Italian teachers' emotional styles and burnout when using educational technology

Giuseppe Ritella, Pietro Crescenzo**, Sefa Bulut***, Nadia Sansone****, Susanna Annese*****, Maria Beatrice Ligorio******

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Abstract

The main aim of this study is to analyze the relationship between the use of Educational Technology (ET), the development of Burnout Syndrome (BOS), the teachers' Emotional Styles (ES), and their biographies. A non-probabilistic convenience sample of 379 teachers completed an online survey on the three dimensions above mentioned. Descriptive statistics together with the Mann-Whitney U test, the Kruskal-Wallis test, and linear regression models were used to analyze the data. The results revealed that 2.6% teachers are at risk for BOS while use of ET had no impact on BOS. Certain biographical dimensions and ESs predicted teachers' ET use. Based on the analysis, the authors conclude that studying how emotional and personal aspects influence the relationship between teachers and technologies can be useful to prepare teachers for innovating their practice.

Keywords: Burnout, Educational Technology, Teachers Emotional Style

* University of Campania Luigi Vanvitelli, Italy, 0000-0002-0845-1266. First co-authorship, equally contributed.

** University of Bari Aldo Moro, Italy, 0000-0001-5240-315X. First co-authorship, equally contributed.

*** Ibn Haldun University, Türkiye, 0000-0002-2622-4390.

**** University Unitelma Sapienza of Rome, Italy, 0000-0002-3413-7983.

***** University of Bari Aldo Moro, Italy. Susanna Annese, 0000-0003-3296-9118; Maria Beatrice Ligorio, 0000-0003-3028-5046.

Corresponding author: giuseppe.ritella@unicampania.it

Authors Contributions

G. R. and P. C. conceived and designed the study under the supervision of M. B. L.; G. R., P. C., and M. B. L. collected the data; G. R. developed the theoretical framework with the aid of P. C. and M. B. L.; P. C. performed the statistical analysis in collaboration with G. R., M. B. L, and S. B.; the first draft was written by G. R. and P. C. under the supervision of M. B. L.; S. B., N. S., and S. A. reviewed and edited the draft while S.B. did the proofreading.

All authors contributed to the interpretation of the data and the synthesis of the results. The final manuscript was approved by all the authors.

Introduction

Technology has always played a fundamental role in improving the intellectual and creative achievements of human beings, as well as their quality of life. A central aspect of human evolution and civilization has been the harnessing of the human visual system to enhance cognitive achievements using external (technological) artifacts (Donald, 1991). Indeed, the emergence of literacy transformed human cognitive architecture, allowing radical externalization and collectivization of cognition through different types of writing materials such as clay tablets, papyrus, and paper (Ritella & Hakkarainen, 2012). More recently, the spreading of digital technology has triggered several transformations across professional and social life (Ritella et al., 2020; Ritella & Ligorio, 2023). In particular, the Covid-19 pandemic accelerated the digitization of teaching by forcing education systems to adopt distance teaching (Annese et al., 2022; Beraldo et al., 2021; Ritella & Sansone, 2020a).

In Italy, specifically, this was a significant transformation for the majority of Italian university students, who had not experienced remote or hybrid learning practices before the pandemic (Cacciamani et al., 2022). Furthermore, even when online teaching was adopted, many teachers used digital technology merely to relocate part of their

teaching online, attempting to reproduce face-to-face practices in the virtual environment (Sansone et al., 2019). In contrast, adopting technology to enhance educationally relevant social interaction is still perceived as a more complex and difficult endeavor (Annese & Traetta, 2018; Ritella & Sansone, 2020b). Hence, the digital transformation of teaching can produce anxiety for many teachers, with some extreme cases affecting their health (Mhlanga, 2022). In addition, the pressure to acquire technological skills can produce conflicting situations and undermine interpersonal relationships within the school context (Lisenbee, 2016; Venter, 2017).

Although previous research has focused mostly on how teachers' stress-related syndromes are associated with dysfunctional coping strategies or personality traits (e.g. Andrisano-Ruggieri, et al., 2018), the integration of technology may be an additional source of stress for teachers that should be addressed in empirical research (Giorgi et al., 2022; Kwakman, 2003). Hence, teachers forced to use educational technology can experience increased anxiety or stress (Fernández-Batanero, et al., 2021). While stress is not inherently pathological, a dysfunctional response to constant exposure can cause problems, both for workers' health and their professional context (Chirico et al., 2022). Regarding the helping professions specifically, one of the most important stress syndromes is Burnout Syndrome (BOS). The International Classification of Diseases (ICD-11) defines BOS as an occupational syndrome resulting from chronic mismanaged of occupational stress characterized by feelings of energy exhaustion or emotional exhaustion as well as occupational negativism (cynicism) and reduced professional effectiveness. BOS is considered the result of a maladaptive reaction to prolonged exposure to occupational stress in people-oriented professions.

While teachers are expected to possess high technological skills, the emotional dimension of teaching tends to be underestimated (Chirico et al., 2022). How an individual adapts and responds to emotions has been conceptualized in terms of the following six dimensions composing the emotional styles (ES) (Davidson, 2000; Kesebir et al., 2019):

- *Outlook (O)*: The ability to sustain positive emotions over time;
- *Resilience (R)*: The ability to recover from negative emotions or events;

- *Social Intuition (SI)*: The degree of attunement to non-verbal signals, such as body language, facial expressions, or vocal intonation;
- *Self-awareness (SA)*: The ability to perceive internal body signals that reflect emotions;
- *Sensitivity to Context (SC)*: The degree to which emotional and behavioral responses take into account the social context;
- *Attention (A)*: The ability to eliminate distractions and stay focused.

The discussion above indicates that teachers' emotional reactions and stress responses concerning the use of technology are crucial, both for teachers' well-being and effective innovation in teaching. Yet, these factors have not yet been comprehensively examined in the literature. While some studies have addressed issues related to BOS or teachers' emotional styles, to the best of our knowledge, the relationship between these two constructs has not been comprehensively addressed. In addition, we argue that teachers' biographies and personal characteristics should also be investigated for their potential role in the psychological processes associated to teachers' BOS. For example, the role played by gender and working position remains unclear (Andrisano-Ruggieri et al., 2018; Chirico et al., 2022; Mameli & Molinari, 2017). Accordingly, the main purpose of this study is to analyze the impact of using educational technology on the development of BOS and the role of teachers' ES in this relationship. In doing so, we will also consider teachers' gender, work position, and the educational level that they teach at.

Therefore, the study will address the following three research questions:

1) What role do biographical factors play in teachers' developing BOS, specifically age, length of service (LOS), gender (female versus male), professional position (special needs teachers versus curricular teachers), length of work contract (temporary versus permanent), and school level of teaching (from early childhood to high school)?
2) Is there a relationship between the purpose of educational technology usage (dissemination of teaching materials vs support of social interaction) and the other variables included in the study?
3) Which variables predict the use of educational technology?

Methods

Participants

Using non-probabilistic convenience sampling, 379 school teachers were recruited through an online survey. Regarding gender, 315 were female (83%), 59 were male (16%), one non-binary (0.3%) and four preferred not to answer (1.1%). The average age was 47.01 (SD 9.78; range 25-64 years) while the average LOS was about 13 years (SD 11.32; range 1-41 years). Regarding level of teaching, 201 (53%) worked in high schools, 104 (27.4%) in primary schools, 49 (12.9%) in middle schools, and 25 (6.6%) as early childhood teachers. Most participants (217; 57.3%) were permanent employees. Regarding professional position, 243 (64.1%) were subject teachers while 136 (35.9%) were special needs teachers.

Measures

A self-administered questionnaire was developed to include the following three instruments as well as questions to gather the participants' biographical information:

- The *Maslach Burnout Inventory–Educator Survey* (MBI) (Sirigatti & Stefanile, 1993). This instrument consists of 22 self-report items for participants to evaluate how often a given event occurs in their life, using a seven-point Likert-type scale (0 "Never" to 6 "Every day"). The instrument considers BOS in terms of three dimensions: Emotional Exhaustion (EE, $\alpha = .088$), Depersonalization (DP, $\alpha = .070$), and Personal Accomplishment (PA, $\alpha = .083$) (Maslach & Jackson, 1981; Sirigatti & Stefanile, 1993). Validation of the Italian version of the MBI established the following ranges: High EE ≥ 24, DP ≥ 4, PA ≥ 40; average EE = 14–23, DP = 2-3, PA = 34–39; and low EE ≤ 13, DP ≤ 1, PA ≤ 33. High scores for EE and/or DP, and/or low scores for PA, indicate high risk of BOS (Chirico et al., 2022).
- The Italian version of the *Emotional Style Questionnaire* (ESQ) (Malandrone et al., 2022) consists of 24 self-report items for par-

ticipants to evaluate the six ES dimensions: Outlook (α = .87), Resilience (α = .92), Social Intuition (α = .84), Self-awareness (α = .81), Sensitivity to Context (α = .82), Attention (α = .84). The scale provides an overall score for healthy emotionality. Participants responded using a seven-point Likert-type scale ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). A Cronbach's alpha of .93 for the overall scale was reported.

- *Ad hoc* scale to evaluate teachers' use of technology to support educational activities. This scale had two items to measure how much teachers used educational technologies for two different purposes: 1) *to support social interaction in teaching practices*; 2) *to support the delivery of educational materials in teaching*. Participants responded using a five-point Likert-type scale ranging from 0 ("For nothing") to 4 ("Always").

Procedure

To reach potential participants, several schools at all educational levels throughout Italy were contacted via email. Depending on their availability, face-to-face meetings were scheduled to present the research. Once the research aims had been fully understood by the participants and the conditions for participation made clear, a QR code was provided to teachers to complete the questionnaire online.

Data Analysis

Descriptive statistics were calculated to measure the BOS dimensions. Categorical variables were represented using frequencies and percentages. Continuous variables were represented using means and standard deviations. Continuous variables that did not meet normality assumptions were represented using median and interquartile ranges. Effect sizes were estimated by Rank-Biserial correlation. For the dichotomous variables, the Mann-Whitney U test was used to estimate group differences, while the Kruskal-Wallis test for categorical varia-

bles was used in case of more than two groups. The predictors were evaluated using linear regression models that included all variables. All analyses were performed using SPSS Version 21.0. (IBM Corporation, 2012).

Results

In this section, we first report general BOS risk in the sample and present the correlations between all the variables included in the research design. Finally, we present the results regarding the three research questions.

BOS Level

Of the participating teachers, 2.6% reported a high risk of BOS across all three dimensions (EE, DP, and PA).

Table 1 shows the correlations between the variables.

Table 1.
Correlations analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Age													
2 LOS	.683**												
3 STCM	-.134**	-.060											
4 STIS	-.132**	-.037	.638**										
5 EE	-.002	.074	-.121*	-.065									
6 DP	.015	-.030	-.040	-.003	.422**								
7 PA	.128*	.137**	.021	-.010	-.387**	-.353**							
8 O	-.062	-.045	.215**	.145**	-.528**	-.411**	.543**						
9 R	.026	-.016	.057	.001	-.470**	-.322**	.446**	.575**					
10 SI	-.092	-.031	.108*	.052	-.259**	-.387**	.453**	.480**	.323**				
11 SA	-.040	.033	.124*	.103*	-.326**	-.246**	.330**	.398**	.310**	.432**			
12 SC	-.197**	-.128*	.191**	.168**	-.190**	-.222**	.197**	.310**	.227**	.291**	.416**		
13 A	-.015	-.005	.149**	.125*	-.245**	-.203**	.324**	.319**	.354**	.281**	.260**	.260**	

Looking at Table 1, it is clear that age was negatively correlated with use of technology for both circulation of educational materials (*Rho* = -.134; *p* = .009) and social interaction (*Rho* = -.134; *p* = .010), but positively correlated with PA (*Rho* = .128; *p* = .013). There was no significant correlation between LOS and use of educational technology. The use of technology for circulation of educational materials was negatively correlated with BOS (*Rho* = -.121; *p* = .019). Regarding ES dimensions, Outlook was positively correlated with use of educational technology for both educational materials circulation (*Rho* = .215; *p* = .000) and social interaction (*Rho* = .145; *p* = .005). Social intuition was positively correlated with technology only for circulation of materials (*Rho* = .108; *p* = .036). Self-awareness was positively correlated with use of technology for both circulation of materials (Rho = .124; *p* = .015) and social interaction (*Rho* = .103; *p* = .045). Similarly, Sensitivity to context was positively correlated with use of technology for both circulation of materials (*Rho* = .191; *p* = .000) and social interaction (*Rho* = .168; *p* = .001). Attention was positively correlated to use of technology for both circulation of materials (*Rho* = .149; *p* = .004) and social interaction (*Rho* = .125; *p* = .015).

We discuss now the three research questions (RQ) guiding our work.

RQ1: What role do biographical factors play in teachers' developing BOS, specifically age, length of service (LOS), gender (female versus male), professional position (special needs teachers versus curricular teachers), length of work contract (temporary versus permanent), and school level of teaching (from early childhood to high school)?

Regarding gender differences, female teachers reported lower levels of SI (-64245, *p* = .000). Regarding BOS, primary school teachers perceived themselves as more accomplished (PA) than middle school teachers (72461, *p* = .001) and high school teachers (746111, *p* = .000). Teachers with permanent contracts tended to be more emotionally exhausted than the those on temporary contracts (*p* = .003). Subject teachers reported higher levels of PA (*p* = .038) than special needs teachers. To evaluate the role of age and LOS in BOS, linear regression was performed on the three BOS dimensions. The analysis indicated that neither age nor LOS had a significant effect on BOS (*p* > .05).

RQ2: Is there a relationship between the purpose of educational technology usage (dissemination of teaching materials vs support of social interaction) and the biographical aspects included in the study?

The most significant differences in using technology were found between school levels. Early childhood teachers reported significantly lower use of technology for circulating educational materials than both middle school (-74578, $p = .018$) and high school teachers (-68655, $p = .010$). Early childhood teachers also reported significantly lower use of technology for interaction between students than both middle school (-71078, $p = .033$) and high school teachers (-63292, $p = .025$). Regarding the use of technology for both social interaction and circulation of materials, age was a significant negative predictor (respectively, $\beta = -.148$, $p = .039$; $\beta = -.161$, $p = .024$) (Table 2).

Table 2.
Linear regressions ES and STCM and STIS

	STCM					STIS				
	Not standardized Coefficients		Standardized Coefficients			Not standardized Coefficients		Standardized Coefficients		
Model	B	SD	Beta	t	p	B	SD	Beta	t	P
(Costant)	1.922	0.559		3.439	0.001	1.887	0.64		2.951	0.003
O	0.222	0.066	0.227	3.368	.001*	0.21	0.075	0.189	2.781	.006*
R	-0.091	0.051	-0.112	-1.796	0.073	-0.13	0.058	-0.141	-2.235	.026*
SI	-0.019	0.073	-0.015	-0.263	0.793	-0.074	0.084	-0.052	-0.882	0.378
SA	-0.002	0.052	-0.002	-0.031	0.975	0.018	0.059	0.018	0.307	0.759
SC	0.098	0.055	0.102	1.762	0.079	0.136	0.063	0.125	2.142	.033*
A	0.085	0.078	0.059	1.097	0.273	0.072	0.089	0.044	0.809	0.419

RQ3: Is there a relationship between the purpose of educational technology usage (dissemination of teaching materials vs support of social interaction), BOS and ES?

In this study, we analyzed both the impact of the different use of technology on BOS and if ES dimensions can predict the purpose of technology use. Linear regression was performed on the three BOS

dimensions. The analysis indicated that the use of technology had no significant influence on BOS ($p > .05$).

Regarding the use of technology for disseminating educational materials, age was a significant negative predictor ($\beta = -.161$, $p = .024$) whereas the ES dimension Outlook was a positive predictor ($\beta = .227$, $p = .001$)

Regarding emotional style, Resilience was a significant negative predictor of using technology for social interaction ($\beta = -.141$, $p = .026$). Conversely, both O ($\beta = .189$, $p = .006$) and SC ($\beta = .125$, $p = .033$) were significant positive predictors of the use of technology for social interaction (Table 2).

Discussion

In this study, we examined the interconnections between teachers' use of educational technology, BOS, and emotional styles in an Italian sample. This research topic is particularly relevant given the current intense pressure to use technology in schools. Regarding the first research question, the results showed that only 2.6% of the participants were at high risk of BOS, which partially contradicts previous studies (Gabola et al., 2021; Mancini et al., 2022). We also found that use of technology did not make the participants more likely to report higher risk of BOS. This may be because the participants had already experienced the greatest technostress during the pandemic due to unfamiliarity with the technology and health concerns (Giorgi et al., 2022; Teymori & Fardin, 2020; Zalat et al., 2021). In fact, our data were collected when this emergency period was over.

We also found that neither age nor LOS significantly predicted BOS, whereas previous studies have reported inconsistent findings, particularly regarding the impact of age (Anastasiou & Belios, 2020; Oliveira et al., 2021).

On the other hand, we found that age significantly predicted the use of technology. That is, younger teachers reported a greater propensity to use it, indicating a generational gap in exploiting the opportunities offered by mediated teaching.

We also found that the ES dimensions impacted the use of technology. More specifically, the teachers that reported sustaining positive emotions over time tended to also report using technology more often for both circulating teaching material and social interaction. That is, the capacity to sustain positive emotions is associated with a more intensive use technology. We can interpret our finding based on previous literature examining the relationship between teachers' attitudes and use of technology. For example, according to Moreira-Fontán and colleagues (2019), teachers feel more efficient when using technology properly, which in turn leads them to maintain a positive attitude toward technology while increasing their sense of self-efficacy. The ability to sustain positive emotion over time might be a characteristic of teachers linked to the attitudes toward technology examined by these authors.

We found no gender differences in the use of educational technology. Likewise, gender did not influence the level of reported BOS risk. Although this may reflect the low number of men in the sample, our sample accurately represents the gender balance nationally among teachers whereby 83.1% of Italian teachers are women (Ministero dell'Istruzione, dell'Università e della Ricerca, 2022).

Regarding BOS scores across levels of instruction, the only difference was for personal accomplishment. More specifically, primary school teachers were more satisfied than their colleagues in other grades. This may be because primary school teaching is more closely linked to the social dimension, with less emphasis on formal assessment (Blair, 2016).

Surprisingly, in contradiction with the literature (Melanda et al., 2021), we found that teachers with permanent contracts had higher EE scores than teachers on temporary contracts. Given that neither age nor LOS had a significant effect, the type of employment contract seems to be crucial to the risk of BOS. That is, teachers with precarious contracts probably develop a sense of job mobility supporting the perception that changes are possible. This may contribute to developing sensitivity to the context, which in turn may lead to a protective role of EE (Klusmann et al., 2008). Finally, we found no differences regarding the two ways of using technology: Both permanent and temporary teachers equally used it for dissemination and for socialization.

When comparing special education needs teachers with curricular teachers, the former were less satisfied (PA) than the latter. Evans (1997) suggests that special education needs teachers start their careers with the expectation of adequately taking care of their students. However, they feel unable to contribute to their development. Furthermore, they may also feel that they lack proper training, perceive the school environment as not always inclusive, and may disagree with the school's values (Andrews et al., 2002; Romano, 2020). Other factors negatively affecting these teachers include poor prospects for career development, lack of appreciation, and feelings of helplessness (Anastasiou & Belios, 2020).

Regarding the effects of emotional style, our results also show that sensitivity to context facilitates the use of educational technology for social interaction, which is also associated with a greater propensity to appreciate the digital dimension of school contexts. Finally, the sampled teachers reported high resilience, which is associated to a low use of technology. Most likely, from the perspective of these teachers, intensive use of technology is connected with the Covid-19 pandemic emergency and positive emotions are restored in the post-pandemic situation, also by overcoming the imposed use of technology, that is, by restoring the teaching practices typical of pre-pandemic life.

Conclusions

Based on our research, we can conclude that teachers' use of educational technologies may be more complex than it may appear at first glance. It is not just a matter of technical or pedagogical skills; rather, emotional factors are also heavily involved. This conclusion has several theoretical implications, particularly the need for a more comprehensive theory that can take into account the teacher's emotional style and contextual factors. Enhancing our understanding of teachers' emotional style can provide information on how to help them become better prepared for educational innovations. In addition, certain emotional styles may also protect against the risk of burnout associated with the stress and anxiety accompanying the adoption of digital technology.

Teachers are expected to have high technological ability while the emotional energy needed to implement digital teaching is often underestimated. This might affect the definition of teachers' professional identity, which in turn has practical implications for teaching practices and teacher training. For instance, technology training programs often rightly focus on technical and pedagogical aspects. However, our study indicates that emotional and contextual aspects can also influence the relationship that teachers develop with technologies. Therefore, addressing these issues within training programs might make the use of technology more attractive.

There are several limitations to the present study. First, the sample could have been larger and more balanced in terms of gender. Second, we could have investigated the ways in which technologies are used in greater depth by including more than just two modalities. Nevertheless, our findings contribute to better understanding the relationship between teachers and technologies in several ways. To investigate this relationship further, we intend to collect qualitative data through interviews, focus groups, and observations. This can provide a deeper understanding of the antecedents and effects of introducing technology in teaching.

Ethical aspects

A letter of informed consent was included in the Google Form for distributing the questionnaire. By completing the questionnaire, the participants confirmed their consent. Confidentiality and privacy were ensured through secure data transfer and storage while the study followed the guidelines from the Declaration of Helsinki. The study was supported by a research grant on "Emotions and Learning" from the University of Bari, Italy.

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