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From the theory of Pedagogical Problematicism to contemporary teaching applications: The case of real learning experiences in teacher training

Giusi Antonia Toto
Università di Foggia

Pierpaolo Limone
Università di Foggia

Abstract

The professional vision of today's educator must be strongly anchored in accredited pedagogical models. Dewey's activism has already proposed a model of education adhering to contextual reality while mediated using technology; this model is embodied in the didactic practice of the workshop, as a natural evolution of pragmatism. The purpose of this contribution is to associate the reflection on the professionalism of the educator with these two theoretical models, both fundamental in the panorama of pedagogical studies, and provide evidence-based operational teaching proposals. In particular, a survey was carried out with school teachers of all levels in order to assess the impact of online teaching on the stress and motivation of teachers. The methodology used was correlational research, and the survey was conducted through the administration of three different scales (Online teaching learning, Perceived stress scale, The teacher motivation scale) to a total sample of 1400 teachers.

La visione professionale dell'educatore odierno ha bisogno di un forte ancoraggio a modelli pedagogici accreditati. L'attivismo di Dewey ha già proposto un metodo di educazione basato sulla conoscenza della realtà contestuale attraverso la mediazione della tecnologia; questo modello si concretizza nella pratica didattica del laboratorio come naturale evoluzione del pragmatismo. Lo scopo di questo contributo è di associare questi due modelli

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teorici fondamentali nel panorama degli studi pedagogici alla riflessione sulla professionalità dell'educatore e di fornire proposte didattiche operative supportate da evidenze. In particolare, è stata effettuata un'indagine con insegnanti di scuola di ogni ordine e grado, al fine di valutare l'impatto che la didattica online ha sullo stress e sulla motivazione degli insegnanti. La metodologia utilizzata è stata una ricerca di tipo correlazionale e l'indagine è stata condotta attraverso la somministrazione di tre diverse scale (*Online teaching learning, Perceived stress scale, The teacher motivation scale*) ad un campione totale di 1400 docenti.

Keywords: pedagogical model; professional vision; problematicism; didactics; teachers

Parole chiave: modello pedagogico; visione professionale; problematicismo; didattica; insegnanti

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1. Introduction and topic

The advent of new online teaching models (mixed, hybrid or integrated) after extensive experimentation requires a fundamental pedagogical and critical reflection, reread through the lenses of Pedagogical Problematicism, balancing theoretical reflection (which must decipher and understand the educational action) with existential planning (questioning individual and social values). The first experiments (starting in March 2020) appear to have been more improvised than grounded in scientifically-based teaching methodologies. However, the extended pandemic has forced a rethinking of the theoretical paradigms on which traditional teaching methods were based. Dewey's pedagogical model is based on the principle of learning by doing. According to the pedagogist, students are active participants in their own learning. In this context, it can be said that interest drives everything: there can be no learning if the learner is not truly interested, and interest is strongly linked to activity (Toto & Limone, 2020). Today, several innovative teaching methodologies and tools employ the learning-by-doing approach. These include:

- serious games and gamification techniques, which embody the concept of learning-by-doing;
- social learning, where students are free to learn from each other while performing a task or carrying out research using forums and social networks integrated into e-learning platforms and
- project work on learning management system (LMS) platforms.

In particular, the new teaching methodologies are adaptable to different learning contexts. The new online teaching models are, in fact, supported by innovative tools and built on evidence-based criteria. In order to implement their design and use, it is interesting to know and investigate the impact of online teaching and learning on teachers' stress and motivation.

2. Theoretical framework

The fundamental question at the root of the contemporary debate around Problematicism is the educator's search for solutions to pedagogical emergencies. This pedagogical current emphasises that there is no single pedagogical model or universally valid solution; rather, didactic intervention must be contextual (immanent) and possible (offering more than one solution to the same problem). The dialectic of the epistemological dimension of education, therefore, cannot be abstract, but must be historically determined. The didactic intervention model has a normative-constructive qualification; that is, it represents a guideline for the realization of the educational intent. The educational model to be adopted, therefore, assumes the dual role of both offering critical and descriptive analyses of the contexts in which it operates, and resolving the action of the educational dynamic in progress. The classical educational models proposed by Bertin develop on two levels: action (that is, individualistically centred on the person) and collectivist (whose intervention is centred on the whole group) (Bertin, 1982). The objective of this current is to translate the inspiring idea of Pedagogical Problematicism into concrete practice. The theoretical model proposed first analyses the possible pedagogical solutions, and then comes to a pragmatic moment in which the educator acts according to this model, and then reflects (again in theoretical

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form). In other words, unlike Dewey's pragmatism (in which the problem is faced on a purely empirical-scientific level by formulating the hypothesis and verifying it), Problematicism abstracts the problem from the real moment, framing it in antinomies and generalising it, proposing not a solution but rather a series of educational models. Both components, loyalty to reason (analysis of the antinomian possibilities with respect to the data analysed) and adherence to reality must come into play when the educator selects the appropriate/possible teaching methodology to face the existing situation.

Pedagogical Problematicism is an interpretative and operational model of educational processes, devoid of any apodictic and normative clipping and which, therefore, rejects any form of dogmatism (Baldacci & Minerva, 2015). According to Baldacci and Minerva (2015), it is a model that tends to reflect on the educational experience by analysing the following different approaches:

- Transcendental approach: this aims to restore and enhance each of the polarities that make up the constitutive antinomies of the educational experience (self-world, nature-culture), ensuring the character of universality in the educational experience.
- Dialectical approach: this aims to reject both the prior normative assumptions and the absolute syntheses a posteriori, ensuring the character of the process in the educational experience.
- Phenomenological approach: this aims to identify and enhance the multiple dimensions (cognitive, affective, ethical and social) of the educational experience, ensuring the character of complexity in the educational experience.

The most organic and complete formulation of the theory of Pedagogical Problematicism is represented by Giovanni Maria Bertin (Trebisacce, 2012). Bertin, a student of Banfi, extended the phenomenological analysis to concepts characterised by more concrete educational content, defining their theoretical and pragmatic significance as well as their inherent problematic nature (Baldacci, 2010). Taking the writings of Banfi as a reference point, Bertin draws a purely methodological distinction between the Philosophy of Education and Pedagogy. Trebisacce (2012) states that, as per this distinction, the theoretical task of understanding essentially belongs to the Philosophy of Education, while Pedagogy touches on the pragmatic dimension of educational choice. In this context, Trebisacce (2012, p. 93-101) elaborates that «the philosophy of education grasps the educational problem on a universal level, defining the possibilities of principle at an a priori level with respect to the empirical contingencies from which the historically determined educational experience is characterized, while pedagogy is placed within the horizon of the latter and aims to give a solution to the problems affecting this experience, deciding which aims must be pursued and through which methodological options».

So this research aims to explore the online teaching experience from the perspective of teachers. Specifically, the research merges the impact of online learning with the teaching experience through the study of two constructs: stress and motivation across three different standardised scales.

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3. Relevant literature

Problematicism, in the words of its main theorist Bertin (1951), is presented not as a choice but as a criterion that guarantees rationality when proposing solutions. Exquisitely pragmatic solutions that do not include a moment of reflection in the reading of reality distance the pedagogical moment from the reflective dimension. In fact, Pedagogical Problematicism has been the subject of multiple experiments and practical contexts in contemporary research (Frabboni, 1971; Contini, 1983; Cambi, 2000; Pinto Minerva, 2000; 2019). Above all, Frabboni (1985) addresses school and extracurricular issues through the lens of anti-dogmatism and the typical possibility of Problematicism. Among the various didactic models (or empirical methodologies) proposed, research-action emerges in particular, which favours field research with participatory and democratic dynamics of the groups of subjects involved. The object of investigation of research-action is socio-educational problems, faced by means of a practical theoretical model that turns out to be situational. This intervention, therefore, must not take place in the workshop to then be proposed in real contexts; the research-action must from the outset take place in the real context of the educational situation.

Moreover, the educator identifies reason as the only possibility for man to give meaning to his life. He wants man to realise and free himself. Therefore, according to the author, it is necessary to educate man on rationality or teach him to accept the problematic nature of the human condition with an active and combative, rather than passive, attitude.

Specifically, Bertin's pedagogical model revolves around three fundamental distinctions:

- the philosophical analysis of experience in general and the philosophical analysis of the educational experience;
- theory and practice in the pedagogical field;
- the transcendental philosophy of education and the philosophy of education implicit in a pedagogical model.

The idea of experience, the idea of problematicity, the idea of reason and ethical-rational commitment are the categorical structures that allow the philosophical analysis of experience. In particular,

1) The idea of experience is fundamentally important, not only because all the other categories revolve around its meaning but also, and most importantly, because it recognises the same value in both the subject and the object.
2) The idea of problematicity has a methodological and anti-dogmatic function, according to Bertin. A problematic attitude allows for multiple observational perspectives on a phenomenon or an experience.
3) The idea of reason is the general principle of resolving the problem. The reason that the pedagogist understands is critical rationalism.
4) Ethical-rational commitment is fundamental, as reality is not always rational. This happens because a problem can also be resolved irrationally. Thus, human responsibility requires a commitment that is both ethical and rational at the same time.

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After explaining the distinction between Philosophy of Education and Pedagogy, it is essential to highlight the problem between theory and practice, as introduced by these two disciplines.

Bertin recognises the theoretical task of understanding the Philosophy of Education and the pragmatic task of educational choice to Pedagogy in these two disciplines. He identifies Pedagogy as a science independent from the other social sciences only if it remains subordinate to Philosophy. This is because pedagogical knowledge must be subject to the transcendental law of education, which is philosophical in nature. The procedural model of Pedagogy is based on the methodological unity of the theoretical and the pragmatic moment, despite their conceptual distinction. This model is divided into two phases: philosophical and pragmatic. In fact, although Pedagogy is not faced with problems in an abstract sense, it cannot do without the theoretical moment. In this regard, when confronted with a plethora of theoretically legitimate possibilities, the educator does not run the risk of succumbing to dogmatism.

4. Methodology

The research objective of the study was to test the impact of learning to teach online on the motivation and perceived stress of trainee teachers in the selected setting. The proposed research is correlational in nature and presents descriptive and inferential statistical analyses.

Specifically, the objective of the study was to analyse the constructs of stress and motivation in teachers with respect to online teaching training. The research hypotheses were related to the impact of online teacher training on teachers' stress and motivation and base their interest in the recent relevant literature. Indeed, the pandemic (COVID-19) has developed the preferred way of digital education to deliver teaching to all levels of schools worldwide.

A social and educational phenomenon of this magnitude has motivated psychologists and educators on the problems of learning related to motivation and distance learning and teacher's professional competence. Experiments in mixed, hybrid and online training have been performed for many years, aiming to measure the negative and positive impacts on students with respect to the effectiveness of learning (Wu & Nian, 2021). The pandemic has profoundly changed the self-efficacy, professional modality and motivation of teachers about online teaching.

Within this context, the University of Foggia was selected due to its work model, which supports the first-hand experimentation of innovative teaching methodologies related to knowledge transfer, gamification and media education in the daily context of professional life. These three dimensions were monitored for future hybrid and online teaching in schools.

This study was conducted in the Italian setting in which teachers on specialisation courses were teaching online, and grouped the teachers at national level, thus with students from all over Italy (67% from Southern Italy). The specialisation courses in question are also intended for in-service teachers of all grades.

The University of Foggia, which started in the past ten years, has been a leader in online teaching and distance learning (involving internships and workshops) since December 2020, and delivered the specialisation course to

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teachers for the third time. Therefore, the reference sample consists of teachers of all levels enrolled in the third edition of the specialisation course (2019/2020) (n=1411).

The aim of this contribution is to put into practice the typical constructs of Bertin's Problematicism through feasible educational proposals for the contemporary teaching profession. Specifically, the aim is to apply and investigate an important theoretical model in pedagogical studies and trace its contemporary didactic applications in educational practice.

The respondents were the teachers who delivered the lessons in their school level, and students who followed their courses completely online (internships, workshops and lessons). This research used three scales: online teacher training, stress and motivation. The respondents came from various areas of Italy.

The data was collected via an online survey with two sections: demographic profile and scales. The demographic data included gender, age and school level (kindergarten, primary, middle school and high school). The data were collected in December 2020.

The following scales were included in the online questionnaire.

- Online teaching learning (OTL): it measures the challenges experienced by teachers in online teaching (Tsitsia, 2020) and includes seven items (e.g., Taking the online course makes me feel motivated; Online I can access information and communicate effectively). The responses were measured on the 5-point Likert scale (1=strongly disagree; 5=strongly agree). The study of Ghazali (2008) reported that scale should have alpha value .60 to ensure appropriate reliability.
- Perceived stress scale (PSS): introduced by Sheldon Cohen (2021), it includes 10 items (e.g., In the past month, how often have you felt nervous and stressed?; In the past month, how often have you felt confident in your ability to handle your personal problems?). The responses were recorded on the 5-point Likert scale (1=Never; 5=Very) (Deemah et al., 2020). If the scale had a total mean score of 0-13 it was considered a low stress level, while a mean score of 14-26 indicated moderate stress and 27-40 revealed high stress levels. The PSS is widely and easily applied tool with considerable psychometric properties (Taylor, 2015). The study of Roberti and colleagues (2006) reported that PSS must have a reliability range of .82 and .85 respectively.
- Teacher motivation scale (TMS): developed by Guajardo (2011), it includes 12 items (e.g., Teachers have opportunities to become formal mentors to other teachers; Teachers are confident in their ability to do their jobs well). The responses were evaluated on the 5-point Likert scale (1 = not at all true of me; 5 = very true). The current research used the alpha value .79. The questionnaire was translated to Italian from English by an English native. Any discrepancies in the Italian and back translations were highlighted and solved by the authors with consensus.

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5. Results

5.1 Data screening

All data was analysed using the SPSS 23 software. Data screening was performed for the multivariate and univariate outliers. Univariate outliers were identified by the Z-score test. More importantly, all respondents had a z-score value greater than +3 or less than -3, the variables with greater values were removed from the analysis. Ten univariate outliers were identified and removed from the data. The Mahalanobis distance was used to record the multivariate outliers. No multivariate outliers were detected in the data. The final sample size was 1400 individuals.

Variables	Descriptives	Statistic	Std. Error
OTL	Mean	2.35	.01
	Lower Bound (95% confidence)	2.32	
	Upper Bound (95% confidence)	2.39	
	Median	2.28	
	Mode	2.14	
	Std. Deviation	.68	
	Variance	.46	
	Skewness	.64	.06
	Kurtosis	.85	.13
	Range	4.00	
	Minimum	1.00	
	Maximum	5.00	
	Sum	3243.00	
PSS	Mean	3.54	.01
	Lower Bound (95% confidence)	3.52	
	Upper Bound (95% confidence)	3.56	
	Median	3.60	
	Mode	3.50	
	Std. Deviation	.39	
	Variance	.15	
	Skewness	.33	.06
	Kurtosis	-.02	.1
	Range	3.20	
	Minimum	1.80	
	Maximum	5.00	
	Sum	4873.60	
MO	Mean	2.82	.01
	Lower Bound (95% confidence)	2.80	
	Upper Bound (95% confidence)	2.84	

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Median	2.80	
Mode	2.80	
Std. Deviation	.38	
Variance	.145	
Skewness	-.06	.06
Kurtosis	-.19	.10
Range	6.50	
Minimum	1.60	
Maximum	8.10	
Sum	3891.90	

Table 1: Data screening

In the next stage, the kurtosis and skewness of variables were determined to find out the normal distribution. Table 1 shows that both the kurtosis and skewness of variables were in the range of +1 and -1, thus all constructs had normal distribution.

5.2 Descriptive statistics

After data screening, descriptive statistics were recorded for the demographic variables. In the sample of 1400 individuals, 198 individuals were male, with an average age of 37.3, while 1202 individuals were female, average age 39.8. In both cases, the majority of individuals in the sample worked in middle schools (31%). In addition, the sample consists of 1400 (out of a total of 1411 enrolled) because 11 questionnaires were incomplete.

Gender		**N**	**Mean**	**Std. Deviation**
Male	Age	211	37.27	7.79
	School level	211	3.43	.68
	OTL	211	2.38	.74
	PSS	211	3.56	.39
	M	197	2.85	.38
	Valid N (listwise)	197		
Female	Age	1200	39.77	7.45
	School level	1200	2.56	1.06
	OTL	1200	2.35	.66
	PSS	1200	3.53	.39
	M	1179	2.82	.38
	Valid N (listwise)	1179		

Table 2: Descriptive Statistics

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5.3 Reliability Analysis

To check the consistency of the results, the Cronbach alpha test was applied. The results are given in Table 3. Online teaching learning (OTL) consisted of seven items with coefficient α=.82. The perceived stress scale had 10 items with coefficient α=.85. Lastly, the motivation scale had twelve items with coefficient α=.89. All scales were reliable because the values were above .70 (Cronbach, 1951).

Scales	**Items**	**α**
Online teaching learning (OTL)	7 items	.82
Perceived stress (PSS)	10 items	.85
Motivation (MO)	12 items	.89

Table 3: Reliability analysis

5.4 Correlation

The Pearson correlation was applied to find out the correlation among study variables (Table 4). The correlation results showed that OTL and motivation had a negative (r=-.13, p<.05), OTL and PSS a positive (r=.12, p<.05), PSS and MO a negative (r=-.12, p<.05) correlation. The increase in online teaching lowered motivation and an increase in perceived stress decreased the teachers' motivation. Furthermore, the increase in online teaching increased the teachers' perceived stress (see Table 4).

Study variables	**Gender**	**Age**	**School level**	**OTL**	**PSS**	**MO**
Gender	1					
Age	.118**	1				
Grade of School	-.291**	-.237**	1			
OTL	-.017**	-.106**	.042	1		
PSS	-.030**	-.138**	.136**	.129**	1	
MO	-.029**	.016**	-.047**	-.130**	-.121**	1

Table 4: Correlations

5.5 Confirmatory factor analysis

To check the validity of the online teaching learning, perceived stress and motivation scales, a confirmatory factor analysis (CFA) was performed. All items were tested through a principal axis factor analysis with varimax rotation. The Kaiser-Meyer-Olkin (KMO) measured the sampling adequacy and Bartlett's sphericity test was significant, confirming that the data were appropriate for the factor analysis, with OTL (X2(21) =3650.923, KMO=.84, p <.05), PSS (X2(45) =4257.441, KMO=.88, p <.05) and MO (X2(21) = 1099.189, KMO=.77, p

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<.05) (see Table 5). Almost all items met the three criteria including 1) the communality value was above .500, 2) the factor loading was at least .40 and 3) there was no cross-loading. The items of OTL explained 50.93%, PSS items 54.12% and MO items 52.38% variance, which was due to the single factor. Table 6 presents the final results of the factor loading of the scales.

		OTL	**PSS**	**M**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.840	.884	.775
Bartlett's Test of Sphericity	Approx. Chi-Square	3650.923	4257.441	1099.189
	Df	21	45	21
	Sig.	.000	.000	.000
Percentage of variance		50.93	54.12	52.38

Table 5: KMO and Bartlett's Test

Sr.	**Items of scale**	**Factor Loading[a]**
1	OTL1	
2	OTL2	.731
3	OTL3	.750
4	OTL4	.819
5	OTL5	.791
6	OTL6	.732
7	OTL7	.766
8	PSS1	.724
9	PSS2	.737
10	PSS3	.683
11	PSS4	.724
12	PSS5	.686
13	PSS6	.710
14	PSS7	.653
15	PSS8	.712
16	PSS9	.729
17	PSS10	.710
18	MO1	.634
19	MO2	.600
20	MO3	.808
21	MO4	.717
22	MO5	.784
23	MO6	.781
24	MO7	.841

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25	MO8	.715
26	MO9	.816
27	MO10	.726
28	MO11	.738
29	MO12	.821

Extraction Method: Principal Component Analysis.
a. 1 component extracted.

Table 6: Factor loading

5.6 ANOVA test

The ANOVA test was conducted to investigate the difference in motivation, stress and online teaching with respect to school level and gender. Table 7 gives the results of the ANOVA test. OTL was (Mean Square=.46, F=2.32, p<.05), PSS was (Mean square=1.83, F=11.9, p<.05) and Motivation was (Mean Square=1.97, F=4.55, p <.05), which were significant. This means that the online teaching learning, perceived stress and motivation levels differ in kindergarten, primary, middle school, and high school levels.

		Sum of squares	**df**	**Mean Square**	**F**	**Sig.**
OTL	**Between Groups**	3.22	3	1.07	2.32	.013
	Within Groups	650.21	1407	.46		
	Total	653.44	1410			
PSS	**Between Groups**	5.50	3	1.83	11.97	.000
	Within Groups	215.74	1407	.15		
	Total	221.25	1410			
MO	**Between Groups**	1.97	3	.65	4.55	.004
	Within Groups	197.96	1372	.14		
	Total	199.93	1375			

Table 7: ANOVA by school level

Table 8 gives the results of the ANOVA test by gender. OTL was (Mean Square=.46, F=.04, p<.05), PSS was (Mean square=.20 F=1.31, p<.05) and Motivation was (Mean Square=.16, F=1.15, p <.05), which were significant. This means that the online teaching learning, perceived stress and motivation levels differ between female and male.

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		Sum of Squares	df	Mean Square	F	Sig.
OTL	**Between Groups**	.18	1	.18	.40	.005
	Within Groups	653.25	1409	.46		
	Total	653.44	1410			
PSS	**Between Groups**	.20	1	.20	1.31	.002
	Within Groups	221.05	1409	.15		
	Total	221.25	1410			
MO	**Between Groups**	.16	1	.16	1.14	.005
	Within Groups	199.77	1374	.145		
	Total	199.93	1375			

Table 8: ANOVA by gender

5.7 Regression analysis

5.7.1 The relationship between online teaching learning and perceived stress

5.7.1.1 School level

The association between OTL and PSS was tested according to the school level through regression. The model 1, 2, 3 and 4 stated that OTL impacted stress in kindergarten (R2 =.02, β=.14, p<.05), primary (R2 =.04, β=.22, p<.05), middle (R2 =.01, β=.09, p<.05), and high school (R2 =.02, β=.05, p<.05) significantly. This shows that stress was caused by online teaching in all school levels. The increase in online teaching increased the stress levels. Therefore, the hypothesis was supported, as the relationship between OTL and PSS was confirmed.

School level	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Kindergarten	1	.144[a]	.021	.017	.42244
Primary	2	.222[a]	.049	.046	.39918
middle school	3	.098[a]	.010	.007	.35607
high school	4	.054[a]	.003	.000	.39129

a. Predictors: (Constant), OTL

Table 9: Model Summary

School level	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
kindergarten	**1**	**(Constant)**	3.226	.099		32.576	.000
		OTL	.094	.041	.144	2.291	.023
primary	**2**	**(Constant)**	3.161	.082		38.378	.000

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		OTL	.141	.035	.222	4.081	.000
middle school	**3**	**(Constant)**	3.480	.061		56.829	.000
		OTL	.050	.024	.098	2.065	.040
high school	**4**	**(Constant)**	3.508	.069		51.032	.000
		OTL	.030	.028	.054	2.067	.007
Dependent Variable: PSS							

Table 10: Coefficients

5.7.1.1 Gender

The association between OTL and PSS was tested according to gender. Model 1 shows that OTL impacted stress in females (R2 =.02, β=.16, p<.05) significantly, but the relationship was not confirmed for males. It shows that females suffered more stress due to online teaching. The increase in online teaching increased stress among females. Therefore, the hypothesis was confirmed as the relationship between OTL and PSS was confirmed for females.

Gender	**Model**	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
Male	1	.048[a]	.002	-.002	.39685
Female	2	.163[a]	.027	.026	.39089
a. Predictors: (Constant), OTL					

Table 11: Model Summary

Gender	**Model**		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
			B	**Std. Error**	**Beta**		
Male	**1**	**(Constant)**	3.630	.092		39.341	.000
		OTL	-.026	.037	-.048	-.691	.490
Female	**2**	**(Constant)**	3.308	.041		80.265	.000
		OTL	.097	.017	.163	5.727	.000
Dependent Variable: PSS							

Table 12: Coefficients

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5.7.2 The relationship between online teaching learning and MO

5.7.2.1 School level

The association between OTL and MO was also tested according to the school level. Models 1, 2, 3 and 4 showed that OTL impacted motivation in kindergarten (R^2 =.08, β=-.28, p<.05), primary (R^2 =.01, β=-.11, p<.05), middle school (R^2 =.02, β=-.08, p<.05) and high school (R^2 =.01, β=-.10, p<.05) significantly. It shows that motivation was negatively affected by online teaching in all school levels. The increase in online teaching decreased motivation. Therefore, the hypothesis was supported as the relationship between OTL and MO was confirmed.

School level	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Kindergarten	1	.285[a]	.081	.078	.30135
Primary	2	.115[a]	.013	.010	.33931
middle school	3	.083[a]	.027	.005	.34757
high school	4	.104[a]	.011	.008	.47078

a. Predictors: (Constant), OTL

Table 13: Model Summary

School level	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
kindergarten	**1**	**(Constant)**	3.179	.071		44.544	.000
		OTL	-.138	.030	-.285	-4.660	.000
primary	**2**	**(Constant)**	3.011	.071		42.321	.000
		OTL	-.061	.030	-.115	-2.052	.041
middle school	**3**	**(Constant)**	2.876	.060		47.595	.000
		OTL	-.041	.024	-.083	-2.722	.006
high school	**4**	**(Constant)**	2.996	.084		35.803	.000
		OTL	-.069	.034	-.104	-2.026	.043

Dependent Variable: MO

Table 14: Coefficients

5.7.2.2 Gender

The association between OTL and MO was tested according to gender. Model 1 shows that the impact of OTL on MO in females (R^2 =.02, β=-.14, p<.05) was negatively significant, but the relationship was not confirmed

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for males. This shows that the motivation of female teachers decreased due to online teaching. The increase in online teaching decreased motivation for teaching in females. Therefore, the hypothesis was supported as the relationship between OTL and MO was confirmed for females.

Gender	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Male	1	.035[a]	.001	-.004	.38730
Female	2	.149[a]	.022	.021	.37633
a. Predictors: (Constant), OTL					

Table 15: Model Summary

Gender	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Male	**1**	**(Constant)**	2.899	.092		31.582	.000
		OTL	-.018	.037	-.035	-.496	.621
Female	**2**	**(Constant)**	3.024	.040		75.364	.000
		OTL	-.085	.016	-.149	-5.176	.000
Dependent Variable: MO							

Table 16: Coefficients

6. Discussion and Conclusion

The research objectives of the study were to test the impact of online teaching learning on stress and motivation and to check the differences in relation to school level and gender. The results found that the relationship between OTL and PSS and OTL and MO were confirmed for all school levels and females, but not males. The socio cognitive model was used to improve digital technology in the teacher's professional practice, which was based on three factors: socio-environment, behaviour and personal factors. In this research, three factors of stress, motivation and online teaching were operationalized and confirmed. These factors impact each other, however contemporary studies have tested their impact on learning and teaching (Panisoara et al., 2020; Salikhova et al., 2020).

During the pandemic, the arduous process of introducing technologies into formal learning environments has accelerated. Immersive and virtual learning environments was the solution for all training levels. The gradual? integration process demands digital competences which are included in the guidelines and policies for school teachers. The process should be aligned by designing and planning the teacher education and training in the use

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of technologies in the class setting (Toto & Limone, 2021). In this study, the student category also included those individuals who had dual role, both as teacher in-service and student in the professional training course in the professional practice. The emergency situation has had significant repercussions on the academic and school context; the sudden transmission, prolonged closures and the construction of online contents had an influence on different levels. Onyema et al. (2020) pointed out the main repercussions, including the need of renewal of learning methods, social isolation, and increased socioeconomic inequality due to the digital divide (Cucco et al., 2021). The outcomes have been twofold for education professionals: on the other hand, the quick transformation of personal teaching styles and practices caused more stress and low motivation among females because they were not trained in or familiar with the use of new technologies. But in future, new teaching methods will be useful for increasing motivation.

Teachers are the main players in the process of academic rehabilitation. Research performed by the Italian Society of Didactic Research (SIRD) indicated that the key issues included a lack of preparation in managing the new teaching methods and implications relating to the total reorganisation of teaching practices linked to excessive workloads in terms of timing and construction. However, Ardizzoni and colleagues (2020) reported that the use of technologies in education has played a supportive role in student management dynamics. Nevertheless, the difficulties in reaching the students in the fragile condition and using the devices remained unchanged. On the other hand, it is suggested that the use of digital technologies has offered teachers the chance to see the potential link with implementation of new methodologies. It appears that teaching through digital platforms stimulates the students to optimise and learn the class environment (Tan & Hsu, 2018). Thus, teachers have gradually reinvented their teaching methods and motivated the other teachers in taking lifelong-learning training courses.

The method of using technology in the classroom setting has undergone a gradual technological evolution. In this situation, the dynamic of motivation has emerged: the motivation oscillates as per the socio-cognitive theory among performance expectation, value attribution and self-efficacy. In fact, teachers have competence needs, autonomy needs and relationship needs (Sprenger & Schwaninger, 2021). While it is true that digital learning, stress and motivation directly influence the teacher's professional vision, it is also accurate that their desire for career development, teacher's perceptions and risks knowledge and technologies benefits inside the process of teaching have secondary impacts on the professional teaching.

The significance of the results allows the researcher to demonstrate the factors that are essential for improving professional vision. Hence, career prospects are related to school governance, leadership, risk/benefit, knowledge and personal beliefs, and training interventions targeting in-service teachers are needed to improve teaching performance (Fan & Tan, 2019). When online teaching learning does not produce positive consequences, this may be due to limited self-efficacy, beliefs, low self-esteem and limited social support, and will become a source of stress for students, teachers and the social context as a whole. A maladaptive response to change triggered by technologies in work contexts generates stress for teachers. Perceived stress is linked to a lack of predictability and control rather than related to stressful events. The negative impacts of perceived stress

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related to technology is the structure of dysfunctional coping mechanisms. Bolatov et al. (2021) reported that teachers have non-acceptance of and resistance to digital technology. The need therefore emerges to investigate the studies in this field in order to identify teaching and learning models that support motivation and minimise the impact of stress on online teaching.

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Giusi Antonia Toto is researcher in Experimental Pedagogy at the University of Foggia. Her research interests focus on cognitive skills, teaching methodologies and information and communication technologies. For years she has focused her research on the relationship between learning and digital media and on the psychological effects of online learning. She is a member of the Learning Science hub (LSH).
Contact: giusy.toto@unifg.it

Pierpaolo Limone is Full Professor of Developmental and Educational Psychology at the University of Foggia, where he also holds the position of rector since 2019. Two years after assuming the rector's office, he received from CRUI the national delegations for orientation, teacher training, ITS and life-long learning. Co-founder of the national e-learning platform EduOpen, he represents Italy at the European Mooc Consortium (EMC). He is a member of the Learning Science hub (LSH).
Contact: pierpaolo.limone@unifg.it

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