

The impact of training and professional development on physical education teacher self-efficacy

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Abstract:

Teacher self-efficacy is a key driver of teaching quality and professional growth. Continuous professional development, particularly for physical education (PE) teachers, is critical for enhancing their self-efficacy, enabling them to adapt to modern educational challenges and improve teaching standards. This study investigated the relationship between training, professional development, and self-efficacy among PE teachers. Findings revealed a positive correlation between training, particularly in digital skills development post-pandemic, and PE teacher self-efficacy across diverse aspects of their teaching. Specifically, teachers who participated in training programs reported an 88.9% increase in their self-efficacy, while participation in ICT-related seminars boosted their teaching strategies by 83.3%. Additionally, self-efficacy has been found to have a positive correlation with both classroom management and student engagement. This relationship underscores the critical importance of continuous professional development as a means to enhance teaching practices. When teachers possess a strong sense of self-efficacy, they are more likely to implement effective classroom management strategies and foster an engaging learning environment for their students. The research highlights that systematic peer support and constructive feedback from experienced educators play a pivotal role in empowering teachers. Such collaborative efforts not only facilitate the sharing of innovative classroom practices but also create a culture of continuous improvement among educators. Moreover, the development and implementation of targeted training programs that specifically focus on enhancing the digital skills of physical education (PE) teachers are deemed essential. As the educational landscape increasingly incorporates technology, equipping teachers with the necessary digital competencies is crucial for improving their effectiveness in managing classrooms and actively engaging students in the learning process. These training programs should be designed to address the unique challenges faced by PE teachers, ensuring that they are well-prepared to integrate technology into their teaching methodologies.

Keywords: Professional development, Teaching practices, Collaborative learning, Teacher training, Feedback

Introduction:

Teacher training is a fundamental factor for the continuous development and improvement of teaching quality. In this context, it has been established that teachers who participate in training programs demonstrate improved skills and knowledge, which they apply to their teaching practice (Almazroa & Alotaibi, 2023; Ünlü & Erbaş, 2019; Anacleto et al., 2017; Schipper et al., 2018; Apriyano et al., 2023). Moreover, training contributes to their ongoing professional development, enabling them to meet the ever-changing needs of students and the educational process (Hussain & Khan, 2022; Liu & Liao, 2019; Fernández-Rivas & Espada-Mateos, 2019; Kampmane et al., 2023; Umar et al., 2023). In-service training programs significantly contribute to the professional development of teachers (Alfaidi & Elhassan, 2020; Panda & Mishra, 2022). These programs allow teachers to develop new teaching methods and techniques that enhance the learning process (Curtner-Smith & Fletcher, 2024; García-Rico et al., 2021; Gümüş & Bellibaş, 2021; Adamakis & Rocliffe, 2024). Additionally, they offer opportunities for professional collaboration and the exchange of ideas, which can lead to innovative classroom practices (Fernández-Batanero et al., 2019; Almazroa & Alotaibi, 2023; Nowland, 2023). The importance of digital proficiency in promoting teaching innovation is highlighted in the study by Kampmane et al. (2023).

Teacher self-efficacy is a pivotal construct that significantly influences the quality of teaching and the professional development of educators, particularly in the context of Physical Education (PE). The concept of self-efficacy, as defined by Bandura, refers to an individual's belief in their capabilities to execute behaviors necessary to produce specific performance attainments (Bai et al., 2019; Holzberger et al., 2013). This belief is crucial for teachers, as it directly impacts their instructional practices, classroom management, and interactions with students. A robust body of literature underscores the importance of continuous professional training in

enhancing teachers' self-efficacy, thereby equipping them with the skills and knowledge required to navigate modern educational challenges effectively (Wasserman & Maymon, 2017; Tongchai, 2021; Čotar Konrad & Štemberger, 2023).

Moreover, the role of school leadership in fostering an environment conducive to teacher self-efficacy cannot be overlooked. Principals who exhibit strong self-efficacy are perceived to be more effective instructional leaders, which positively influences teachers' beliefs in their own capabilities (Hallinger et al., 2017). This dynamic creates a supportive school culture where teachers feel empowered to implement new strategies and approaches in their classrooms. The interplay between principal leadership and teacher self-efficacy highlights the necessity for a holistic approach to professional development that includes both teacher training and leadership support (Sehgal et al., 2017). Professional development programs that are tailored to the specific needs of PE teachers have been found to be particularly effective in enhancing self-efficacy. For example, training that incorporates hands-on experiences and collaborative learning opportunities allows teachers to practice new skills in a supportive environment, thereby increasing their confidence (Skaalvik & Skaalvik, 2014; Pan & Cheng, 2023). Such programs not only improve teachers' knowledge and skills but also foster a sense of community among educators, which is essential for sustaining motivation and engagement in the teaching profession (Hivner et al., 2019).

Furthermore, the impact of professional development on self-efficacy is not limited to instructional practices alone. It also extends to teachers' mental health and job satisfaction. Research indicates that teachers who engage in continuous professional training report higher levels of job satisfaction and lower levels of burnout (Gebbie et al., 2011; Gorozidis et al., 2020). This is particularly relevant in the context of PE, where teachers often face unique challenges related to student engagement and physical activity promotion. By enhancing self-efficacy through targeted professional development, PE teachers can better manage these challenges, leading to a more positive teaching experience (Bai et al., 2019; Shaukat et al., 2018).

In addition to formal training, the establishment of teacher learning communities has emerged as a valuable strategy for enhancing self-efficacy. These communities provide a platform for teachers to share experiences, discuss challenges, and collaboratively develop solutions (Pan & Cheng, 2023; Wasserman & Maymon, 2017). The social support garnered from such interactions is crucial for building confidence and reinforcing the belief that teachers can positively impact their students' learning experiences. The collaborative nature of these communities aligns with the principles of social cognitive theory, which posits that observational learning and social interaction are key components of self-efficacy development (Hivner et al., 2019; Popeska et al., 2018). Moreover, the integration of technology in professional development initiatives has shown promise in enhancing teacher self-efficacy. As educational technology becomes increasingly prevalent, training that incorporates digital tools and resources can empower teachers to utilize these technologies effectively in their instruction (Kampman et al., 2023; Karim et al., 2021). This not only enhances their teaching practices but also boosts their confidence in navigating the complexities of modern educational environments.

The relationship between self-efficacy and teacher effectiveness is further supported by empirical evidence demonstrating that trained teachers exhibit higher levels of self-efficacy compared to their untrained counterparts (Korcz et al., 2021; Jassim, 2020). This finding underscores the critical role of professional development in fostering a sense of competence among educators. As teachers acquire new skills and knowledge, their self-efficacy beliefs are reinforced, creating a positive feedback loop that enhances their overall effectiveness in the classroom.

The continuous professional training of PE teachers is essential for enhancing their self-efficacy, which in turn influences the quality of teaching and student outcomes. The interplay between professional development, school leadership, and collaborative learning environments creates a comprehensive framework for supporting teachers in their professional journeys. As educators navigate the complexities of modern education, fostering self-efficacy through targeted training and support will be crucial for ensuring that they can meet the diverse needs of their students and contribute positively to the educational landscape.

Materials and Methods

Participants

The study involved the participation of 346 Physical Education (PE) teachers who work across various educational levels in Greece. The research tools used included questionnaires developed and validated by recognized research instruments. The questionnaires included scales measuring self-efficacy, professional development, and technological literacy.

The self-efficacy scale used was the Teachers' Sense of Efficacy Scale (TSES) by Tschannen-Moran and Woolfolk Hoy (2001), which was adapted for the Greek population by Tsigilis et al. (2010), ensuring its validity and reliability for the Greek context. Correlations between the variables related to the physical education teachers' questionnaire were calculated using Pearson's correlation coefficient r . In contrast, the relationship with the technical literacy variables was calculated using Spearman's coefficient.

This scale consists of 24 questions that examine three key factors: student engagement, teaching strategies, and classroom management.

Procedure

The assessment of teachers' professional development was based on questions developed for the study, focusing on knowledge and skills related to computers, the use of ICT, certification in foreign languages, and participation in seminars and European educational programs. For the reliability and validity of these questions, findings from the literature and guidelines from Javeau (2000) and Anastasiou (2021), who used similar tools in a postgraduate thesis, were utilized.

The scale for technological literacy was based on the same set of questionnaires that examine the knowledge and skills of PE teachers in computer use and general ICT applications developed by the researcher of this study, taking relevant literature into account.

Additionally, respondents were asked to provide demographic information such as gender, age, marital status, educational qualifications, and years of service based on the documentation of the questionnaire structure and analysis process described by Papanastasiou and Papanastasiou (2005).

Data collection and analysis

Data was collected through an electronic platform, with the questionnaires sent to the teachers via email from December 2021 to June of the same year. The participants were selected based on their willingness to participate in the study, and anonymity and confidentiality were ensured to protect the teachers' personal data.

Data analysis was conducted using the statistical package SPSS v.28. Demographic information and employment characteristics of the participants were presented using absolute and relative frequencies (N, %). The reliability of the scales used was tested through Cronbach's alpha coefficient, followed by an analysis of the composite variables derived from these scales.

The normality of the data was assessed using the Shapiro-Wilk test where necessary, and parametric statistical tests such as the independent samples t-test and One-Way ANOVA were applied to test for differences between the demographic and employment characteristics of the teachers. Additionally, correlations between variables were calculated using Pearson's correlation coefficient (r) and Spearman's coefficient, depending on the data parameters. This methodology ensured an accurate and reliable analysis of the data, allowing valid conclusions to be drawn regarding the relationship between training and the self-efficacy of PE teachers.

The invitations for PE teachers to participate were sent via the email addresses of the Primary and Secondary Education Directorates nationwide to the schools where they were employed. In total, 339 fully completed PE teacher questionnaires were received, which were sent out at the beginning of December 2021 and collected by the end of the same month of the same year.

Results

| | | Category | N | % |
|------|--|---|-----|-------|
| I. | Gender | Male | 174 | 50.9% |
| | | Female | 168 | 49.1% |
| II. | Age | Up to 30 | 6 | 1.7% |
| | | 31-35 | 2 | 0.6% |
| | | 36-40 | 13 | 3.8% |
| | | 41-45 | 27 | 7.8% |
| | | 46-50 | 74 | 21.4% |
| | | 51-55 | 138 | 39.9% |
| | | 56-60 | 73 | 21.1% |
| | | 61 and above | 13 | 3.8% |
| III. | Position Held During the Current School Year | Substitute - Secondary Public Education | 9 | 2.7% |
| | | Substitute - Primary Public Education | 21 | 6.2% |
| | | Private Secondary Education | 16 | 4.7% |
| | | Permanent - Secondary Public Education | 101 | 30.0% |
| | | Permanent - Primary Public Education | 158 | 46.9% |
| | | Private Primary Education | 16 | 4.7% |
| | | Private Primary and Secondary Education | 16 | 4.7% |
| IV. | Years of Service in Education | 0-10 | 42 | 12.5% |
| | | 11-20 | 131 | 38.9% |
| | | 21-25 | 85 | 25.2% |
| | | 26-30 | 33 | 9.8% |
| | | 30 and above | 46 | 13.6% |
| V. | Number of Schools Worked During Career | One | 23 | 6.8% |
| | | Two to four | 52 | 15.4% |

| | | | | |
|-------|---|-----------------|-----|-------|
| | | Five to Seven | 66 | 19.6% |
| | | More than Seven | 196 | 58.2% |
| VI. | Number of Regional Education Directorates Worked In | One | 71 | 21.1% |
| | | Two | 105 | 31.2% |
| | | Three | 74 | 22.0% |
| | | More than Three | 87 | 25.8% |
| VII. | Highest Educational Qualification | Basic Degree | 232 | 68.8% |
| | | Master's Degree | 91 | 27.0% |
| | | Doctorate | 14 | 4.2% |
| VIII. | Do you hold a second degree? | Yes | 26 | 7.7% |
| | | No | 311 | 92.3% |
| IX. | Do you hold a Master's degree relevant to education? | Yes | 93 | 27.6% |
| | | No | 244 | 72.4% |
| X. | Years of Experience in Leadership Roles (e.g., Director, Deputy Director, Head of Physical Education, etc.) | None | 226 | 67.1% |
| | | 0-1 | 18 | 5.3% |
| | | 2-3 | 41 | 12.2% |
| | | 4-5 | 20 | 5.9% |
| | | 5 and above | 32 | 9.5% |

Regarding the specific knowledge of Physical Education (PE) teachers, particularly in computer usage, the majority of the sample reported holding an A-level certification (43.1%), 24.3% reported holding a B-level certification, and 28.6% reported having ECDL certification, while 50 participants (14.5%) stated that they do not hold any certification (Table 2).

A total of 63.3% stated that they had attended seminars on internet safety, while 51.7% had attended training on the use of Information and Communication Technologies (ICT) in education (Table 2). Additionally, the majority (60.1%) reported that they do not maintain a personal website or blog, but they do maintain and update the e-class platform (53.2%) and visit the Ministry of Education's digital repositories at a rate of 79.5% (Table 2).

Regarding foreign languages, specifically English, the highest percentage of certification levels is held at the B2 level (First Certificate) (35.3%) and the C2 level (Proficiency) (16.2%), while 28.3% of respondents reported that they do not hold any certification (Table 2). This percentage rises to 69.9% when referring to certification in a second foreign language, with the highest level of certification being C2 at 9.2% (Table 2).

Furthermore, concerning seminar attendance, the majority of respondents reported having attended seminars organized by the Regional Educational Planning Centers (PEKES) at a rate of 65%, seminars organized by the Institute of Educational Policy (IEP) at 50%, and seminars organized by the Physical Education Coordinator and the Head of Physical Education at rates of 93.9% and 85.8%, respectively (Table 2). Additionally, 61.8% reported attending seminars from other institutions or universities, such as the National and Kapodistrian University of Athens (EKPA), while 32.4% reported attending year-long seminars (over 400 hours) from other institutions (Table 2).

Only 20 individuals (5.8%) stated that they had served as coordinators for a European program, while 85 individuals (24.6%) reported having participated in one of these programs (Table 2). Lastly, 59 individuals (17.1%) reported having participated in an educational mobility program (Table 2).

| | | N | % |
|---|-----|-----|-------|
| Certified Computer Knowledge Level A' | No | 197 | 56.9% |
| | Yes | 149 | 43.1% |
| Certified Computer Knowledge Level A'B' | No | 262 | 75.7% |
| | Yes | 84 | 24.3% |
| ECDL | No | 247 | 71.4% |
| | Yes | 99 | 28.6% |
| I do not have certified computer knowledge | No | 296 | 85.5% |
| | Yes | 50 | 14.5% |
| I. Have you attended seminars related to safe internet browsing? | No | 127 | 36.7% |
| | Yes | 219 | 63.3% |
| II. Have you attended training courses related to the use of Information and Communication Technologies (ICT) in education (B1, B2, T4E)? | No | 167 | 48.3% |
| | Yes | 179 | 51.7% |
| III. Do you maintain and update your personal blog or website? | No | 208 | 60.1% |
| | Yes | 138 | 39.9% |
| IV. As a teacher, do you maintain and update an e-class? | No | 162 | 46.8% |
| | Yes | 184 | 53.2% |
| V. Do you visit the digital repositories of the Ministry of Education (e.g., Aisopos, Digital School, Photodentro)? | No | 71 | 20.5% |
| | Yes | 275 | 79.5% |

| | | | | |
|-------|---|------------------------|-----|-------|
| VI. | Certified English knowledge (please indicate the highest certificate) | None | 98 | 28.3% |
| | | B1 (Preliminary) | 24 | 6.9% |
| | | B2 (First Certificate) | 122 | 35.3% |
| | | C1 (Advanced) | 46 | 13.3% |
| | | C2 (Proficiency) | 56 | 16.2% |
| VII. | Certified knowledge of another language (Spanish, German, other language) | None | 242 | 69.9% |
| | | B1 | 29 | 8.4% |
| | | B2 | 30 | 8.7% |
| | | C1 | 13 | 3.8% |
| | | C2 | 32 | 9.2% |
| VIII. | I have attended seminars organized by the Regional Center for Educational Planning (PEKES). | No | 121 | 35.0% |
| | | Yes | 225 | 65.0% |
| IX. | I have attended seminars organized by the Institute of Educational Policy (IEP). | No | 173 | 50.0% |
| | | Yes | 173 | 50.0% |
| X. | I have attended seminars organized by the Physical Education Coordinator. | No | 21 | 6.1% |
| | | Yes | 325 | 93.9% |
| XI. | I have attended seminars organized by the Head of Physical Education. | No | 49 | 14.2% |
| | | Yes | 297 | 85.8% |
| XII. | I have attended seminars by other organizations or universities such as the National and Kapodistrian University of Athens (NKUA), the National Center for Public Administration and Local Government (EKDDA), etc. | No | 132 | 38.2% |
| | | Yes | 214 | 61.8% |
| XIII. | I have attended annual seminars (over 400 hours) by other organizations (e.g., EKDDA, EKPA). | No | 234 | 67.6% |
| | | Yes | 112 | 32.4% |
| XIV. | Have you participated as a coordinator in European programs (Comenius/Erasmus, E-twinning)? | No | 326 | 94.2% |
| | | Yes | 20 | 5.8% |
| XV. | Have you participated as a participant in European programs (Comenius/Erasmus, E-twinning)? | No | 261 | 75.4% |
| | | Yes | 85 | 24.6% |
| XVI. | Have you participated as a participant in European educational mobility programs (Comenius/Erasmus, E-twinning)? | No | 287 | 82.9% |
| | | Yes | 59 | 17.1% |

The result of the dependent samples t-test showed that the perceived digital competencies of PE teachers increased significantly ($p<.001$) after the pandemic to a good level ($M=8.01$, $SD=1.27$) compared to the moderate level recorded for digital skills before the pandemic ($M=6.30$, $SD=1.99$), (Table 3).

| Table 3. Descriptive statistics for the perceived digital competencies of PE teachers before and after the pandemic | | |
|--|------|------|
| | M | SD |
| On a scale of 1 to 10, rate your digital competencies before the pandemic | 6.30 | 1.99 |
| On a scale of 1 to 10, rate your digital competencies after the pandemic | 8.01 | 1.27 |
| Note. Statistically significant increase after the pandemic ($p<.001$) according to the results of the dependent samples t-test. | | |

The reliability indices of the questionnaire were satisfactory (Table 4). The composite variable was used in the analyses as it approaches the threshold of 0.5, which is considered an acceptable value (Field, 2016)

| Table 4. Number of items and Cronbach's alpha reliability indices of the scales and subscales for the sample of teachers | | |
|---|-------|------------------|
| Teachers | Items | Cronbach's alpha |
| Effectiveness in student engagement | 8 | 0,838 |
| Effectiveness in instructional strategies | 8 | 0,853 |
| Effectiveness in classroom management | 8 | 0,812 |
| Teacher effectiveness | 24 | 0,939 |

The Physical Education teachers in the sample seem to have a fairly high perception of their self-efficacy, as shown by the values of the three self-efficacy factors included in the TSES scale: student engagement ($M=6.04$), instructional strategies ($M=6.04$), and classroom management ($M=5.92$), with a minimum score of 1 and a maximum of 7 (Tables 5, 6).

The highest values are observed in the questions "Do you provide an alternative explanation or example when students have difficulty understanding something you taught?" ($M=6.68$, $SD=0.56$) and "Can you enforce the rules you have set for classroom management to ensure the lesson runs smoothly?" ($M=6.40$, $SD=0.7$) (Tables 5, 6).

Table 5. Statistical indicators of the individual components of the TSES scale regarding the perception of self-efficacy of Physical Education teachers

| Individual components of TSES ^a | M | SD |
|---|------|-----|
| Efficacy in student engagement ^a | 6.04 | .57 |
| Efficacy in instructional strategies ^a | 6.04 | .61 |
| Efficacy in classroom management ^a | 5.92 | .61 |

a. . Minimum value =1, Maximum value =7

Table 6. Statistical indicators of the variables of the PE teachers

| | Mean | Std. Deviation | Skewness | Kurtosis |
|--------------------------------------|--------|----------------|----------|----------|
| Efficacy in student engagement | 6.0383 | .56776 | -.384 | -.254 |
| Efficacy in instructional strategies | 6.0426 | .60880 | -.574 | .131 |
| Efficacy in classroom management | 5.9205 | .61415 | -.479 | -.101 |

According to the Spearman correlation coefficients between the variables of technological literacy and the dependent variables for Physical Education teachers, participation in seminars on internet safety was positively correlated with teacher-student proximity ($r=.126$, $p<.05$), emotional intelligence ($r=.155$, $p<.01$), and teacher self-efficacy ($r=.146$, $p<.01$), as well as with the three subscales of self-efficacy concerning student engagement ($r=.119$, $p<.05$), instructional strategies ($r=.137$, $p<.05$), and classroom management ($r=.152$, $p<.01$) (Table 7).

Maintaining a personal blog or website was positively correlated with emotional intelligence ($r=.168$, $p<.01$) and teacher self-efficacy ($r=.143$, $p<.01$), as well as with the three self-efficacy subscales concerning student engagement ($r=.122$, $p<.05$), instructional strategies ($r=.113$, $p<.05$), and classroom management ($r=.167$, $p<.01$) (Table 7).

Maintaining and updating an e-class was positively correlated with emotional intelligence ($r=.142$, $p<.01$) and teacher self-efficacy ($r=.195$, $p<.01$), as well as with the three subscales of self-efficacy concerning student engagement ($r=.183$, $p<.01$), instructional strategies ($r=.192$, $p<.01$), and classroom management ($r=.184$, $p<.01$) (Table 7).

The assessment of digital skills after the pandemic was positively correlated with communication skills ($r=.173$, $p<.01$), teacher-student proximity ($r=.238$, $p<.01$), emotional intelligence ($r=.371$, $p<.01$), the relationship between the teacher and staff ($r=.164$, $p<.01$), and teacher self-efficacy ($r=.424$, $p<.01$) (Table 7). Specifically, there was a positive correlation between the assessment of digital skills after the pandemic and the three subscales of self-efficacy concerning student engagement ($r=.356$, $p<.01$), instructional strategies ($r=.427$, $p<.01$), and classroom management ($r=.419$, $p<.01$) (Table 7).

The assessment of digital skills before the pandemic was positively correlated with emotional intelligence ($r=.148$, $p<.01$), teacher self-efficacy ($r=.226$, $p<.01$), and the three subscales of self-efficacy concerning student engagement ($r=.170$, $p<.01$), instructional strategies ($r=.236$, $p<.01$), and classroom management ($r=.235$, $p<.01$) (Table 7).

Table 7. Spearman correlation coefficients between the variables of technological literacy and self-efficacy

| | Effectiveness (student engagement) | Effectiveness (instructional strategies) | Effectiveness (classroom management) | Teacher effectiveness |
|---|------------------------------------|--|--------------------------------------|-----------------------|
| Certified Computer Knowledge Level A' | -0.019 | -0.039 | -0.066 | -0.049 |
| Certified Computer Knowledge Level B' | -0.040 | 0.019 | -0.004 | -0.004 |
| ECDL | 0.066 | 0.063 | 0.072 | 0.071 |
| I do not have certified computer knowledge | -0.049 | -0.036 | -0.034 | -0.039 |
| Seminars on internet safety | .119* | .137* | .152** | .146** |
| Training on the use of ICT in education | 0.035 | 0.047 | 0.090 | 0.064 |
| Personal blog or website | .122* | .113* | .167** | .143** |
| Maintaining and updating an e-class | .183** | .192** | .184** | .195** |
| Ministry of Education's digital repositories | -0.032 | -0.001 | -0.020 | -0.014 |
| Assessment of digital skills before the pandemic | .170** | .236** | .235** | .226** |

| | | | | |
|--|--------|--------|--------|--------|
| Assessment of digital skills after the pandemic | .356** | .427** | .419** | .424** |
| Certified English knowledge | -0.033 | -0.033 | -0.030 | -0.039 |
| Certified knowledge of another language | 0.082 | 0.086 | 0.084 | 0.092 |
| PEKES seminars | -0.018 | -0.021 | -0.027 | -0.025 |
| IEP seminars | 0.052 | 0.050 | 0.050 | 0.051 |
| Physical Education Coordinator seminars | -0.093 | -0.096 | -0.096 | -0.101 |
| Physical Education Head seminars | 0.004 | -0.007 | -0.004 | 0.000 |
| Other seminars | 0.004 | -0.017 | 0.003 | -0.002 |
| Other seminars (over 400 hours) | 0.088 | 0.061 | 0.102 | 0.091 |
| Coordinator in European programs | 0.003 | 0.011 | 0.048 | 0.019 |
| Participant in European programs | 0.029 | 0.025 | 0.051 | 0.033 |
| Participant in European educational mobility programs | 0.003 | -0.019 | -0.006 | -0.010 |

* $p < .05$, ** $p < .01$

The percentage of male participants was 50.9%, while female participants made up 49.1% (Table 1). The majority of the sample consisted of individuals over the age of 46, with those aged 51 to 55 representing 39.9% and those aged 46 to 50 and 56 to 60 representing close to 21%, respectively (Table 1). The largest proportion of the sample were permanent public employees in primary education (46.9%) and secondary education (30%) (Table 1).

A total of 14.1% worked in private education (evenly split between primary and secondary education), while 8.9% of the teachers were employed as substitute teachers in public education (Table 1). Most teachers reported having between 11 and 20 years of teaching experience (38.9%), followed by those with 21 to 25 years of experience (25.2%). Additionally, 46 respondents (13.6%) reported over 30 years of experience, while 42 respondents reported having between 0 and 10 years of experience (Table 1). Moreover, most respondents (58.2%) indicated that they had worked in more than seven (7) schools during their career, while only 23 respondents (6.7%) stated that they had served in just one school (Table 1). Regarding the number of regional education directorates, most respondents (31.2%) reported serving in two, while 22% reported serving in three, and 21.1% reported serving in only one (Table 1).

Regarding the educational qualifications of the teachers, the majority (68.8%) stated that they held a basic degree, 27% reported having a master's degree, and 14 individuals reported holding a doctoral degree (Table 1). Almost all respondents (92.3%) reported not holding a second degree (Table 1). Most respondents (67.1%) reported having no experience in leadership roles, such as Director, Deputy Director, or Head of Physical Education, while 12.2% reported having 2 to 3 years of experience, and 9.5% reported having more than five years of experience (Table 1).

Discussion

According to the results of this study, it appears that the professional development of Physical Education teachers is critical for their professional growth and the enhancement of their self-efficacy.

Specifically, the immediate impact of professional development on self-efficacy is demonstrated by participation in training programs, as noted by Ünlü and Erbaş (2019). Similar results were observed in the research by Hettinger et al. (2021) as well as Skaalvik and Skaalvik (2019). In this study, comparable outcomes were found, indicating a significant positive effect on teacher self-efficacy. Teachers who participate in well-designed training programs develop increased confidence in their teaching abilities and classroom management skills.

Practical experience and positive feedback from mentors and supervisors are critical for enhancing self-efficacy (Iaochite and Costa Filho, 2020). Similarly, in this study, it was found that teachers who have the opportunity to apply their knowledge in practice and receive positive feedback exhibit higher levels of self-efficacy. Specifically, participation in seminars on internet safety was positively correlated with teacher-student proximity, emotional intelligence, and teacher self-efficacy, as well as with the three self-efficacy subscales concerning student engagement, instructional strategies, and classroom management. These findings align with the conclusions of Klassen and Tze (2014), who emphasize that positive feedback and guidance contribute to increasing teachers' self-efficacy. Additionally, Wyatt's (2018) study highlights the importance of practical experience and support from experienced mentors in improving teaching self-efficacy.

The development of digital skills has a significant impact on teachers' self-efficacy (Garzón Artacho et al., 2020). Similar results were found in this study, confirming that teachers who develop digital skills and

incorporate technologies into their teaching show increased confidence and the ability to implement innovative teaching methods. A positive correlation was found between the assessment of digital skills after the pandemic and communication skills, teacher-student proximity, emotional intelligence, and teacher self-efficacy. Furthermore, Lindqvist and Pettersson (2019) showed that teachers who develop digital skills have increased self-efficacy and are more likely to actively engage students through digital tools. Scherer and Teo's (2019) study also points out that teachers' digital skills are closely linked to their ability to create dynamic and innovative learning environments, thus boosting their confidence in their teaching abilities.

Continuous professional development is essential for maintaining and enhancing self-efficacy. According to this study, teachers who participated in repeated training and educational seminars, such as those organized by the Regional Center for Educational Planning (PEKES) and the Institute of Educational Policy (IEP), exhibited increased levels of self-efficacy, particularly in student engagement and instructional strategies. These findings underscore the importance of continuous professional development in improving teaching and classroom management. Turan, Pepe, and Bahadir (2015) also showed that teachers who participate in regular training programs and continuous professional development activities display higher levels of self-efficacy and professional satisfaction. Opfer and Pedder (2011) emphasize that participation in ongoing training programs contributes to the cultivation of self-efficacy, which is essential for teachers' professional success. Additionally, Kennedy (2016) notes that professional learning communities, which are part of continuous professional development, are closely linked to increasing self-efficacy and teaching effectiveness.

Professional learning communities and collaborative learning play a significant role in teacher professional development. Darling-Hammond et al. (2017) and Kennedy (2016) emphasize that teachers who participate in such communities show increased commitment and motivation for continuous improvement, exchanging experiences and knowledge with colleagues. Similar results were found in this study, as teachers who participated in seminars organized by the Physical Education Coordinator and the Head of Physical Education reported increased self-efficacy and effectiveness in classroom management, as well as improved teaching strategies, indicating the importance of collaboration and knowledge sharing within professional learning communities. The research of Vescio, Ross, and Adams (2008) supports that professional learning communities enhance teachers' commitment and self-efficacy through collaboration and knowledge exchange. Wang, Liu, and Tong's (2023) research similarly support that participation in evolving online professional learning communities strengthens teachers' self-efficacy and improves their teaching practices.

It is crucial to highlight the importance of aligning professional development activities with the actual needs of teachers. Developing programs that meet the needs and interests of teachers ensures practical and applicable training (Timperley et al., 2007). The results of this study confirm that training and continuous professional development are essential for enhancing the self-efficacy of Physical Education teachers. Practical experience, positive feedback, digital skills development, and collaborative learning are key elements for successful training. Teachers who participate in such activities show increased confidence and the ability to implement effective teaching methods, thereby improving the learning experience for their students. Specifically, teachers who attended training related to the use of Information and Communication Technologies (ICT) in education reported significant improvements in their teaching practices, while the alignment of training with their needs was positively correlated with their self-efficacy. Darling-Hammond, Hyler, and Gardner (2017) confirm that aligning professional development with teachers' needs is crucial for improving teaching and the learning experience. Borko, Jacobs, and Koellner (2010) support that personalized training activities that meet teachers' specific needs improve their effectiveness in the classroom. Cordingley et al. (2015) emphasize that teachers who participate in training aligned with their practical needs show significant improvements in teaching and self-efficacy.

Conclusions

The findings of this study confirm the importance of continuous professional development and training for Physical Education teachers (PE teachers) as a key factor in enhancing their self-efficacy. The results indicate that training is not merely a process of acquiring new knowledge but a multidimensional experience that boosts teachers' confidence and equips them with the necessary tools to meet the challenges of modern educational practice. The positive impact of developing digital skills on their professional practice, especially after the pandemic, is highlighted. The increase in digital skills not only improved the quality of teaching but also enhanced student engagement, the use of innovative instructional strategies, and classroom management. This suggests that integrating Information and Communication Technologies (ICT) into the educational process is not just a trend but a necessary condition for promoting effective teaching and preparing students for the future.

The significance of collaborative learning and feedback from colleagues and experts in the field of Physical Education is underscored. Interaction with other educators through professional learning communities and participation in structured training programs proved critical for the development of self-efficacy.

The research also demonstrates that teachers' self-efficacy is directly linked to classroom management and student engagement. Teachers who feel capable of meeting the demands of teaching and adjusting their strategies to the needs of their students achieve better results in both student performance and educational quality.

The findings of this study emphasize the importance of systematically evaluating training programs to adapt them to the real needs of teachers. This evaluation helps identify the strengths and weaknesses of the programs and ensures that training activities are practical and applicable. Especially in the case of Physical Education, where teachers face unique challenges, tailored training that responds to their specific needs is crucial for their success.

The investigation of the self-efficacy of Physical Education teachers is fundamental, as it provides valuable data for the development of targeted training programs. According to the findings of this study, the relevant services of the Ministry of Education and the Physical Education Directorates could administratively support practices that foster self-efficacy by providing systematic feedback and organizing training programs with an emphasis on digital skills and classroom management.

It is recommended to conduct further research with a larger sample of Physical Education teachers to enhance the generalizability of the findings. Additionally, it is important to study the self-efficacy of PE teachers working in special education schools, where the demands are different. Further investigation into additional dimensions, such as the relationship between self-efficacy and psychosocial factors, is also suggested to better understand the needs and challenges faced by educators.

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