among Turkish elementary and secondary teachers and students. He established a significant, moderate, negative correlation between computer self-efficacy and computer anxiety and found male participants to display lower levels of computer anxiety and higher levels of computer self-efficacy in comparison to their female counterparts. As for significant differences in male and female computer anxiety levels, there is global evidence that females generally experience higher levels (Awofala et al., 2020; Mcilroy et al., 2001; Moradi Rekabdarkolaei & Amuei, 2008; Sultan & Kanwal, 2017).

## 3. Methodology

The present study investigates the relationship between computer self-efficacy (CSE), computer anxiety (CANX) and perceived enjoyment (ENJ) among Austrian secondary teachers in the context of using learning management systems. Furthermore, the influence of gender and age on CSE, CANX and ENJ are examined. The following hypotheses are tested:

**Hypothesis 1:** There is a correlation between computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

**Hypothesis 2:** Gender and age do not significantly interact in the effect on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

**Hypothesis 3:** There is a significant effect of gender on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

**Hypothesis 4:** There is a significant effect of age on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

### 3.1 Instruments

For the survey, the questionnaire is divided into two sections: items from Venkatesh & Bala (2008) TAM 3 and demographic data. The TAM questionnaire consists of 17 variables with 73 items. For the current paper, CSE, CANX and ENJ are taken into account. For all items of the independent variables a 7-Point-Likert-Scale with the following format was used:

1. strongly disagree
2. moderately disagree
3. somewhat disagree
4. neutral (neither disagree nor agree)
5. somewhat agree
6. moderately agree
7. strongly agree

The demographic information includes the participants' gender, year of birth, years of teaching experience, academic field, level of education (i.e. bachelor's, master's, PhD, or other), type of teacher training institution, and location and school type.

### 3.2 Participants

The online survey was completed by 383 participants (male: N = 153; female: N = 228; other: N = 2). Because the third group (other) is so small, only the groupings for men and women are taken into account in further calculations, where gender is concerned. The participants were grouped in three groups according to their age in 2021: age group 1 (up to 35 years), age group 2 (36 to 50 years) and age group 3 (older than 51 years). Teachers under the age of 35 make up the smallest age group (N = 48, 12.6%), followed by those between the ages of 36 and 50 (N = 138, 36.2%). More than half of the participants (N = 195, 51.2%) are over the age of 51. According to current statistics, the distribution of age in the study essentially corresponds with the overall age structure of

## Education and Humanities
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

Austrian teachers (age up to 34: 24.1%, 35-49: 34.1% and 50: 41.7%) (*Lehrpersonen in Österreich*, 2023).

### 3.3 Procedure

The Open Source program LimeSurvey was used to collect the data through an online survey between December 2020 and February 2021. The questionnaire was issued to 6,385 secondary school teachers with active accounts on the PH-Online-Platform (www.ph-online.ac.at/ph-bgld), where teachers have to register for in-service training courses. The sample size should be at least 3683 when taking into account a level of 99% confidence, a margin of error of 0.02, and a population of roughly 32,000 teachers ($z = 2.58$, $p = .5$, $e = .02$, $N = 32,000$). The sample size should be at least 381 when taking into account a confidence interval of 95%, a margin of error of 0.05, and a population of roughly 32,000 teachers ($z = 1.96$, $p=5$, $e = .05$, $N = 32,000$).

### 3.4 Data analysis

A structural model that satisfies the suggested cut-off criteria for the chosen fit indices was found after a confirmatory factor analysis was used to verify the measurement model. The data was examined and descriptive statistics, standard deviation, means, analysis of variance (MANOVA) and correlations were calculated. AMOS 27 was used to calculate the variables CSE, CANX and ENJ. With the use of SPSS 27, all further calculations were done based on these variables.

In order to investigate whether gender and age significantly interact in the effect on CSE, CANX and ENJ a factorial MANOVA was performed. To be more precise, a two-way MANOVA was conducted to determine the influence of the two independent variables gender and age on the teachers' scores on a linear combination of these dependent variables and on each of them separately.

### 4. Results

To start with descriptive data on CSE, teachers under 35 (M = 5.55, SD = .88) have higher mean values than their colleagues between 36 and 50 (M = 4.83, SD = 1.26) and score higher than teachers older than 51 (M = 4.89, SD = 1.29). As for gender, the male participants (M = 4.93, SD = 1.30) display slightly higher CSE levels than their female counterparts (M = 4.86, SD = 1.28). Notably, in the group of teachers older than 51, there is almost no difference in CSE scores between female (M = 4.74, SD = 1.34) and male (M = 4.78, SD = 1.45) participants. In contrast, among middle-aged teachers (f: M = 4.68, SD = 1.25; m: M = 5.05, SD =1.26), the difference between male and female CSE levels is more prominent. Most interestingly, the pattern is reversed when it comes to the youngest group of teachers: in this age group women (M = 5.63, SD = .77) rate their CSE higher than men (M = 5.34, SD = 1.12.).

Second, the mean values for CANX increases as teachers get older (age group 1: M = 3.18, SD = .48; age group 2: M = 3.36, SD =.72; age group 3: M = 3.41, SD =.68). That is to say, younger teachers are less fearful of using computers than older ones. As for gender, female teachers (M = 3.44, SD = .74) across all age groups experience higher CANX levels than their male counterparts (M = 3.25, SD = .56): age group 1 (f: M = 3.23, SD = .52; m: M = 3.05, SD = .31), age group 2 (f: M = 3.52, SD = .85; m: M = 3.12, SD = .37), age group 3 (f: M = 3.45, SD = .70; m: M = 3.36, SD = .66). Accordingly, the most anxious teacher (M = 3.52, SD = 0.85) is female and between 36 and 50 years of age; the least anxious person (M = 3.05, SD = 0.31) is male and under 35 years of age.

Third, ENJ varies with age: the mean values for younger instructors (M = 5.68, SD = 1.06) are higher than those for age group 3 (M = 5.39, SD=1.40), followed by age group 2 (M = 5.29, SD = 1.44). Notably, female teachers in the youngest (M = 5.79, SD = .97) and oldest group (M = 5.52, SD =1.28) enjoy using the LMS more than male teachers (group 1: M = 5.39, SD = 1.28; group 3: M = 5.21, SD = 1.54). By comparison, in age group 2, male teachers (M = 5.46, SD = 1.38) score higher on ENJ than female teachers (M = 5.18, SD = 1.48).

To examine the first research question, a Pearson correlation coefficient was computed to assess the relationship between CSE, CANX and ENJ. CANX and ENJ were found to have a statistically significant moderate relationship ($r = -.45$, $p < .001$). The same is true for CANX and CSE ($r = -.39$, $p < .001$) as well as CSE and ENJ ($r = .50$, $p < .001$). (Table 1) Hypothesis 1 can thus be confirmed.

As concerns the second hypothesis, there is no statistically significant interaction effect between gender and age on a linear combination of CSE, CANX and ENJ: $F (6, 746) = 1.11$, $p = .35$; Wilk's $\Lambda = 0.98$. Similarly, when considering the variables separately, gender and age do not interact on CSE $[(F(2,375) = 1.24, p = .29)]$, CANX $[(F(2,375) = 2.08, p = .13)]$ or ENJ $[(F(2,375) = 2.13, p = .12)]$. The second hypothesis can be confirmed.

*Education and Humanities*
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

**Table 1.**
*Correlations between CSE, CANX and ENJ*

|  | N | M | SD | CSE | CANX | ENJ |
|---|---|---|---|---|---|---|
| CSE | 381 | 4.89 | 1.29 | – |  |  |
| CANX | 381 | 3.36 | .68 | −.39** | – |  |
| ENJ | 381 | 5.39 | 1.38 | .50** | −.45** | – |

**. Correlation is significant at the 0.01 level (2-tailed).

To examine the question whether CSE, CANX and ENJ vary significantly with gender in the context of using learning management systems (hypothesis 3) a MANOVA was calculated. There was a statistically significant difference in gender on the combination of all three variables: $F$ (3, 373) = 3.56, $p$ = .01; Wilk's $\Lambda$ = 0.97, partial $\eta^2$ = .03. To be more precise, the results demonstrate that the effect of gender is significant on CANX $[F(1, 375) = 6.13, p = .01]$ with a low effect size ($\eta^2$ = .02). For CSE $[F(1, 375) = .05, p = .83]$ and ENJ $[F(1, 375) = .63, p = .43]$ no significant effects based on gender could be found (Table 2).

**Table 2.**
*The effect of gender and age on CSE, CANX, ENJ*

|  |  | F(1,375) | $p$ | $\eta^2$ |
|---|---|---|---|---|
| Gender | CSE | .05 | .83 | .00 |
|  | CANX | 6.13 | .01 | .02 |
|  | ENJ | .63 | .43 | .00 |
| Age | CSE | 5.21 | .01 | .03 |
|  | CANX | 2.69 | .07 | .01 |
|  | ENJ | .57 | .57 | .00 |

To test if there is a significant effect of age on the teachers' CSE, CANX and ENJ in the context of using learning management systems (hypothesis 4) a MANOVA was conducted. There is a statistically significant difference in age on the combined variable (CSE, CANX and ENJ) $F$ (6, 746) = 2.36, $p$ = .03; Wilk's $\Lambda$ = 0.96, partial $\eta^2$ = .02. It also revealed that there is a statistically significant difference in CSE based on age: $F(2,375) = 5.21, p < .01$ (Table 2). A Bonferroni test for multiple comparisons found that the mean value of CSE was significantly different between teachers in age group 1 and age group 2 ($p$ = .002, 95% C.I. = .21, 1.23) and between teachers in age group 1 and age group 3 ($p < .001$, 95% C.I. = .31, 1.29). As for CANX and ENJ, no statistically significant differences could be found (Table 3).

**Table 3.**
*Bonferroni Test for multiple comparisons*

|  | Age Group |  | Mean Difference (I-J) | SE | $p$ | 95% C.I. Lower Bound | 95% C.I. Upper Bound |
|---|---|---|---|---|---|---|---|
| CSE | 1 | 2 | .72* | .21 | .002 | .21 | 1.23 |
|  |  | 3 | .79* | .20 | < .001 | .30 | 1.28 |
|  | 2 | 1 | −.72* | .21 | .002 | −1.23 | −.21 |
|  |  | 3 | .07 | .14 | 1.000 | −.27 | .41 |
|  | 3 | 1 | −.79* | .20 | < .001 | −1.28 | −.30 |
|  |  | 2 | −.07 | .14 | 1.000 | −.41 | .27 |

*. The mean difference is significant at the .05 level.

## 5. Discussion

The present study establishes a correlation between computer self-efficacy, computer anxiety and perceived enjoyment, thereby confirming previous research results (Davis et al., 1989; He & Freeman, 2010; Simsek, 2011; Venkatesh et al., 2003). Moreover, in line with previous studies (Awofala et al., 2020; Mcilroy et al., 2001; Moradi Rekabdarkolaei & Amuei, 2008; Simsek, 2011; Sultan & Kanwal, 2017), female participants of all age groups score significantly higher on the computer anxiety scale than their male counterparts. This finding, however, cannot be related to significantly lower female computer self-efficacy levels. As in He and Freeman's study (2010), there are no significant differences between the male and the female computer self-efficacy scores. In fact, the group that rated their computer self-efficacy highest are actually women under 35 (M = 5.63, SD = 0.25). This is in itself an interesting outcome, as this group of participants seems to believe more strongly in their ability to use computers efficiently than their male counterparts, even though the latter display lower computer anxiety levels. One may thus argue that in this particular age group, i.e., teachers under the age of 35, computer anxiety is not a predictor of computer self-efficacy, which contradicts He and Freeman's (2010) findings. Further research is required to investigate this age group more closely to identify the factors that lead to the participants' perceptions of their ICT knowledge.

As for age differences, computer self-efficacy emerges to be influenced by age. That is to say, the older the teachers, the lower their computer self-efficacy. Indeed, such findings are in line with common age bias in the area of ICT usage and

# Education and Humanities
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

bring to mind outdated notions of "digital natives", i.e. younger people that have grown up with digital devices and thus show more skills, competence and confidence in their usage, and "digital immigrants", in this case the older generation of teachers that grew up without being surrounded by technology and thus supposedly has to adapt to it (Prensky, 2001).

What is more, the results of this study show that self-efficacy does not necessarily increase with experience or age (Bandura, 2006). This claim may not hold true in the specific context of educational technology use and might be explained with the fast-moving world of ICT, in which experience that you earn might be obsolete and no longer applicable in a very short time. In this context, teacher training institutions might want to rethink the delivery of their training programmes in order for teachers not to lag behind technological innovations. Furthermore, considering the fact that teacher training might have an effect on computer self-efficacy, one might want to explore this point further and investigate whether the computer self-efficacy differences might be due to the change in teacher training opportunities as well as infrastructure improvements that have been under way in the last decade. Further research is needed to explore whether such factors might account for the apparent computer self-efficacy age gap.

## 6. Conclusion

Above all, there are evidently many factors that might influence the individual teacher's beliefs in their ICT competence and skills as well as their attitude towards technology. The present study has tried to consider two of them, i.e. gender and age, and its results must accordingly be put into perspective. Admittedly, the results could be biased by the fact that the survey was conducted during school lockdowns, which might have influenced the participants' responses. Moreover, the fact that the survey was carried out online might have been an additional obstacle for teachers with higher computer anxiety who might thus not have participated.

Notwithstanding, the study shows that an examination of self-beliefs might support teacher training institutions to tailor ICT training courses to their specific target groups. One may argue that investments in such diagnostic procedures might be more successful than mere investments in ICT infrastructure or training courses that do not consider individual differences. In this context, comput-

er self-efficacy, in particular, seems a variable that should be given more attention in further research. To gain a more holistic picture, it might be worth considering more factors than can potentially influence this construct, such as the teacher training institution and the respective extent of curricular ICT integration, the ICT school policy, the school's staff development policy or the teachers' work experience. Above all, the rapid technological development requires innovative training formats, for example peer groups, professional learning groups or networks across different age groups, that can quickly and continuously help teachers to keep up with new technological challenges. Such measures might enhance the quality and efficiency of pre-service and in-service teacher training and turn teachers into life-long learning role-models for their students.

## 7. References

Aktağ, I., & Tuzcuoğlu, S. (2016). Turkish students' computer self-efficacy from colleges of physical education and sports. *Journal of Human Sciences*, *13*, 1770. https://doi.org/10.14687/ijhs.v13i1.3606

Arnold, J., & Brown, H. D. (1999). A map of the terrain. *Affect in Language Learning*, 1–24.

Awofala, A., Akinoso, S., & Fatade, A. (2017). Attitudes towards Computer and Computer Self-Efficacy as Predictors of Preservice Mathematics Teachers' Computer Anxiety. *Acta Didactica Napocensia*, *10*, 91–108. https://doi.org/10.24193/adn.10.3.9

Awofala, A., Olabiyi, O., Arigbabu, A., Fatade, A., & Uchenna, N. (2020). Attitudes toward Computer, Computer Anxiety and Gender as determinants of Pre-service Science, Technology, and Mathematics Teachers' Computer Self-efficacy. *Digital Education Review*, *36*, 51–67. https://doi.org/10.1344/der.2019.36.51-67

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

# Education and Humanities
by MAP - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT
AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents, (Vol. 5.* (p. :307-337). Information Age Publishing.

Barker, L., & Aspray, W. (2006). *1 The State of Research on Girls and IT.* https://doi.org/10.7551/mitpress/9780262033459.003.0001

Bećirović, S. (2023). *Digital Pedagogy.* Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0444-0

Brandhofer, G., Miglbauer, M., Fikisz, W., Höfler, E., & Fares, K. (2020). *Die Weiterentwicklung des Kompetenzrasters digi.kompP für Pädagog*innen* (pp. 51–71). https://doi.org/10.5771/9783748906247-51

Brown, H. D. (2007). *Principles of Language Learning and Teaching.* Pearson Longman. https://books.google.at/books?id=jUF0QgAACAAJ

Chua, S., Chen, D.-T., & Wong, A. (1999). Computer anxiety and its correlates: A meta-analysis. *Computers in Human Behavior*, *15*, 609–623. https://doi.org/10.1016/S0747-5632(99)00039-4

Compeau, D. R., & Higgins, C. A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Q.*, *19*(2), 189–211. https://doi.org/10.2307/249688

Davis, F., Bagozzi, R., & Warshaw, P. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, *35*, 982–1003. https://doi.org/10.1287/mnsc.35.8.982

Ertmer, P., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, *59*, 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Euler, D., Hasanbegovic, J., Kerres, M., & Seufert, S. (2006). *Handbuch der Kompetenzentwicklung für E-Learning Innovationen.* Hans Huber Verlag. http://verlag.hanshuber.com/vkat/einzeltitel.php?isbn=3-456-84392-5

Fisher, A., & Margolis, J. (2003). Unlocking the clubhouse: Women in computing. *ACM SIGCSE Bulletin*, *35*, .23. https://doi.org/10.1145/792548.611896

Gabriel, H. (2011). *Implementierung von Innovationen in Schulen am Beispiel des Lernmanagementsystems Burgenland. Empirische Analyse auf Mesoebene an Handelsakademien zur Erforschung wesentlicher Einflussfaktoren der Nutzungsintensit.t als zentraler Indikator des Implementierungserfolges.* WU Wien.

Gröstenberger, E. (2020). Ist moderner Fremdsprachenunterricht noch „Lehrersache"? Eine empirische Untersuchung zur Frage nach der Wichtigkeit der Schule und der Lehrperson angesichts der zunehmenden Digitalisierung des Fremdsprachenunterrichts. *Phpublico*, *06*, 47–53.

He, J., & Freeman, L. (2010). Understanding the Formation of General Computer Self-Efficacy. *Communications of the Association for Information Systems*, *26*, 225–244. https://doi.org/10.17705/1CAIS.02612

*Lerhpersonen in Österreich.* (2023). Statistik Austria. https://www.statistik.at/statistiken/bevoelkerung-und-soziales/bildung/lehrpersonen

Mcgrail, E. (2005). Teachers, Technology, and Change: English Teachers' Perspectives. *Journal of Technology and Teacher Education*, *13*.

Mcilroy, D., Bunting, B., Tierney, K., & Gordon, M. (2001). Relation of gender and background experience to self-reported computing anxieties and cognitions. *Computers in Human Behavior*, *17*, 21–33. https://doi.org/10.1016/S0747-5632(00)00037-6

Mendieta, J. (2012). Blended learning and the language teacher: A literature review. *Colombian Applied Linguistics Journal*, *14*, 163–180. https://doi.org/10.14483/udistrital.jour.calj.2012.2.a10

Moradi Rekabdarkolaei, S., & Amuei, F. (2008). Evaluation of ICT literacy differences in trainee student teachers from the view of sexuality. *Campus-Wide Information Systems*, *25*(3), 176–188. https://doi.org/10.1108/10650740810886349

*National Education Report Austria 2021.* (2021). Federal Ministry of Education, Science and Research (BMBWF).

Oxford, R. L. (1999). Anxiety and the Language Learner: New Insights. *Affect in Language Learning*, 58–67.

# Education and Humanities
by **MAP** - *Multidisciplinary Academic Publishing*

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS
*Eva Gröstenberger and Adolf Selinger*

Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, *9*(5), 1–6. https://doi.org/10.1108/10748120110424816

Simsek, A. (2011). The Relationship between Computer Anxiety and Computer Self-Efficacy. *Contemporary Educational Technology*, *2*. https://doi.org/10.30935/cedtech/6052

Sultan, S., & Kanwal, F. (2017). *Personal Attributes Contributing to Computer Anxiety and Computer Self-Efficacy among Distance Learners.*

Teo, T. (2008). Assessing the computer attitudes of students: An Asian perspective. *Computers in Human Behavior*, *24*, 1634–1642. https://doi.org/10.1016/j.chb.2007.06.004

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, *39*, 273–315.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, *27*(3), 425–478.

Volman, M., Eck, E., Heemskerk, I., & Kuiper, E. (2005). New Technologies, New Differences. Gender and Ethnic Differences in Pupils' Use of ICT in Primary and Secondary Education. *Computers & Education*, *45*, 35–55. https://doi.org/10.1016/j.compedu.2004.03.001

William Sugar, Frank Crawley, & Bethann Fine. (2004). Examining Teachers' Decisions To Adopt New Technology. *Journal of Educational Technology & Society*, *7*(4), 201–213. JSTOR.