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# The role of computer self-efficacy in the workplace

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ABSTRACT

Computer self-efficacy is a pivotal factor in the modern workplace, intertwined with the capacity of the workforce to function effectively and achieve organizational objectives. This study aims to introduce and apply an established computer self-efficacy scale in a novel cultural milieu, seeking to discern the levels of computer self-efficacy among employees while exploring its associations with various control variables, with a specific emphasis on gender. Data collection was accomplished through the distribution of a 12-item scale administered online, which garnered responses from 320 participants. Contrary to prior investigations, the present study revealed no significant disparities in computer self-efficacy between male and female employees. Furthermore, no substantial variations were detected among other control variables, including age, job position, salary, and educational background. This research distinguishes itself through the translation and adaptation of the questionnaire to the Albanian language within a workplace context, setting it apart from previous studies that predominantly focused on student or trainee samples. However, it is worth noting that this research is constrained by its exclusive consideration of computer self-efficacy as a continuous variable, without addressing antecedent and consequent variables.



## 1. Introduction

Nowadays, the use of computers connected to the Internet is essential for the modern workplace. In most cases, employees halt their work when their technology is out of use (Rasool et al., 2022). The necessity to use the computer is self-evident, and every employee must have the skill to work with it proficiently because this digital technology has made human work easier and has increased productivity at levels never seen before (Fernald and Ramnath, 2004). However, many find it very challenging to use computers fluently and often ask for help from IT support or even colleagues for very easy tasks. If general self-efficacy yields desired outcomes in task objectives, it may then be said the efficacy in computer use will bring better results at work, as the myriad of tasks are conducted through it.

As for today, computer self-efficacy (CSE) as a scientific construct has been researched in relation to various variables. Some studies have examined whether there is a difference between gender and level of computer self-efficacy (Cassidy and Eachus, 2002), how computer self-efficacy affects teaching and online learning (Chen, 2017), the impact of stress and anxiety on the decision to use technology (Thatcher and Perrewé, 2002), among others. However, there is still a significant gap in understanding computer self-efficacy in the workplace, particularly in terms of confidence in effectively using computers, as mere usage does not necessarily imply efficacy. Despite much research, studies have thus far failed to establish a definitive link between computer self-efficacy and several key variables in the workplace context at least.

Therefore, this study aims, firstly, to translate and adapt the computer self-efficacy scale developed by Howard (2014) into the Albanian language. Secondly, it aims to investigate whether employees from this cultural setting exhibit high levels of computer self-efficacy. Finally, the study intends to test hypotheses related to gender and other control variables, including age, work position, salary, and education. Because of the cost and complexity, researchers have mainly conducted their studies using samples of students and trainees (Karsten, et al., 2012). However, this study focuses solely on employees, aiming to understand computer self-efficacy in the workplace. Additionally, the study

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presents the main current findings in the field of computer self-efficacy, and discussion and conclusions follow at the end of the study.

## 2. Literature review

### 2.1. General and specific computer self-efficacy

Computer self-efficacy (CSE), as a scientific construct in information systems, is usually treated at two levels: General CSE and Specific CSE. General CSE means psychological confidence in the skills to use computers in general, while Specific CSE means confidence in the skills to perform more specific computer programs, for example, MS Excel (Claggett and Goodhue, 2011). In the Information Systems (IS) literature, researchers have primarily focused on general CSF, following Bandura's perspective of self-efficacy as a general construct rather than a sub-category of skills (Bandura, 1986). However, Gist views self-efficacy more as skills rather than self-confidence (Gist, 1987) which has had an impact on IS research. As a result, the emphasis on computer self-efficacy later shifted toward specific CSE, potentially deviating from its main goal (Claggett and Goodhue, 2011). Therefore, there is still a need for research to focus on the area of general CSE. The specific focus of this research is on general CSE because if an employee has a high level of general CSE, they are likely to also have a high level of specific CSE (Agarwal et al., 2000), or if not, they can easily learn to use it.

CSE gained significant momentum, especially after the creation of its measure by Murphy et al. (1989) (Gupta and Bostrom, 2019). They developed a scale that aims to measure General, not Specific CSE. Their development of a scale aimed to measure general CSE proved to be a valuable tool in understanding individuals' overall computer self-efficacy. However, as research progressed, the focus gradually shifted toward specific CSE, particularly due to the influential contributions of researchers such as Marakas et al. (1998), Marakas et al. (2007), and Johnson and Marakas (2000). As a result of these two streams of research, the idea has emerged that general and specific CSE should be regarded as distinct concepts. One does not simply represent the other. However, in some studies, it has been demonstrated that general and specific CSE exhibit a strong positive connection, potentially overlapping each other (Hauser et al., 2012; Agarwal et al., 2000).

As we emphasized above, if an employee has high general self-efficacy, this can also predict specific self-efficacy. However, it is important to understand the nuances of specific CSE, as it can be highly beneficial in many contexts. While some employees may utilize specialized application programs, particularly in fields such as finance, in general, employees are accustomed to using commonly known operating systems (Windows or Mac) and application programs (Microsoft Office or Google Workspace). Nevertheless, it is crucial to recognize that CSE is understood as a multi-level construct, requiring careful consideration of each level according to the context (Gupta and Bostrom, 2019).

### 2.2. Computer self-efficacy among employees in Kosovo

From the perspective of Kosovo, there has been an extraordinary trend of technology adoption, particularly with computers, since the end of the war in 1999 and beyond. One positive indicator is that Kosovo boasts the highest internet coverage in the region (WBG, 2023), demonstrating widespread computer usage both at home and in workplaces. Although direct research on Computer Self-Efficacy (CSE) in Kosovo is lacking, general research on Information Systems (IS) and Information and Communication Technology (ICT) provides insights into computer usage in the country. For instance, studies have highlighted that the use of technology has led to increased productivity in small and medium-sized enterprises in Kosovo (Berisha-Shaqir, 2005). Furthermore, there is evidence of a positive relationship between information technology usage and enterprise innovation (Neziraj et al., 2018). Also, considering the demographic data of Kosovo, where the younger generations constitute a significant portion of the population, it can be assumed that computer efficiency in Kosovo is at a high level.

**H1:** Employees in Kosovo have a high level of computer self-efficacy.

### 2.3. Computer self-efficacy and gender

Interestingly enough, studies on CSE have recognized gender as a significant variable, and extensive research has been conducted to comprehend the differences between men and women. Through this lens, researchers have sought to understand the underlying factors contributing to variations in computer self-efficacy between genders. It is generally assumed that CSE is a masculine trait, leading to the expectation that men would exhibit higher levels of CSE compared to women (Murphy et al., 1989). Only a limited number of studies have yielded contrasting results, indicating no significant differences between men and women in CSE (Torkzadeh et al., 1999).

It is believed that this disparity begins as early as childhood. A study involving 5th and 6th-grade students revealed that boys engage in computer usage more frequently in extracurricular activities (Vekiri and Chronakib, 2008), as a result, a significant difference in CSE was observed between boys and girls. In another study conducted by He and Freeman (2010), it was discovered that women tend to have lower levels of CSE due to their relatively lower frequency of computer usage and learning. In this case, the disparity in CSE is not attributed to inherent gender differences, but rather to differences in the frequency of computer usage and

learning experiences. It is indeed intriguing and peculiar that some studies have indicated that despite receiving training, women continue to exhibit lower levels of computer performance (Cassidy and Eachus, 2002). However, in other instances, it has been discovered that although men initially start with a higher skill level than women, during the course of training, women tend to develop these skills at a more accelerated rate than men (Downey and Kher, 2015).

As for the level of CSE, various authors have found to some extent contrasting results. Some studies suggest that men tend to have higher levels of general CSE, while women exhibit higher levels or at least equal levels of specific CSE (Saleem, et al., 2011). Additionally, in one research study, women demonstrated better performance in the subscale of computer file and software management, while men outperformed in other areas (Torkzadeh and Koufteros, 1994). However, a study conducted among business students over two decades revealed that men consistently displayed higher levels of CSE (Karsten and Schmidt, 2008).

**H2:** Men have a higher level than women in Computer Self-Efficacy.

### 2.4. Computer self-efficacy and control variables

What is interesting about the difference discovered in studies ten years apart is that despite the increased usage of computers in technology-related education from 1996 to 2006, there has been no significant overall increase in CSE (Karsten and Schmidt, 2008). It appears that the utilization of technology alone does not necessarily foster the development of self-confidence in using computers for daily tasks. Similar findings were observed in samples from Scotland and Romania, where despite greater computer usage in Scotland, no substantial difference in CSE levels was found when compared to Romania (Durndell, et al., 2000). Thus, the frequency of computer use does not inherently influence the development of self-efficacy in computer skills.

In a quantitative meta-analysis exploring CSE in research and their results, the authors strongly advocate for considering CSE as the primary variable of interest and attempting to explain other variables in relation to it (Karsten, et al., 2012). Therefore, in this research, the study examines the relationship between computer self-efficacy and other control variables: age, work position, salary, and education.

**H3:** There is no significant difference between level of computer self-efficacy and the age.
**H4:** There is no significant difference between level of computer self-efficacy and the work position.
**H5:** There is no significant difference between computer level of self-efficacy and the salary.
**H6:** There is no significant difference between level of computer self-efficacy and the education.

## 3. Methods

### 3.1. Procedure and participants

The participants in this research consisted of employees from Kosovo. Previous research mostly involved samples of students, followed by employees. It is commonly accepted in theory to use student samples due to the ease and cost-effectiveness of data collection (Karsten, et al., 2012). However, in order to gain a better understanding of this concept in the context of work, the research was conducted with an employee sample. The survey was distributed online, and a total of 320 people responded and completed the questionnaire. Among them, 41.6% (133) were women and 58.4% (187) were men. In terms of age, the majority fell into three categories: 55.3% were aged 25-34 years, 25.9% were aged 18-24 years, 14.1% were aged 25-44 years, and the remaining 3.4% were aged 45-54 years, with 1.3% falling in the 55-65 age range. This distribution of age and gender aligns with the demographic data of the people in Kosovo and the active workforce in the labor market.

In terms of job positions, the sample consisted of non-managerial workers (59.1%), managers (22.2%), and self-employed or entrepreneurial managers (5.3%). As for years of work experience, 44.1% had 1-5 years, 22.2% had 6-10 years, 14.4% had less than one year, 11.9% had 11-15 years, and 7.5% had 16 or more years of experience. Regarding income, the characteristics of the sample were as follows: 38.8% earned between 250-500 euros, 24.4% earned between 501-750 euros, 13.8% earned between 751-1000 euros, 8.4% earned up to 250 euros, 4.7% earned between 1001-1250 euros, 4.1% earned 2001 euros and more, 2.8% earned between 1251-1500 euros, 1.6% earned between 1501-1750 euros, and 1.6% earned between 1751-2000 euros.

In terms of the characteristics of the firms, specifically related to the industries in which the employees were engaged, the general service category represented the largest portion with 25.3%, followed by education (15.9%), telecommunications (14.1%), technology (14.1%), trade (8.8%), manufacturing (6.6%), government and public administration (5.3%), and 10% from other industries such as agriculture and forestry, non-governmental and not-for-profit, gastronomy, and construction. Regarding the size of the enterprises based on the number of employees, the participants were from the following categories:

- 28.1% from enterprises with 50-249 employees,
- 20% from enterprises with 1-5 employees,
- 15.6% from enterprises with 21-49 employees,
- 14.4% from enterprises with 250 or more employees,
- 12.8% from enterprises with 11-20 employees, and
- 9.1% from enterprises with 6-10 employees.

### 3.2. Instrument

Various instruments and questionnaires have been developed to measure Computer Self-Efficacy since the initial efforts. One notable contribution in this field was made by Murphy et al. (1989). They developed a 32-item scale divided into three parts: basic skills, advanced skills, and mainframe computer skills. This scale demonstrated high reliability and has been widely adopted with minor modifications in subsequent research (Torkzadeh & Koufteros, 1994). However, the field gained significant importance with the research conducted by Compeau and Higgins (1995). They developed a 10-item scale that still holds great significance in the field and introduced a new way to define CSE as a construct rooted in social psychology. Another significant contribution in this area was made by Marakas et al. (2007), who developed a measure that can be used to assess both general and specific CSE, building on existing measures and influencing the development of the multi-level computer self-efficacy construct.

Despite the availability of these instruments, the present research utilizes the scale developed by Howard (2014). The instrument employs a 7-point Likert scale (ranging from 1, strongly disagree, to 7, strongly agree) and consists of 12 items. The decision for this scale was made because it represents a more up-to-date measure compared to other scales that may include outdated items, even though they demonstrate high reliability and have been widely used in previous research. The instrument developed by Howard (2014) has shown good results and passed reliability tests, with a Cronbach's alpha value of 0.95, indicating high reliability similar to the instrument of Compeau and Higgins (1995). Additionally, it has demonstrated a positive correlation with general self-efficacy (r=0.38) (Howard, 2014). The reliability and validity of this questionnaire were further confirmed by Loar (2018). In the present research, the Cronbach's alpha of this instrument was 0.89, which is a preferred value indicating the reliability and internal consistency of the measure (Cronbach's alpha above 0.7 is accepted, while a value above 0.8 is preferred).

The original version of the scale was in English, and several steps were followed for its translation and adaptation into Albanian (Beaton et al., 2000). Initially, the scale was translated into Albanian by two translators. A version was created based on these translations, which was then sent to three doctoral students for feedback. A meeting was held to discuss the feedback, and a new version was developed, which then was translated back into the original language. The two versions were compared and necessary interventions were made by the authors. In the subsequent step, the most challenging questions were sent for feedback to the same individuals and two additional researchers. Based on their comments, the authors decided on the final version, which was then sent to a linguist for a final review. The entire process took two months.

## 4. Results

### 4.1. Correlation analysis

Nonparametric correlation analysis, specifically Spearman's rho, was employed to examine the relationships between the continuous variable computer self-efficacy (CSE) and the control variables. The findings are presented in Table 1. Based on the results, no significant or moderate relationship was found between these variables.

**Table 1:** Correlation of research variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. CSE | 0.000 | | | | | | |
| 2. Gender | -.069 | 0.000 | | | | | |
| 3. Age | -.143 * | -.222 ** | 0.000 | | | | |
| 4. Salary | .110 * | -.173 ** | .238 ** | 0.000 | | | |
| 5. Position | .027 | .077 | -.131 * | -.263 ** | 0.000 | | |
| 6. Education | -.016 | .052 | .350 ** | .175 ** | -.086 | 0.000 | |
| 7. Size | .012 | -.149 ** | .055 | .329 ** | -.456 ** | .064 | 0.000 |
| 8. Industry | .039 | .032 | -.008 | .021 | .062 | -.040 | .024 |

*: p < .05; **: p < .01; n = 320

### 4.2. Hypotheses testing

This research comprises a total of six hypotheses, which have been tested using the appropriate statistical tests.

Hypothesis 1 stated that workers in Kosovo have a high level of computer self-efficacy. The results of the descriptive analysis indicate that the mean computer self-efficacy score for the research sample is M=61.38, with a standard deviation of SD=11.98. The average score of 61.38, out of a maximum instrument value of 84, suggests that employees in Kosovo possess a high level of computer self-efficacy. Therefore, Hypothesis 1 is accepted.

Hypothesis 2 stated that men have a higher level of CSE compared to women. An independent t-test analysis was conducted to test this hypothesis. The results reveal that there is no significant difference between males (M=62.14, SD=11.91, N=187) and females (M=60.30, SD=12.04, N=133) in terms of computer self-efficacy, t(318)=1.36, p=.17 (2-tailed). The difference in mean scores (difference in mean=1.84, 95%CI) is very small. Hypothesis 2 is rejected.

Hypothesis 3 stated that there is no significant difference in computer self-efficacy across different age groups. ANOVA analysis was employed to test this hypothesis and explore the impact of age on

computer self-efficacy. The ANOVA results indicate that there is no significant difference between age groups, p=.11, F=1.88, N=320. Although Table 2 shows a slight difference, with younger age groups reporting slightly higher computer self-efficacy, the difference is negligible. Consequently, Hypothesis 3 is accepted.

**Table 2:** ANOVA findings on the relationship between age and CSE

| Scale | 18-24 | | 25-34 | | 35-44 | | 45-54 | | 55-66 | | df | F | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD | M | SD | M | SD | | | |
| CSE | 63.73 | 10.75 | 61.30 | 12.5 | 58.91 | 11.02 | 56.54 | 8.02 | 57.00 | 22.04 | 4 | 1.81 | 0.75 |

Hypothesis 4 stated that there is no significant difference between CSE and job position. An ANOVA analysis was conducted to investigate the impact of job positions on CSE. The results of the ANOVA indicate that there is no significant difference between the job position groups in the organizational hierarchy, p=.98, F=.05, N=320. Table 3 illustrates that the differences between the groups are negligible. Therefore, Hypothesis 4 is accepted.

**Table 3:** ANOVA findings on the relationship between job position and CSE

| Scale | Manager | | Worker | | Entrepreneur Manager | | Self-employed | | df | F | p |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD | M | SD | | | |
| CSE | 61.09 | 11.17 | 61.55 | 12.13 | 61.82 | 15.70 | 60.93 | 11.36 | 3 | .05 | 0.98 |

Hypothesis 5 stated that there is no significant difference between CSE and salary. An ANOVA analysis was conducted to test the relationship between monthly income from work and CSE. The ANOVA results reveal that there is no significant difference between the salary groups, with a p-value of .30 and an F-value of 1.18, based on a sample size of N=320. Therefore, Hypothesis 5 is accepted.

Hypothesis 6 posits that there is no significant difference between CSE and education. An ANOVA analysis was conducted to examine the impact of education level on CSE. The ANOVA results indicate that there is no significant difference between the education groups, with a p-value of .70 and an F-value of .35, based on a sample size of N=320. Although there is one noticeable difference, the overall findings suggest that Hypothesis 6 is accepted.

## 5. Discussion and conclusion

Kosovo presents an interesting context for research on technology usage and computer skills. Prior to this study, there were no previous initiatives to investigate computer self-efficacy among employees in Kosovo. Over the past few decades, Kosovo has experienced significant development, particularly in relation to technology adoption. Initially, due to political and economic factors, the adoption of computer technology was extremely limited, with only a few individuals owning computers at home or for business purposes. However, following the end of the war in 1999, there has been a rapid surge in the adoption of computer technology by businesses and citizens at large.

Today, despite being a latecomer to the region in terms of telecommunication infrastructure, Kosovo leads in terms of internet coverage throughout its territory (WBG, 2023). The high computer self-efficacy score obtained in this study, with a mean of 61.38 out of 84 for the sample of 320 participants, reflects this dynamic technological landscape. Furthermore, the findings indicate that there is no significant difference between the control variables and computer self-efficacy. Notably, contrary to previous studies such as He and Freeman (2010) and others, the present study discovered that in the case of Kosovo, there is no significant difference between men and women regarding computer self-efficacy. The difference in means was minimal and practically negligible.

These results strongly suggest that working with computers in Kosovo is embraced by employees from all categories, emphasizing that everyone possesses the self-confidence and ability to utilize computers effectively in accomplishing work tasks. These results are encouraging, particularly in light of the growing significance of artificial intelligence (AI) in shaping the future of work, suggesting that individuals may be well-positioned to navigate the AI-driven future. However, it is crucial to avoid falling into the trap of assuming that merely using a computer automatically develops the confidence and skills to fully benefit from it (Karsten, et al., 2012; Durndell, et al., 2000). This holds true even when comparing digital natives to other groups (Teo, 2015).

Another relevant contribution of this research is the translation and adaptation of the scale developed by Howard (2014) into a new cultural context, specifically the Albanian language in the country of Kosovo, which is undergoing a period of transition. The Cronbach's alpha of the research was 0.89, indicating a very good level of internal consistency and reliability. In the future, it is recommended to continue conducting research with employee samples and explore additional continuous variables that shape the modern workplace together with CSE.

## Compliance with ethical standards

### Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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