How good do you think you are with computers? The link between teachers' perceived digital literacy, occupational efficacy, and psychological distress

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Highlights

- Higher perceived digital literacy (DL) led to higher occupational self-efficacy (OSE).
- OSE led to lower levels of psychological distress (PD).
- Gender moderated the link between DL and OSE.

Abstract

The present study focused on teachers' perceived digital literacy, occupational self-efficacy, and psychological distress. Our sample included 279 Romanian teachers aged 20 to 66 ($M=31.92$, $SD=11.72$), with professional experience ranging from 1 to 46 years ($M=8.90$). We tested a moderated mediated model, exploring occupational self-efficacy as a mediator of the relationship between perceived digital literacy (moderated by gender, controlling for age and professional experience) and psychological distress. Our findings suggested that higher levels of perceived digital literacy led to higher levels of occupational self-efficacy, which led to lower levels of psychological distress. Gender moderated this relationship, i.e., the observed indirect effects were significant for both genders, but the effects were stronger for male participants. We discuss our results concerning their practical implications for teachers' mental health and professional activity and the perspectives following the COVID-19 pandemic.

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1 Introduction

The COVID-19 pandemic has created the most significant disruption of education systems in human history, affecting nearly 1.6 billion learners in more than 200 countries (d'Orville, 2020). The closures of schools affected more than 94% of the world's student population (Pokhrel & Chhetri, 2021). The pandemic challenged the educational processes, forcing teachers and students to transfer and adapt to online educational platforms, methods, rigors, and rules. As Jalongo (2021) suggested, following Jandric (2020), adapting to the reality of the COVID-19 pandemic is, in many ways, a social and educational experiment that might diminish educational opportunities in the long term.

Since its outbreak in 2019, governments have imposed various health-related measures to contain the spread of the novel coronavirus. However, emergency remote teaching ensured that the educational process continued, relying more on computer technology and reconstructing the teaching process during and following the COVID-19 pandemic (Jalongo, 2021). In Romania, the governmental efforts to reduce the spread of the virus have led to the widespread closure of schools, colleges, universities, and other educational institutions, starting in March 2020. Though there have been times during the first two pandemic years (2020 and 2021) when online teaching was replaced with face-to-face or hybrid methods, i.e., both face-to-face and online teaching (e.g., September-November 2020; April-May 2021), the high rates of COVID-19 infections and deaths led to mainly online education, instead of physical participation in the educational process, at all levels (from preschool to universities). The present research was conducted in 2022, when all schools and universities returned to face-to-face learning. However, some universities adhered to a hybrid learning system, allowing students to choose between online and offline participation while mandating university teachers to teach in a hybrid approach.

The forced transition from traditional face-to-face to exclusively online teaching (and emergency remote teaching) was challenging for all parties involved, i.e., teachers, students, and parents (Daumiller et al., 2021). Previous studies already highlighted some of the related adverse effects of this transition on students, teachers, and parents, which included anxiety (Hu, 2021), low academic performance (Panagouli et al., 2021), tiredness, sleeping problems, lack of motivation (Ali et al., 2021), poor mental health (Allen et al., 2022), PTSD and grief-related symptoms (Guessoum et al., 2020; Hu et al., 2021), and, generally, psychological distress and a decrease in well-being (Chaturvedi et al., 2021; Prime et al., 2020; Sultana et al., 2021).

Finally, a review by Jalongo (2021) highlighted, among the primary themes related to the disruption caused by the pandemic, significant modifications to teaching and reliance on technology. The present study focused on this specific dimension by exploring teachers' perceived digital literacy and its link with occupational self-efficacy and psychological distress. although digital literacy and self-efficacy might be relatable when discussing online teaching, our approach considered perceived digital literacy a different construct than domain-specific self-efficacy, as previous studies suggested (e.g., Prior et al., 2016). We will further elaborate on each construct proposed in our research model and detail the complex ways they are connected.

1.1 Teachers' digital literacy

During the COVID-19 pandemic, teachers faced several challenges related to digital education, including adopting new teaching methods and understanding how to use screens healthily and productively to thin the gap between academic staff and students (Buchholz et al., 2020). These competencies comprise digital literacy (alternatively referred to as digital competence or computer literacy), which refers to thinking skills and competencies related to understanding and using information in formats that require computers (Shopova, 2014). The definition of digital literacy is prone to change as technological progress allows the implementation of more features for computers (Nawaz & Kundi, 2010).

In the current study, we measured participants' perceived digital literacy rather than objectively measuring their digital skills. Previous research highlighted the relevance of researching perceived digital literacy for teaching optimization (Garcia-Martin & Garcia-Sanchez, 2017). Furthermore, we investigated occupational self-efficacy as a predictor of digital literacy. In this context, measuring subjective perceptions of digital literacy would be the best approach, given that self-efficacy refers to the beliefs about one's competence (Aslan, 2021).

Digital literacy was also suggested as one of the practical and efficient solutions to manage social media fatigue in the community (Sunil et al., 2022) and misinformation, particularly in educational contexts (e.g., Nygren et al., 2022). According to Alanoglu et al. (2022), because of the importance of digital literacy in today's world, in which technology permeates every part of life, teachers must be open to and embrace digital change and transition without reservations. Furthermore, considering the challenges and restrictions imposed by the COVID-19 pandemic, teachers are expected to improve their digital abilities as well as the skills of their students.

An essential aspect of studying teachers' digital literacy is acknowledging the possibility of a technological-related generational gap between teachers and students (as well as between different generations of teachers). Depending on the specifics of their work, age, familiarity with computers, and other personal and contextual factors, teachers' digital competencies vary. For example, some teachers might only have a basic level of digital competence, while others are integrating digital technology into their teaching methods or acquiring professional digital competence since they know how to use computers before beginning their careers (Starkey, 2020). Similarly, Anisimova (2020) suggested that teachers from younger generations present higher levels of digital literacy and more positive attitudes toward programs related to digital literacy. Furthermore, in a recent literature review (Li & Yu, 2022), teachers' digital literacy was positively associated with their career satisfaction and perceived professional role. Thus, we should also look into their link with teaching experience and age when discussing digital literacy.

Gender differences. Previous studies suggested divergent results concerning gender differences in digital literacy. Some studies suggested small but significant gender differences in digital literacy, with male participants scoring higher levels of digital literacy, although this effect was influenced by technology use (Rizal et al., 2021). Similarly, Sivrikaya (2020) suggested a higher level of digital literacy among male students, while Sánchez-Cruzado et al. (2021) suggested that male teachers and those

with more experience presented higher levels of digital literacy. Furthermore, Brata and their collaborators (2022) reported no significant gender differences while also suggesting an association between interest in digital technology and digital literacy. Finally, Jan (2018) indicated no significant gender differences in digital literacy. Thus, the results in this area seem to be mixed and need further research.

However, the results are primarily based on the actual, tested digital literacy among teachers; their perceived digital literacy is much less explored in recent literature. When discussing teachers' perceived digital literacy, we refer to their perceived ability to properly use digital resources in the educational environment (Li & Yu, 2022). Previous studies examining teachers' self-reported levels of digital literacy frequently found significant discrepancies with their actual proficiency levels (e.g., Ertmer & Ottenbreit-Leftwich 2010; Voogt et al., 2015). For example, while some teachers might report feeling confident about their use of technology, they might also report lacking knowledge and skills in specific digital areas, such as creating and using multimedia resources and technology to support student collaboration (Ertmer & Ottenbreit-Leftwich, 2010).

In the present study, we focused on teachers' perceived digital literacy as a possible factor linked to their psychological distress through occupational self-efficacy, as previous studies suggested when exploring similar relationships (e.g., Kahveci 2021). Furthermore, when exploring different skills and abilities, overestimating one's competence (i.e., perceived versus actual competence) might help one succeed in complex and challenging tasks and persist during setbacks (Baartman & Rujis, 2011). Furthermore, the conceptual model proposed by Prior et al. (2016) suggested that students' perceived digital literacy positively predicted their self-efficacy within online distance education activities (similar to the COVID-19 context). Their results were based on the four digital literacy characteristics proposed by Martin (2006), i.e., (1) successful digital actions in life situations, (2) life situations determine digital literacy variability, (3) digital literacy is broader than information and communications technology (ICT) literacy, and (4) digital literacy requires knowledge, skills, attitudes, and personal traits. These characteristics resemble high self-efficacy, mainly because both concepts depend on a person's ability to handle ambiguity and succeed. However, self-efficacy is more about self-belief, while perceived digital literacy is more about perceived ICT skills.

1.2 Digital literacy and occupational self-efficacy

Occupational self-efficacy has been a topic of interest since its introduction in the 1970s. According to Bandura (1981), self-efficacy can be defined as the belief in one's ability to deal with challenging activities and problems and perform a task efficiently. Occupational self-efficacy refers to one's perception of their ability to manage and fulfill charges and duties related to their job (Rigotti et al., 2008; Pethe et al., 1999) argued that occupational self-efficacy comprises six key components, i.e., confidence, command, adaptability, personal effectiveness, positive attitude, and individuality. According to previous research, occupational self-efficacy seems to be associated with job satisfaction and performance, work commitment, work satisfaction and engagement, and readiness to change within an organization (e.g., Liu &

Huang 2019; Schyns & von Collani, 2002). Job satisfaction, intrinsic job motivation, and life satisfaction are also significantly associated with occupational self-efficacy (e.g., Gayathri & Karthikeyan 2016). Pressley and Ha (2021) reported that during the COVID-19 pandemic, teachers engaged in virtual teaching had the lowest self-efficacy scores compared to teachers in hybrid systems or those teaching in person (face-to-face). However, no self-efficacy differences related to work experience were reported.

Gender differences Previous studies offer divergent results regarding gender differences in occupational self-efficacy. For example, Hartman and Barber (2019) reported no significant differences, while Ramaci et al. (2017) suggested that male participants perceived themselves as more self-efficient than their female counterparts in professions related to science and technology. Thus, further studies are needed to better assess the potential role of gender, and our study addressed this issue.

1.3 Occupational self-efficacy, age, and teaching experience

Previous studies suggested that age-related factors are significantly associated with teachers' self-efficacy, though they are subject to workplace environmental factors (Bandura, 1981). Furthermore, the different sources of self-efficacy may shift over time, with verbal persuasion and contextual factors playing a more significant role for beginner teachers than experienced staff (Tschannen-Moran & Woolfolk Hoy, 2007). The beliefs about one's ability to succeed professionally could be more stable but rather subject to a dynamic developmental process. Furthermore, this process continues throughout one's lifetime and is subject to individual characteristics and interpretation of the surrounding environment. However, only a few studies explored the relationship between years of teaching experience and teachers' self-efficacy, and the findings are mixed. For example, Topchyan and Woehler (2021) suggested that teaching experience did not significantly affect teachers' job satisfaction or work engagement. On the other hand, Ross and their collaborators (1996) and Ghaith and Yaghi (1997) found negative correlations between years of experience and teachers' general teaching self-efficacy.

According to Tschannen-Moran and Woolfolk Hoy (2007) and Wolters and Daugherty (2007), teachers' self-efficacy seems to be most malleable in the difficult early stage of a teacher's career, then increases and becomes more firmly established as teachers gain experience. However, the middle and late stages of a career present unique problems that can impact an employee's motivation and level of job satisfaction (e.g., Kooij et al., 2008). Furthermore, other studies found that the number of years of teaching might have a nonlinear link with instructional strategies, classroom management, and student engagement – i.e., facets of self-efficacy, suggesting higher levels from early career through mid-career and then significantly lower (Klassesen & Chiu, 2011). Additionally, other studies suggested that self-efficacy might be lower for early career teachers due to the "reality (or transition) shock" of their first contact with classroom teaching (Voss & Kunter, 2020).

Furthermore, in their longitudinal study, Woolfolk Hoy and Burke Spero (2005) suggested a significant increase in teachers' self-efficacy during teacher training, followed by a decline in that self-efficacy at the end of their first year of teaching; however, these results were suggested by a very small sample size of 29 teachers. Finally, Ghaith and Yaghi (1997) also suggested that more experience corrodes teachers' willingness to adopt new instructional innovations and decreases their general teaching efficacy.

1.4 Teachers' self-efficacy and psychological distress

Depression, anxiety, and stress are negative affective conditions that often overlap, comprising psychological distress (Lovibond & Lovibond, 1995a, b). The scales designed to measure the constructs separately often show moderate or high correlations (Wang et al., 2016), but it also might be helpful to mention some of their distinctive characteristics. For example, depression refers to hopelessness, dysphoria, low self-esteem, and lack of incentive. The anxiety dimension refers to the subjective and somatic symptoms of anxiety, and the stress dimension is related to nervous tension, overreacting to stressful events, and difficulty in relaxation after exposure (Wang et al., 2016).

Previous studies suggested that stress is the most widespread adverse affective condition among academic staff and teachers in their 40s or older and female teachers reported higher levels of depression, stress, and anxiety (Desouky & Allam, 2017; (Ozamiz-Etxebarria et al., 2021a, b). Depression, anxiety, and stress among teachers were previously associated with lower levels of emotional intelligence (Martínez-Monteagudo et al., 2019). In addition, Ozamiz-Etxebarria and their collaborators (2021) reported a high prevalence of depression, anxiety, and stress symptoms among teachers, with a higher level of anxiety and stress symptoms among female teachers and teachers in their late 40s or older. More specifically, Ozamiz-Etxebarria et al. (2021a, b) suggested that 17% of the participants presented high anxiety levels, 19% reported high levels of depression, and 30% reported high-stress levels.

The link between self-efficacy and psychological distress has been explored in various contexts, suggesting their significant negative association (e.g., Albanese et al., 2019). In studies focused on educational settings, previous data highlighted that teachers' self-efficacy was negatively linked to perceived burnout (Friedman, 2003) and emotional exhaustion (Klassen & Chiu, 2011) and positively associated with job satisfaction (Collie et al., 2012) and innovative behavior (Klaeijsen et al., 2018). In longitudinal studies, teachers' self-efficacy was negatively related to emotional exhaustion and depersonalization and positively associated with personal accomplishment (Fernet et al., 2012). Finally, the integrative overview of Zee et al. (2016), focusing on the link between teachers' self-efficacy and their well-being, also supported the negative, significant link between the two constructs and itheirconsistency across different cultures and different grade levels.

1.5 The present study

In the present study, we focused on teachers' psychological distress and the potential ways it might be linked to their perceived digital literacy through occupational self-efficacy. One of the novelties of the present research is the fact that, though previous studies focused on students (e.g., Qashou, 2021) or other professional categories when discussing digital literacy, our focus was on teachers, a less investigated professional category in this regard. A second novel addition to our research is shaped by the COVID-19 pandemic context, which forced boundaries, limitations, and even technological progress, in all significant areas, from personal to social and educational dimensions.

Previous studies exploring the link between digital literacy and occupational self-efficacy reported significant positive associations (Kahveci, 2021; Ko, 2020). Also, previous studies highlighted the negative associations between occupational self-efficacy and psychological distress (Helms-Lorenz & Maulana, 2016; Pisanti et al., 2015), anxiety (Durdukoca & Atalay, 2019), and stress (Prahara & Indriani, 2019). Furthermore, some findings suggested potential gender differences concerning digital literacy (Rizal et al., 2021; Sivrikaya, 2020; Sánchez-Cruzado et al., 2021). However, previous studies concerning gender differences in occupational self-efficacy seem to be mixed and need further investigation (Hartman & Barber, 2019; Pressley & Ha, 2021; Ramaci et al., 2017).

However, there seems to be limited but considerable evidence about the associations between teachers' perceived digital literacy, occupational self-efficacy, and psychological distress, especially during the COVID-19 pandemic. For example, studies have suggested a widespread prevalence of mild to moderate symptoms of distress in the context of online education during the COVID-19 pandemic (Saha et al., 2021). Ma and collaborators (2021) reported teacher burnout and adaptability as potential moderators of the relationship between lack of experience in online teaching, separation of teachers from students, unsatisfactory student academic performance, and teacher self-efficacy. Toto and Limone (2021) also reported positive associations between the impact of online teaching during the COVID-19 pandemic and teachers' stress. Furthermore, Bosanac and Luic (2021) reported that individuals with higher levels of digital literacy presented lower stress levels during the COVID-19 pandemic since they could access usefulhelpfulmation more efficiently. Thus, our study aimed to add to the empirical evidence concerning the complex links between these variables and teachers' significant and complex role within the post-COVID-19 pandemic educational grounds.

Considering these previous results, we tested a moderated mediation model which included occupational self-efficacy as a mediator between teachers' perceived digital literacy and psychological distress and gender as a moderator of the relationship while controlling for age and teaching experience. Our primary research questions (RQ-s) were the following:

RQ1. How is teachers' perceived digital literacy linked to their psychological distress?

RQ2. Does teachers' occupational have an indirect effect on perceived digital literacy and psychological distress?

RQ3. Does gender moderate the link between perceived digital literacy and occupational self-efficacy?

Our goal was to answer these questions regardless of age and teaching experience, given the pandemic context, which did not discriminate between such characteristics when shaping the online educational context. Thus, translating these research questions into research assumptions, we assumed that teachers with higher perceived digital literacy might also perceive themselves as more competent and autnomous in their work (Cherniss, 2017; Prior et al., 2016). This, in turn, might lead to lower depression, anxiety, and stress levels (i.e., psychological distress) (Ebersold et al., 2019). In other words, we assumed that teachers' perceived digital literacy would be significantly linked to their psychological distress through occupational self-efficacy and that gender would moderate the link between teachers' perceived digital literacy and occupational self-efficacy (when controlling for age and teaching experience). More specifically, we tested the following hypotheses (controlling for age and teaching experience):

H1. Teachers' perceived digital literacy would be significantly linked to their occupational self-efficacy.

H2. Occupational self-efficacy would be significantly linked to teachers' psychological distress.

H3. Occupational self-efficacy would mediate the link between teachers' perceived digital literacy and psychological distress.

H4. Gender would moderate the relationship between teachers' perceived digital literacy and occupational self-efficacy.
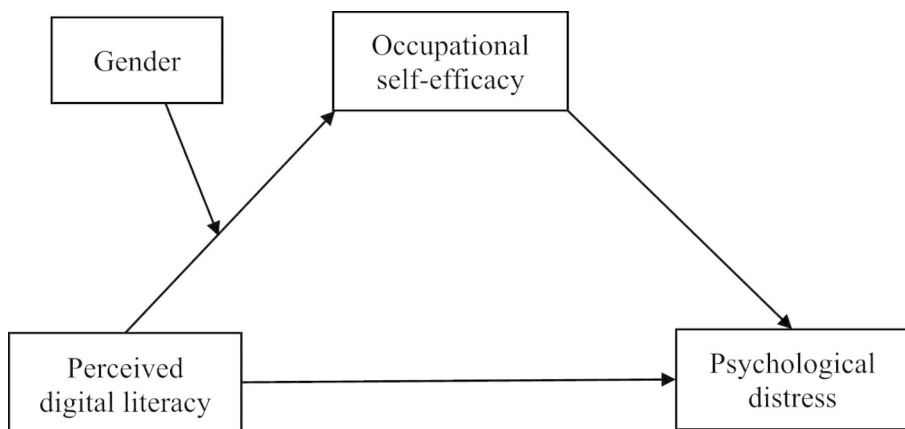
The proposed research model is presented in Fig. 1.

Fig. 1 The proposed research model

2 Method

2.1 Participants and procedure

Our sample included 279 Romanian teachers (elementary to university levels). Their ages ranged between 20 and 66 ($M = 31.92$, $SD = 11.72$, 79.6% females). Their teaching experience ranged from 1 to 46 years ($M = 8.90$, $SD = 10.23$). The research protocol was designed following the ethical requirements of the 2013 Declaration of Helsinki and the national laws from Romania regarding ethical conduct in scientific research, technological development, and innovation. All participants voluntarily participated in the study and gave written informed consent. The time needed to answer all the questions was around 15 min. Furthermore, all participants were informed that (a) there were no right and wrong answers, (b) their information was anonymous, and (c) all the data they provided would remain confidential. The survey was advertised using email invitations to 14 public schools and preschools and one university from the country's northeastern part. The participation rate was around 27%. The participants added their answers using a web-based platform in the spring of 2022.

2.2 Measures

We used the back-translation method to validate the quality of translated research instruments, and no inconsistencies were detected (Tyupa, 2011). We also pretested the instruments in a sample of 24 teachers aged 19 to 26, and no issues were reported.

Digital literacy   We used the Digital literacy scale developed by Rodríguez-de-Dios et al. (2018) to assess six different digital skills using 28 items, measured on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Example items include "I know how to bookmark a website I like so I can view it later" (*Technological skill*); "I know when I can post pictures and videos of other people online" *Personal security skill*); "I know how to compare different sources to decide if the information is true" (*Critical skill*); "I use software to detect and remove viruses." (*Devices security skill*); "I get tired when looking for information online" (*Informational skill*); "Depending on whom I want to communicate with, it is better to use one method over the other (make a call, send a WhatsApp message, send an email, etc.)" (Communication skill)." In the present study, we used the overall measure of digital literacy, calculating a total score by summing the responses for each item. Higher scores indicated better digital skills. Cronbach's alpha in the present study was $\alpha = 0.901$. Previous studies confirmed the scale's good psychometric properties (e.g., Rodríguez-de-Dios et al., 2018).

Occupational self-efficacy   We used the Short Version of the Occupational Self-Efficacy Scale, developed by Rigotti and their collaborators (2008), to measure occupational self-efficacy. The scale comprises six items (e.g., I can remain calm when facing difficulties in my job because I can rely on my abilities) measured on a 6-point Likert scale, ranging from 1 (not at all true) to 6 (completely true). In the present study, we calculated a total score by summing the responses for each item, with

higher values reflecting high occupational self-efficacy. Cronbach's alpha in the present study was α=0.897. Previous studies confirmed the scale's good psychometric properties (e.g., Peng et al., 2021).

Psychological distress We used The Depression, Anxiety, and Stress Scale −21 Items (DASS-21; Lovibond & Lovibond 1995a, b) scale to measure the emotional states of depression, anxiety, and stress, i.e., psychological distress. Participants answered the 21 items on a scale ranging from 0 (never) to 3 (almost always), following the instructions: "Please read each statement and circle a number 0, 1, 2 or 3, which indicates how much the statement applied to you over the past week". The scale measures anxiety (e.g., "I was aware of dryness of my mouth"), depression (e.g., "I couldn't seem to experience any positive feeling at all"), and stress (e.g., "I tended to overreact to situations"). In the present study, we calculated the overall score for psychological distress, as previous studies suggested its one-factor model (e.g., Jiang et al., 2020). Higher scores indicated higher psychological distress. Cronbach's alpha in the present study was α=0.96.

Demographic data We used a demographic scale to assess participants' self-reported gender, age, and teaching experience.

2.3 Overview of the statistical analysis

First, preliminary analyses were conducted to assess whether demographic variables (age, gender) relate to participants' psychological distress. Second, zero-order correlations among the study's primary variables were computed. Next, we standardized the scales using z-transformations to reduce the multicollinearity that higher-order terms might produce. Finally, we tested a moderated mediation model using Hayes' Macro Process (2013), model 7 (95% confidence interval and 5000 resampled samples).

The descriptive statistics for the primary variables (i.e., means, standard deviations, minimum and maximum scores) are detailed in Table 1.

Correlation analyses (see Table 2) suggested significant negative associations between teachers' perceived digital literacy and age (r=-.42, p<.001), experience (r=-.42, p<.001), and psychological distress (r=-.18, p=.002). We also found a positive association between perceived digital literacy and occupational self-efficacy (r=.33, p<.001). Finally, occupational self-efficacy was significantly and negatively associated with teachers' psychological distress (r=-.40, p<.001).

Table 1 Descriptive statistics for the primary variables (N=279)

Note: The reported values are before z-transformations

	M	SD	Min	Max	α
Age	31.92	11.72	20	66	-
Teaching experience	8.90	10.23	1	46	-
Psychological distress	48.24	19.87	21	98	0.96
Perceived digital literacy	111.59	14.27	48	134	0.90
Occupational self-efficacy	30.40	5.12	10	36	0.89

Table 2 *Zero-order correlations between the primary variables (N=279)*

*p<.05; **p<.01

Note: The reported values are before z-transformations

	1	2	3	4
1. Age	-			
2. Teaching experience	.92**	-		
3. Occupational self-efficacy	.06	.05	-	
4. Perceived digital literacy	-.42**	-.42**	.33**	-
5. Psychological distress	-.04	.01	-.40**	-.18*

Index for moderated mediation: .14, 95% CI [.04; .25]

Gender

Occupational self-efficacy

$b = .72**$

$b = -.36**$

Gender = male: $b = .72**$
Gender = female: $b = .34**$

Digital literacy

direct effect: $b = -.06$

Psychological distress
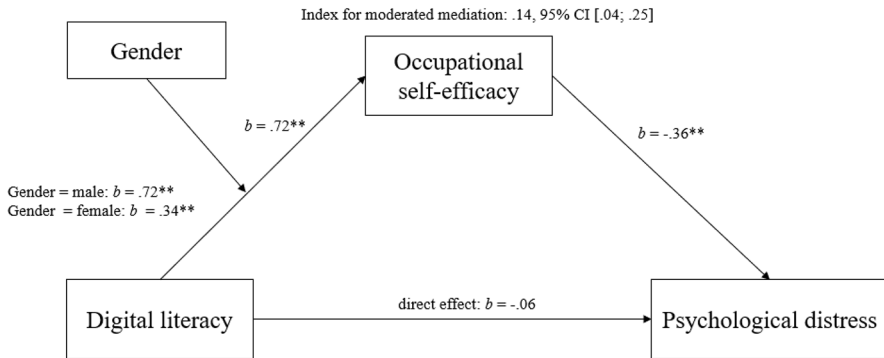
Fig. 2 The moderated mediation model (Model 7) results (controlling for age and teaching experience). *p<.05; **p<.001

2.4 Mediating and moderating effects

Based on the results from the correlation analyses, we further used the SPSS macro program PROCESS – Model 7 to investigate the potential mediating role of occupational efficacy on the relationship between teachers' perceived digital literacy and psychological distress and the possible moderating effect of gender, while controlling for age and teaching experience. We used the standardized versions of the primary variables (i.e., following z-transformations).

The direct effect of perceived digital literacy on psychological distress was not significant, $b=-0.06$, $SE=0.06$, $R^2=0.18$, $MSE=0.82$, $p=.29$, 95% CI [-0.19; 0.06]. The effect of digital literacy on occupational self-efficacy was significant, $b=0.72$, $R^2=0.20$, $MSE=0.80$, $SE=0.10$, $p<.001$, 95% CI [0.52; 0.92]. The effect of occupational self-efficacy on psychological distress was also significant, $b=-0.36$, $SE=0.05$, $p<.001$, 95% CI [-0.48; -25]. The indirect effect of digital literacy on psychological distress through occupational self-efficacy was significant for both male participants, $b=-0.26$, $SE=0.05$, 95% CI [-0.39; -0.16], as well as for female participants, $b=-0.12$, $SE=0.03$, 95% CI [-0.18; -0.07]. The difference between the conditional indirect effects (i.e., index of the moderated mediation) was significant, $b=0.14$, $SE=0.05$, 95% CI [0.04; 0.25] (see Fig. 2).

3 Discussion

The present study focused on teachers' perceived digital skills, occupational self-efficacy, and psychological distress. Our results suggested that occupational self-efficacy seemed to mediate the relationship between perceived digital literacy and psychological distress. Higher levels of perceived digital literacy led to higher levels of occupational self-efficacy, which led to lower psychological distress. The observed indirect effects were significant for both genders, but the effects were stronger for male participants. In all cases, being male had a stronger negative impact on the relation between teachers' perceived digital literacy and psychological distress through the mediating occupational self-efficacy. In this regard, previous studies offered divergent results regarding gender differences in levels of digital literacy. Some studies suggested that male participants might have higher levels of digital literacy, while others did not find any significant gender differences. Brata and their collaborators (2022) suggested that interest in digital technology might be a more appropriate predictor of digital literacy, suggesting that male participants might present higher levels of digital literacy in some studies due to their higher interest in using computers. However, the current study did not measure the participants' interest in using computers or other potential confounding variables that might help us understand gender differences in digital literacy and also focused on perceived (and not per se) digital literacy, shaping a novel theoretical approach and new empirical insights.

Our results align with the framework proposed by Prior et al. (2016), who suggested that perceived digital literacy positively predicts self-efficacy in online educational settings. However, their results were based on students' self-reports, while our approach focused on teachers. Though future studies are needed in this regard, this pattern is interesting through its similarities between both groups, i.e., students and teachers. Also our results also confirm previous findings regarding the significant positive link between teachers' self-efficacy and their well-being (Zee et al., 2016). However, it is important to note that the reduction in distress among teachers with higher perceived digital literacy might not be entirely related to the tasks at their workplace. Previous studies (Bosanac & Luic, 2021) suggested that individuals with higher levels of self-reported digital literacy might experience less psychological distress since they have access to more information about ongoing events and can find more solutions efficiently. It is important to note that, even outside the context of the COVID-19 pandemic, the presence of computers in education is constantly increasing; therefore, digital literacy is becoming an increasingly important resource.

Several general limitations need to be accounted for when discussing the present results. First, all measures were self-reported, thus enhancing the possibility of desirable answers. Future studies might benefit from using alternative measurements, such as experimental approaches, from lowering this potential risk. Next, we used a convenience sample, thus, reducing the generalizability of the present findings (Crossman, 2018). Future studies might benefit from using more extensive and heterogeneous samples. Also, our cross-sectional approach does not allow us to draw causal relationships. Future studies could explore this relationship using longitudinal data. Also, we did not differentiate between teachers' educational levels in the analyses, so we did not report whether these findings apply to all groups or if there were

any organizational differences. Though the sample size of the present research did not allow us to explore this matter, future studies might benefit from exploring this issue.

Additionally, we did not account for a series of variables that might have caused significant variances in our results due to their potential connection with teachers' digital skills, such as the schools' location (rural versus urban schools), the teacher's subject field, or professional status (Hatos et al., 2022). Finally, we measured teachers' professional experience as a linear variable, not a categorical one, as most previous studies did (e.g., Wolters & Daugherty 2007). Thus, our results might reflect a more generalized view of the role of this covariate variable in our analyses and not specific patterns for different educational levels (and this might well be considered both an addition to our study and a limitation, depending on the general research perspective).

It is also important to mention that our sample differs in cultural and social practices concerning teaching and teachers' social status. We already know from earlier explorations that social and organizational cultural factors play a significant role when discussing teaching career perception, attitudes about teachers, and collective self-efficacy beliefs (e.g., Bray-Clark & Bates 2003; Caprara et al., 2003); thus, present findings might reflect a social perspective on teaching efficacy. For example, in the Romanian education system, the occupation of a tenured teaching position and the passing of related specific exams was equivalent to many years of achieving unperturbed professional stability. Also, continuing education through refresher courses of professional knowledge, skills, and competencies is a personal choice of each professional.

Nevertheless, our findings align with the theoretical approaches we based our research model on, suggesting a lower cultural variability and a potentially higher homogeneity of the observed relationships. Finally, our study captured the immediate effects of the COVID-19 pandemic adding to the literature regarding the link between the examined variables, and the potential challenges imposed by the significant educational practices and work climate changes (Eckley et al., 2022; Rabaglietti et al., 2021). However, future studies should investigate whether similar relational patterns can be found during less turbulent times.

4 Conclusion

The current results might help us better understand the role of perceived digital literacy in their occupational self-efficacy and well-being. While computers are gradually becoming more and more relevant in education, the COVID-19 pandemic imposed a sudden shift from traditional teaching to online teaching and evaluation in many areas across the globe, hastening this transition process to newer technologies in education and offering teachers a limited amount of time to learn how to use those technologies. Therefore, teachers who endorse digital technologies and learn how to use them might perceive themselves as more digitally competent, which might, in turn, lead to the belief that they might be more capable of carrying out their duties since digital education is becoming increasingly important in the current teaching environment. Also, having a higher level of occupational self-efficacy might help

teachers lower their psychological distress, contributing to more positive educational outcomes for their students and higher professional achievements for themselves (Zee & Koomwn, 2016). Therefore, educational policymakers should consider the importance of integrating digital education into the training of the academic staff to increase their actual and perceived digital literacy, which might further boost their occupational self-efficacy and experience less psychological distress.

Declarations

Ethics approval and consent to participate Before beginning the study, this study's protocol was designed in concordance with ethical requirements specific to the Faculty of Psychology and Educational Sciences, "Alexandru Ioan Cuza" University (Iasi, Romania). All participants voluntarily participated in the study and gave written informed consent following the Declaration of Helsinki and the national laws of Romania regarding ethical conduct in scientific research, technological development, and innovation.

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