THE IMPACT OF THE VIRTUAL INDUCTION PROGRAM, TRAINING AND PROFESSIONAL DEVELOPMENT ON SELF-EFFICACY AND TEACHING PRACTICES: A SCHOOL GOVERNANCE IMPLICATION

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Abstract

Virtual induction and training have been used in many sectors including education (Andrade-Arenas et al., 2022; Martín-Gutiérrez et al., 2017). This study aims to explore the impact of a virtual induction program (VIP) and training and professional development (TPD) on teachers' self-efficacy (SE) and teaching practices (TP). The study tries to test different models that are designed to understand different relationships. The study adopts the quantitative study design and uses secondary data prepared by the Organization for Economic Co-operation and Development (OECD). Data from this study was analyzed using structural equation modeling (SEM) to explore the impact of the independent variables (online induction program and training and development program) on the dependent variables (teachers' *SE* and *TP*). The findings of this study show that virtual induction and online training will not help teachers improve their SE due to many factors explained by the researcher. The analysis shows a significant relationship between the main independent variables (*VIP, TPD*) and the dependent variables (*SE, TP*). The study provides recommendations for policymakers and decision-makers. The findings of the study have different implications in education, management, and social life. It is highly recommended for schools and universities to conduct face-to-face induction programs as well as training. This leads to improved teachers' SE and their TP.

Keywords: Virtual Induction, Training, Professional Development, Self-Efficacy, Teaching Practices

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1. INTRODUCTION

Induction is very important for the teaching profession. A vital aspect of the teaching profession, induction has a big impact on new teachers' success and retention (Han, 2023). Studies emphasize the value of planned induction programs that offer guidance and assistance, eventually improving teacher satisfaction and the quality of instruction (Geter, 2024; Ponomareva, 2021). As the analysis of teacher training needs makes clear, induction is essential for new teachers as it helps with quality instruction, classroom management, and integration into the educational community (Glava et al., 2023). The utilization of novel technologies, like virtual reality (VR), enables the facilitation of instruction in comparison to conventional approaches, which have exhibited significant constraints in their capacity to captivate young students who have been raised in the smartphone culture of uninterrupted amusement. The utilization of cutting-edge technologies like VR in the realm of instructional sessions has gained momentum in recent times due to the significant strides made in this field of science and technology. Numerous benefits can be obtained from its implementation in training, as its usage is not confined to any particular domain (Checa et al., 2022).

The utilization of VR in the context of training yields a notably substantial ratio of cost-effectiveness. This is primarily due to its capacity to facilitate highly precise learning, decrease learning durations, and augment visualization and comprehension (Checa & Bustillo, 2020). Moreover, it enables the prompt application of behavioral competencies acquired in VR settings to real-life scenarios. Furthermore, it amplifies the potential for skill development in an environment devoid of risks (Lele, 2013). From a pedagogical standpoint, VR environments enable the faithful replication of laboratory and test bench settings. This replication achieves a remarkable level of similarity to real-world environments. Furthermore, VR eliminates the requirement for financial investments and economic setbacks. Additionally, it prevents any potential harm or damage to laboratory equipment and avoids disruption to industrial processes during training and development (Checa et al., 2022).

A teacher's knowledge and practice can be changed through organized professional learning, which is known as successful professional development (Darling-Hammond, 2017). A strong topic focus, active learning, collaboration, alignment with pertinent policies and curriculum, and ample learning time for participation are all characteristics of effective professional growth. There are significant variations in instructional staff development throughout European university systems, specialties, and types of institutions (European University Association, 2019; Desimone, 2009). Prior research has shown how crucial it is to assist academic staff members in their professional growth, particularly by offering them training in innovative pedagogies and instructional techniques (Al-Hattami et al., 2013; Manatos et al., 2017). The research on the professional growth of educators has addressed several issues, one of which is the institutional support systems for educators (Elmahdi et al., 2015; Kamel, 2016).

This paper aims to understand how virtual and online induction program affects teacher self-efficacy (SE) and their teaching practices (TP). In addition, the study tries to adopt different models to understand these relationships taking into account the moderating role of the working environment. The purpose of this study is to investigate how virtual induction programs (VIPs) can improve the efficacy and confidence of novice teachers in the classroom. The study also emphasizes the value of continuous feedback and assistance, which can help teachers become more flexible and adaptive in a variety of learning environments.

This study tries to fill the gap in the current literature by focusing on the relationship between VIP, training and professional development (TPD) on SE and TP. The findings of this study are expected to enhance the decision-maker's ability to formulate effective virtual orientation for new faculty members.

The rest of this paper consists of four main sections. The literature review is presented in Section 2, the methodology is described in Section 3, the results are provided in Section 4, the discussion is outlined in Section 5, and the conclusion and suggestions are analyzed in Section 6.

2. LITERATURE REVIEW

Enhancing teaching and learning requires teacher training (Asfahani et al., 2024; Curtis & Carter, 2007). It supports educators in keeping up with new developments in the field of education, taking on new difficulties, and adapting to them (Omar, 2014). The effectiveness and work performance of teachers can be improved with in-service training (Pickett, 1995; Yeboah et al., 2023).

Teacher education programs that have focused on training educators to work in high-poverty schools or in classes with various cultural and linguistic origins have highlighted the significance of preparing teachers in those communities (Ball, 2009; Lampert et al., 2020). A preliminary investigation into the professional development of teachers in four Latin American schools serving as learning communities revealed some essential elements that have made this model adaptable to other educational settings (Garcia-Carrion et al., 2017). Enhancing teaching techniques is greatly aided by training and development strategies. The literature on teacher preparation highlights the significance of lifelong learning and professional development for educators, which in turn impacts the enhancement of the educational system and the processes of teaching and learning (de Castro & García-Peñalvo, 2022). It has been discovered that the training of trainers (ToT) model is a successful strategy for faculty professional development, giving them chances to improve their expertise and knowledge (de Castro & García-Peñalvo, 2022). As a type of hands-on training for aspiring educators, pedagogical practice is essential to the growth of professional skills and the consolidation of knowledge about pedagogy and instructional strategies (Moton & Wiltsher, 2022). To support pedagogical methods that advance knowledge production and student leadership and are consistent with the objectives specified in the National Common Curricular Base (BNCC), teacher continuing education is crucial (Barbosa & de Camargo Libos, 2018).

Teachers who have high SE typically possess greater confidence when implementing student-centered, active teaching approaches. In other words, self-effective educators welcome change and are keen to implement fresh approaches and techniques in the classroom (Saracaloğlu & Yenice, 2009). Teachers who receive training are more prepared to tackle issues in the classroom. As a result, they

become more self-assured and self-sufficient (Bandura, 2013). Teachers are better equipped to handle problems when their unique needs and challenges are taken care of through professional development. SE is strengthened by this sense of mastery (Cakiroglu et al., 2012).

H1: Training and development practices are significantly related to teaching practices.

H2: Training and development practices are significantly related to teachers' self-efficacy.

According to the body of research on induction procedures, successful onboarding and orientation procedures for new hires are essential to the success of an organization (Godinho et al., 2023; Stein & Christiansen, 2010). Empirical studies suggest that effectively crafted onboarding initiatives can result in increased job contentment, productivity, and staff retention rates (Bauer & Erdogan, 2011; Bell, 2021; Patel & Mohanty, 2023). Furthermore, the literature in this area as a whole emphasizes how critical it is for new hires to be socialized and integrated into the organizational culture (Ross et al., 2014).

Research indicates that a warm and encouraging atmosphere throughout the onboarding process can foster a sense of belonging and engagement in new hires, which benefits the company as a whole as well as the individual (Caldwell & Peters, 2018). It has been discovered that induction programs significantly affect instructional strategies (Abdallah & Alkaabi, 2023). According to the evaluated studies, induction programs have a positive impact on both student success and teachers' classroom practices (Mathieson et al., 2023). Nonetheless, some research indicates that there is no meaningful correlation between children's academic success and instructors' onboarding (Antonsen et al., 2023).

Teachers' SE is positively impacted by induction programs (Abdallah & Alkaabi, 2023; Han, 2023). These programs assist new teachers feel more confident in their abilities and improve their teaching methods by offering them training, support, and supervision. Research has indicated that educators who take part in onboarding programs have a higher likelihood of remaining in the field and experiencing greater levels of job satisfaction (Munshi, 2018). Numerous studies have examined the workplace as a moderating influence. In our model, we try to fill the gap in the previous studies by exploring the moderated role of the working environment in the relationship between the main dependent and independent variables.

H3: Virtual induction practices are significantly related to teaching practices.

H4: Virtual induction practices are significantly related to teachers' self-efficacy.

Figure 1. Research model

Training and professional development (*TDP*)

Self-efficacy (*SE*)

Virtual induction program (*VIP*)

Teaching practices (*TP*)
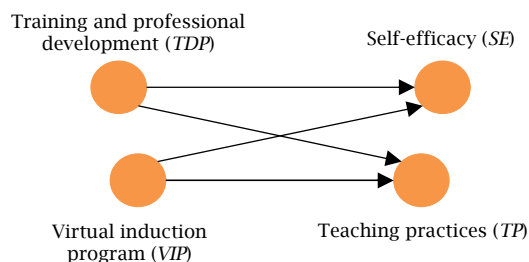
3. RESEARCH METHODOLOGY

Data utilized in this study was acquired from an investigation overseen by the Organization for Economic Co-operation and Development (OECD) (Ainley & Carstens, 2018). The Teaching and Learning International Survey (TALIS) presented a survey encompassing over 245,644 educators across many nations and economies (Ainley & Carstens, 2018). The overall count of countries taking part in this examination amounts to 47. This particular study gathers information that addresses various facets and parameters of educators' professional lives, including job autonomy, job satisfaction, well-being, job stress, and motivation. The dataset of this research comprises approximately 153,682 educators at the lower secondary level who participated in the survey. Among them, (30.9%) are male educators while (69.1%) are female educators. The TALIS is a thorough survey that collects information on the learning settings and working circumstances of teachers in different countries' schools. In order to inform policy decisions and advance practices in education systems across the globe, the study seeks to shed light on the ways in which these variables affect teacher effectiveness and educational outcomes. The results of TALIS draw attention to important topics such as teacher cooperation, professional development, and classroom management techniques, all of which are crucial for creating a supportive learning environment. TALIS also highlights the value of school culture and supportive leadership in raising student engagement and teacher satisfaction.

4. RESEARCH RESULTS

Understanding the distinct conceptualizations of the four models is crucial for gaining insights into the complex relationships among *TDP*, *VIP*, and *SE*, *TP* within our structural equation modeling (SEM) analysis by covariance-based (CB-SEM).

Model 1: This model comprises four latent variables: *TDP*, *VIP*, and *SE*, with *TP* as the dependent variable. As represented in Figure 2.

Model 2: Like Model 1, this model includes the same latent variables. In addition, workplace (*WOC*) as an independent variable, is depicted in Figure 3.

Model 3: In this model, it conceder the variable *WOC* as a mediator, this relationship appears in Figure 4.

Model 4: In model four, the variable as a moderator between the independent and dependent variables relationship is shown in Figure 5.

To corroborate the conclusions drawn regarding the models' fit, we reference the tables detailing the statistical analyses conducted for each model. Table 1 outlines various fit indices and statistical tests, revealing consistent patterns across the models. Notably, Model 1 consistently demonstrates lower Akaike information criterion (AIC) and Bayesian information criterion (BIC) values compared to Models 2, 3, and 4, indicating its superior fit.

Additionally, the x^2 values in Model 1 are substantially lower, suggesting a better fit to the observed data. Moreover, the p-values for all models are less than 0.001, indicative of a good fit, with Model 1 even demonstrating a perfect fit ($p = 1.000$).
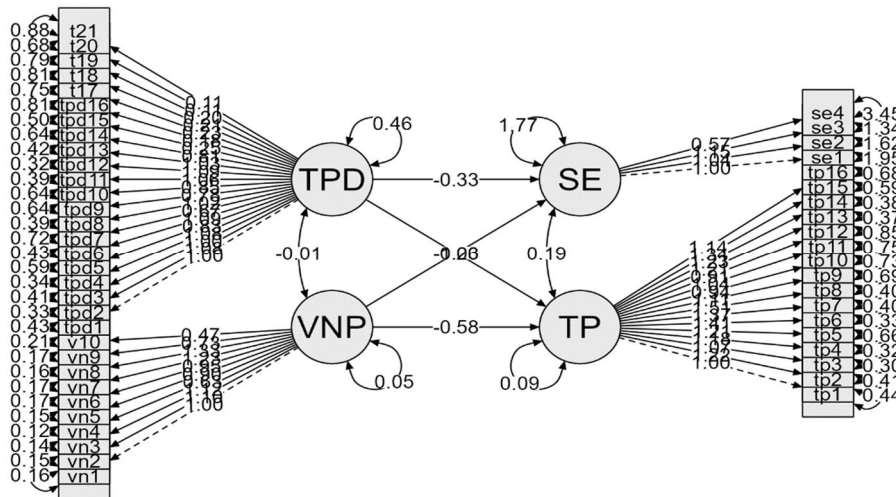
Figure 2. The first structural equation model

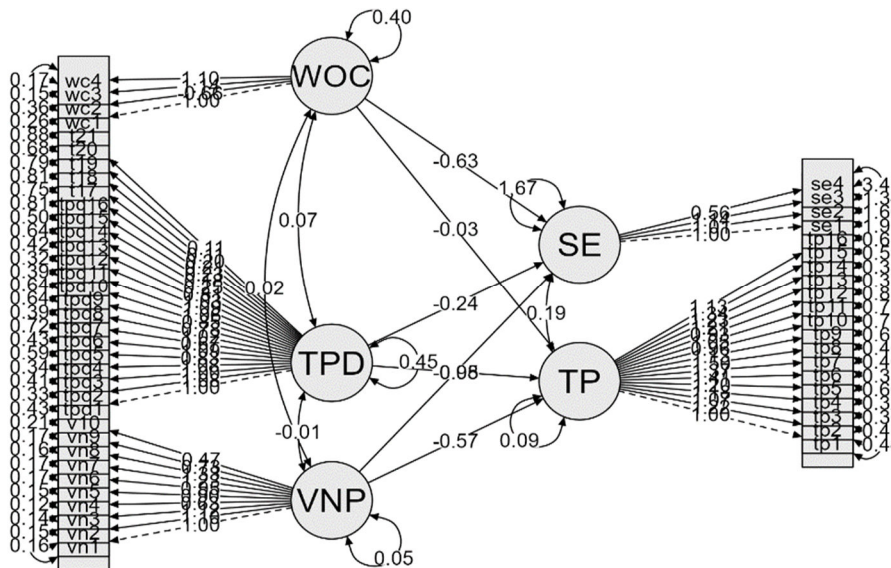**Figure 3.** The second structural equation model
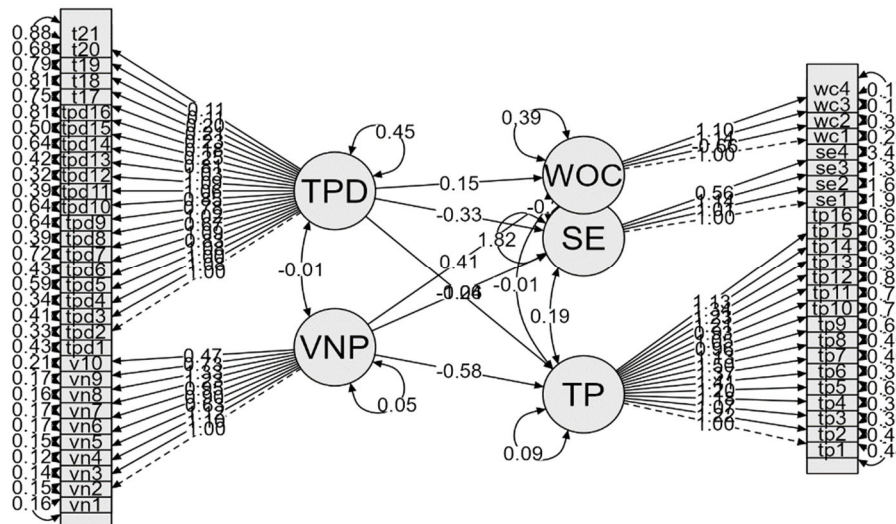

Figure 4. The third structural equation model
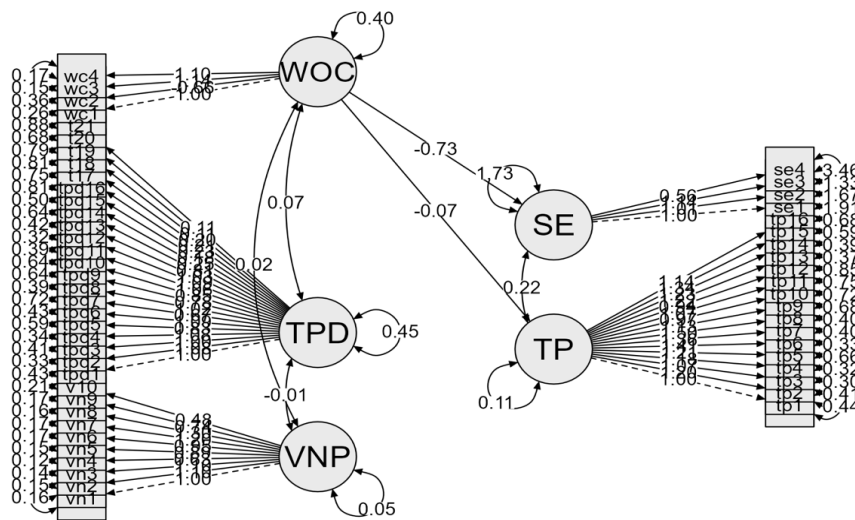
Figure 5. The fourth structural equation model

Table 1. Model fit indices

Index	Good fit	Model 1	Model 2	Model 3	Model 4
Comparative fit index (CFI)	> 0.9	0.670	0.693	0.693	0.684
T-size CFI	> 0.9	0.666	0.690	0.690	0.681
Tucker-Lewis index (TLI)	> 0.9	0.654	0.679	0.679	0.671
Bentler-Bonett non-normed fit index (NNFI)	> 0.8	0.654	0.679	0.679	0.671
Bentler-Bonett normed fit index (NFI)	> 0.9	0.669	0.692	0.692	0.683
Parsimony normed fit index (PNFI)	> 0.9	0.639	0.662	0.662	0.655
Bollen's relative fit index (RFI)	> 0.9	0.653	0.678	0.678	0.670
Bollen's incremental fit index (IFI)	> 0.9	0.670	0.693	0.693	0.684
Relative no centrality index (RNI)	> 0.9	0.670	0.693	0.693	0.684

Further support for Model 1's superior fit is provided by the comparative fit indices presented in Table 1. Across indices such as CFI, TLI, NNFI, NFI, PNFI, RFI, IFI, and RNI, Model 1 consistently exhibits higher values, signifying its superior fit compared to the other models.

Based on the comprehensive analysis of model fit indices, Model 1 emerges as the most appropriate model for explaining the observed data, suggesting its potential utility in understanding the underlying relationships between variables related to diabetes management and its outcomes. This includes variables such as demographic factors, treatment adherence, and health outcomes.

Table 2. Model information criteria

Panel A: Information criteria				
Parameter	Model 1	Model 2	Model 3	Model 4
Log-likelihood	$-2.994 \times 10 + 6$	$-3.176 \times 10 + 6$	$-3.176 \times 10 + 6$	$-3.181 \times 10 + 6$
Number of free parameters	108.000	120.000	120.000	115.000
AIC	$5.988 \times 10 + 6$	$6.352 \times 10 + 6$	$6.352 \times 10 + 6$	$6.362 \times 10 + 6$
BIC	$5.989 \times 10 + 6$	$6.353 \times 10 + 6$	$6.353 \times 10 + 6$	$6.363 \times 10 + 6$
Sample-size adjusted Bayesian (SSABIC)	$5.989 \times 10 + 6$	$6.352 \times 10 + 6$	$6.352 \times 10 + 6$	$6.363 \times 10 + 6$
Panel B: Goodness-of-fit indices				
Parameter	Good fit	Model 1	Model 2	Model 3	Model 4
Root mean square error of approximation (RMSEA)	< 0.08	0.070	0.067	0.067	0.068
RMSEA 90% CI lower bound	0.08	0.070	0.067	0.067	0.067
RMSEA 90% CI upper bound	0.1	0.071	0.067	0.067	0.068
RMSEA p-value	< 0.08	0.000	0.000	0.000	0.000
T-size RMSEA		0.071	0.067	0.067	0.068
Standardized root mean square residual (SRMR)	< 0.05	0.069	0.072	0.072	0.081
Hoelter's critical N ($\alpha = 0.05$)		215.582	238.718	238.718	232.533
Hoelter's critical N ($\alpha = 0.01$)		221.432	244.726	244.726	238.374
Goodness of fit index (GFI)	≤ 1.0	0.759	0.759	0.759	0.754
McDonald fit index (MFI)	0.1	0.049	0.042	0.042	0.039
Expected cross-validation index (ECVI)		6.064	6.351	6.351	6.543

Table 2 presents the results of comparing four different models based on various GIFs and information criteria.

Model 1 exhibits the lowest values for information criteria metrics, including AIC, BIC, and SSABIC, suggesting superior model fit compared to the other models.

the other models. Additionally, Model 4 demonstrates favorable GIFs, such as an RMSEA close to zero and an SRMR below the recommended threshold of 0.05, indicating a good fit to the data.

Furthermore, Model 1 surpasses the other models in terms of Hoelter's critical N-values,

indicating adequate sample sizes for significance testing (Hoelter, 1983). The GFI and MFI values are close to 1.0, indicating excellent model fit (Marsh et al., 2005). Furthermore, our analysis aimed to assess the influence of various indicators on four latent variables *TDP*, *VIP*, *SE*, and *TP*, in addition to

WOC as perhaps a mediator or moderator. By examining both z-values and estimate values, we identified key indicators significantly impacting each latent variable. In conclusion to all results of indicators, it concludes that Model 1 is the best, so it may now discuss its estimated results.

Table 3. Model information criteria

Predictor	Outcome	Estimate	Std. error	z-value	p	95% confidence interval	
						Lower	Upper
VIP	SE	**-1.227**	0.035	-35.453	< 0.001	-1.295	-1.159
TDP	SE	-0.328	0.010	-32.307	< 0.001	-0.348	-0.308
VIP	TP	**-0.579**	0.010	-56.045	< 0.001	-0.600	-0.559
TDP	TP	-0.057	0.002	-24.508	< 0.001	-0.061	-0.052

Relationships direct between the latent variables show statistically significant found, so it means there is a causality between independent and dependent variables but there are negatives, the strong relationship between (*VIP*, *SE*), and the weakest relationship between (*TDP*, *TP*). This can be interpreted as the negative consequences of online induction and training on employees compared with the face-to-face methods. The second method is used to improve social interaction which might improve the people's satisfaction and their attitudes toward these factors. Online inductions might not offer the same level of interpersonal engagement as traditional in-person inductions

(Hayman et al., 2022). Workers may have feelings of alienation and disconnection as a result, which could lower their SE. During an online induction, staff members might not get the chance to query trainers or other participants for clarifications (Luft et al., 2003). Confusion and ambiguity may result from this, which may cause them to lose faith in their capacity to do their jobs.

In addition, online inductions frequently involve presenting a large amount of material in a brief period. This could overload staff members and make them feel unqualified to take in and remember everything, which would lower their SE and thus their TP.

Table 4. Factor loadings (Part 1)

Latent	Indicator	Estimate	Std. error	z-value	p	95% confidence interval	
						Lower	Upper
VIP	inp1	1.000	0.000			1.000	1.000
	inp2	1.104	0.013	84.624	< 0.001	1.078	1.129
	inp3	1.120	0.013	86.911	< 0.001	1.095	1.145
	inp4	0.631	0.009	68.027	< 0.001	0.613	0.650
	inp5	0.896	0.012	76.944	< 0.001	0.874	0.919
	inp6	0.950	0.012	76.927	< 0.001	0.926	0.974
	inp7	1.231	0.014	86.479	< 0.001	1.203	1.259
	inp8	1.329	0.015	90.090	< 0.001	1.300	1.358
	inp9	0.733	0.011	66.559	< 0.001	0.711	0.754
	inp10	0.467	0.011	43.906	< 0.001	0.447	0.488
SE	se1	1.000	0.000			1.000	1.000
	se2	1.038	0.007	143.615	< 0.001	1.024	1.052
	se3	1.151	0.008	148.359	< 0.001	1.136	1.166
	se4	0.572	0.007	80.305	< 0.001	0.558	0.586
TDP	tdp1	1.000	0.000			1.000	1.000
	tdp2	1.080	0.006	177.577	< 0.001	1.069	1.092
	tdp3	1.003	0.006	163.983	< 0.001	0.991	1.015
	tdp4	1.080	0.006	176.390	< 0.001	1.068	1.092
	tdp5	0.828	0.006	132.060	< 0.001	0.816	0.840
	tdp6	1.091	0.006	168.311	< 0.001	1.078	1.104
	tdp7	0.672	0.006	106.099	< 0.001	0.660	0.685
	tdp8	1.020	0.006	167.501	< 0.001	1.008	1.032
	tdp9	0.777	0.006	123.460	< 0.001	0.764	0.789
	tdp10	0.850	0.007	130.813	< 0.001	0.838	0.863
	tdp11	1.057	0.006	169.995	< 0.001	1.045	1.069
	tdp12	1.087	0.006	178.606	< 0.001	1.075	1.099
	tdp13	1.031	0.006	165.412	< 0.001	1.018	1.043
	tdp14	0.809	0.006	126.590	< 0.001	0.797	0.822
	tdp15	0.249	0.005	51.998	< 0.001	0.240	0.259
	tdp16	0.183	0.006	30.520	< 0.001	0.172	0.195
TDP	tdp17	0.231	0.006	39.538	< 0.001	0.219	0.242
	tdp18	0.214	0.006	35.453	< 0.001	0.202	0.226
	tdp19	0.199	0.006	33.545	< 0.001	0.188	0.211
	tdp20	0.107	0.005	19.524	< 0.001	0.097	0.118
	tdp21	0.107	0.006	17.154	< 0.001	0.094	0.119

Table 4. Factor loadings (Part 2)

Latent	Indicator	Estimate	Std. error	z-value	p	95% confidence interval	
						Lower	Upper
TP	tp1	1.000	0.000			1.000	1.000
	tp2	1.217	0.015	82.261	< 0.001	1.188	1.246
	tp3	1.074	0.013	83.021	< 0.001	1.048	1.099
	tp4	1.181	0.014	85.096	< 0.001	1.154	1.208
	tp5	1.206	0.016	73.787	< 0.001	1.174	1.238
	tp6	1.413	0.016	89.328	< 0.001	1.382	1.444
	tp7	1.371	0.016	86.033	< 0.001	1.340	1.402
	tp8	1.507	0.017	88.599	< 0.001	1.474	1.540
	tp9	1.109	0.016	69.817	< 0.001	1.078	1.140
	tp10	0.944	0.015	62.332	< 0.001	0.915	0.974
	tp11	1.038	0.016	65.432	< 0.001	1.007	1.069
	tp12	0.914	0.016	57.877	< 0.001	0.883	0.945
	tp13	1.211	0.015	83.446	< 0.001	1.182	1.239
	tp14	1.233	0.015	83.560	< 0.001	1.204	1.261
	tp15	1.343	0.017	79.479	< 0.001	1.310	1.376
	tp16	1.138	0.016	71.043	< 0.001	1.107	1.169

The strong and weakest relationship is positively significant between latent and measurement variables.

5. DISCUSSIONS OF THE RESULTS

The study aimed to explore the impact of VIP and TPD on teachers' SE and their TP due to their importance on educational performance in the education sector. This study used international data to understand how VIP and TPD interacted with teachers' SE and TP.

The analysis shows a significant relationship between the main independent variables (*VIP*, *TPD*) on the dependent variables (*SE*, *TP*). These results are aligned with many studies (Blanchard et al., 2023). It is widely acknowledged that teacher preparation is essential for students to succeed in school, and initiatives such as Erasmus+ offer structures for ongoing professional growth. In order to meet actual training demands, these programs concentrate on enhancing instructional strategies and incorporating digital tools into the classroom (Ponomareva, 2021).

The online induction program and training can determine the level of teachers' SE and TP. Effective TP enhances teacher development (Oyekan, 2018). Teachers may not get prompt feedback on how well they performed or understood the topic during an online induction. This may give them doubts about their development and skills, which could be detrimental to their SE. Overall, teachers' SE may decline as a result of online inductions since they cannot receive the personal attention, constructive criticism, and support they require to feel confident in their skills.

It's possible that online training won't give educators enough chances to practice novel approaches or methods in an actual classroom environment. Because of this, it may be difficult for educators to apply what they have learned in their classrooms. Teachers may find it more difficult to cooperate and form relationships with their colleagues if they receive their training online. This may make it more difficult to exchange best practices and create a welcoming professional community. Technology errors and outages can occur during online training, which can impede student progress and irritate educators. This may result in a deficiency of interest and drive to partake in the instruction. Online training could not include a follow-up and accountability structure to make sure teachers are using what they have learned. As a result, there can be a gap between classroom instruction and practice.

6. CONCLUSION

This study tries to understand how VIP and training affect teachers' SE and their TP. Participant SE and teaching skills improved significantly as a result of interactive training modules, mentorship opportunities, and peer cooperation. These results imply that effective VIPs can be quite helpful in assisting new instructors in overcoming the obstacles of their early careers. It is highly recommended for schools and universities to conduct face-to-face induction programs as well as training. This leads to improved teachers' SE and their TP. Previous studies suggest that although the people thoroughly liked the event, their expectations were based more on what they had learned from attending than on anything they had necessarily experienced before. They liked the opportunity to get to know their peers, put faces to names, and build trust (Hodgkinson, 2002). The policymakers should review the effectiveness of the virtual programs especially when deciding to implement an induction or training program. The findings of this study found that virtual activities might have little impact due to different reasons including the little social interactions and the technology's problem. Implications of a successful virtual orientation program for new hires can boost their general job satisfaction and help them integrate into the company culture. This procedure not only helps individuals feel like they belong, but it also provides them with the resources and tools they need to be successful in their responsibilities. Additionally, it promotes team members' open communication and cooperation, which can boost output and creativity. Additionally, a well-structured virtual orientation can help reduce turnover rates by ensuring that new hires feel valued and supported from day one (Dahling & Lauricella, 2017). Moreover, by incorporating interactive elements such as virtual tours and mentorship programs, organizations can create a more engaging experience that resonates with new employees, making them more likely to stay committed to their roles long-term (Simo et al., 2010).

This commitment to employee engagement not only enhances retention but also cultivates a positive workplace culture that attracts top talent.

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