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Fostering Physically Active Language Learning (PALL) Proficiency Among In-Service Language Teachers in Türkiye: A Mix-Method Exploration

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Abstract

Teacher training initiatives for Physically Active Learning (PAL) are notably scarce, particularly within the realm of English Language Education and within the contexts of developing countries. This research delineates a comprehensive training program specifically tailored for English as a Foreign Language (EFL) instructors in Türkiye, aiming to foster Physically Active Language Learning (PALL). The study engaged thirty in-service EFL teachers from diverse state schools in the training initiative. In this study, a mixed methods design was employed, involving the collection and integration of both qualitative and quantitative data. This approach allowed for a comprehensive examination of the changes observed in teachers' motivation for recreational exercise, playfulness, physical activity efficacy, and attitudes toward sports. Specifically, the research design included surveys to gather quantitative data and semi-structured interviews for qualitative insights. The data collection methods encompassed standardized questionnaires and in-depth interviews, which were analyzed using statistical methods and thematic analysis, respectively. These factors are crucial in influencing teachers' willingness to adopt, implement, and promote physical activity learning (PAL). The results demonstrated significant improvements in teachers' mastery motives and increased interest in sports. Additionally, the study provides valuable insights into the potential long-term impact of the training program on teaching practices and student outcomes, shedding light on the sustainability and effectiveness of integrating PALL into educational settings. Overall, teacher feedback indicated overwhelmingly positive perceptions of the PALL training program.

Keywords

physically active language learning, teacher training, in-service English teachers, motivation, attitudes

Introduction

The proliferation of technological advancements, such as online learning, remote work, individualized transportation, and automated household devices, has significantly increased sedentary lifestyles. This trend particularly affects children, whose recreational activities have shifted from traditional outdoor play to prolonged screen time and digital games, thereby exacerbating physical inactivity. Statistics indicate that only a quarter of children in the United States meet the daily recommendation of 60 min of physical activity (Michel et al., 2022). Similarly, in Türkiye, the Turkish Statistical Institute (TUIK, 2021) reports a rise in internet usage among children aged 6 to 15, from 50.8% in 2013 to 82.7% in 2021.

The link between cognitive processes and physical activity underscores the threat that rising physical inactivity poses to children's cognitive functioning and academic performance (Dakin & Chung, 2011; Hands et al., 2011). Teachers play a crucial role in this dynamic, as their attitudes and behaviors toward physical activity can significantly influence their students' activity levels.

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Thus, equipping teachers with the skills and motivation to integrate physical activity into their teaching practices is imperative. This aligns with the World Health Organization's (2016) recommendations for promoting physical activity in educational settings. Consequently, this study aims to train EFL teachers in Physically Active Language Learning (PALL), enhancing both physical activity and cognitive outcomes for teachers and students.

Recognizing the importance of physical activity in the learning process, various global initiatives have aimed to increase students' activity during instructional periods across subjects like mathematics, geography, history, and science (Mavilidi et al., 2016; Vetter et al., 2018). Significant efforts have also been made in foreign language learning, particularly in vocabulary acquisition among young children (Duncan et al., 2017; Schmidt et al., 2019).

Despite these efforts, the extent to which educators are prepared to facilitate Physically Active Learning (PAL) opportunities remains uncertain. Teachers are often not trained to incorporate physical activity into their teaching, leading to feelings of inadequacy and a perceived lack of creativity (S. K. Schmidt et al., 2022). Barriers to PAL implementation include teachers' motivation levels, perceived competence in physical activity, and attitudes toward integrating physical activity into the classroom. Therefore, there is a critical need for targeted training to support teachers in effectively implementing PAL.

While teacher training in PAL is essential, such initiatives are scarce, particularly in the context of language learning and teaching. The existing literature lacks examples of teacher training programs specifically designed for PALL, posing a challenge to its successful integration in classrooms. Most studies on PAL and related teacher training have been conducted in developed countries, such as Norway, Denmark, Ireland, Canada, and the USA (McMullen et al., 2014; Resaland et al., 2016; Watson et al., 2017). This focus overlooks the unique challenges of implementing PAL in other regions, limiting the generalizability of findings. There is a significant gap in knowledge regarding PAL initiatives in developing countries and non-Western contexts, highlighting the need for research in diverse educational settings (UNESCO, 2015).

In Türkiye, for example, professional development opportunities for educators are limited, and there have been no significant efforts to introduce or train language teachers in PALL methodologies. Addressing this gap is crucial for enhancing pedagogical practices and promoting active learning strategies in Türkiye and similar contexts.

This study aims to support in-service English language teachers in creating Physically Active Learning (PAL) experiences for their students. We developed and implemented a comprehensive PALL teacher training program with 30 EFL teachers in Türkiye. The study focused on changes in teachers' recreational exercise motivation, playfulness, physical activity efficacy, and attitudes toward sports before and after the training. These personal factors are essential in shaping teachers' willingness to adopt and advocate for PAL methodologies (Quarmby et al., 2019; S. K. Schmidt et al., 2022). Additionally, we explored teachers' perceptions of the training program's efficacy and impact.

By extending the scope of PAL research to developing countries, this study contributes valuable insights into PALL teacher training. Our findings aim to enhance the practical implementation and ongoing research in the field of PALL, enriching the existing body of knowledge and supporting the global integration of active learning strategies.

Physically Active Learning (PAL)

Physically Active Learning (PAL) is an educational approach that integrates physical activity into traditional academic instruction to enhance student engagement and learning outcomes. This method leverages the cognitive and physical benefits of movement, promoting active participation and retention of material. Studies have shown that incorporating physical activities into the learning process can improve students' concentration, memory, and overall academic performance (Donnelly & Lambourne, 2011; Howie & Pate, 2012). PAL strategies may include activities such as kinesthetic learning tasks, movement-based games, and active breaks, which have been demonstrated to foster a more dynamic and interactive classroom environment (Mahar et al., 2006; Wijnsma, 2017). Additionally, PAL aligns with the broader educational goals of developing holistic learners who are physically and cognitively active, supporting the assertion that active learning environments contribute positively to student well-being and academic success (M. Schmidt et al., 2016).

Schools wield considerable influence over the inactivity levels and sedentary behavior observed in contemporary children. This impact stems from the extensive duration of desk-based activities, spanning approximately 8 hr each day, coupled with the prevalence of passive instructional delivery techniques (Wiggins et al., 2017). Paradoxically, while schools contribute to sedentary behaviors, they concurrently possess the potential to serve as catalysts for enhanced physical activity among students. This potential can be realized through the adoption of teaching approaches aligned with Physically Active Learning (PAL), as emphasized by scholars such as Bacon and Lord (2021), Daly-Smith et al. (2018), and

Donnelly (2009). Physically Active Learning (PAL) is characterized by the integration of physical activity within academic settings, extending beyond the confines of traditional physical education classes. This definition underscores the incorporation of movement and physical engagement into various academic disciplines, including but not limited to science or mathematics, as articulated by Watson et al. (2017). In addition to the physical benefits, PAL is cognitively beneficial for children as it is associated with more efficient brain activity patterns and reduces stress and anxiety as well as psychological as it reduces stress and anxiety (Biddle & Asare, 2011; Harvey et al., 2018; Tomporowski et al., 2008; Van Dusen et al., 2011; Waters et al., 2014).

Considering the health benefits of PAL as well as its wider benefits on academic outcomes and emotional well-being, many programs have been developed to prevent students from being physically passive in the classroom, especially in Western countries such as Norway, Denmark, Ireland, Canada, and the USA (S. K. Schmidt et al., 2022). Mavilidi et al. (2016), for example, implemented PAL in a preschool geography course in which children learned the names of six continents and a typical animal from each continent using a floor-mounted world map with soft toy animals. Children were randomly assigned to one of the following three conditions: an integrated physical activity condition, an unintegrated physical activity condition, and a control condition without physical activity. According to the results, both physically active learning conditions led to higher performance than the physically inactive learning condition on both the immediate retention test and the delayed retention test administered 5 weeks later. In addition, those children in the physical activity conditions (integrated and non-integrated) demonstrated the highest level of enjoyment. In another implementation, Vetter et al. (2018) compared two approaches to the learning of an important numeracy skill of times tables: the physical activity approach, in which students concurrently were engaged in aerobics and a seated classroom approach. The physical activity group exercised for 20 min three times a week for 6 weeks while simultaneously learning the timetables skill whereas the classroom group received similar instructions while seated. The results showed students in both groups improved their skill similarly in both conditions; however, improvement in general numeracy was significantly greater in the physical activity group than in the classroom group.

More recent studies have focused on why teachers adopt or do not adopt PAL through qualitative research designs. Using surveys and interviews, Knudsen, Skovgaard, et al. (2021) explored the motivation of 206 teachers and teaching assistants working in 14 schools in Denmark to integrate PA into their teaching practices. They found that the autonomous reasons of teachers and teaching assistants for integrating PAL were "linked to the importance of addressing PA in schools, as well as positive student outcomes and enjoyment" (p. 7). Some controlled motivation was due to time pressure as a barrier since they found fitting PAL into the curriculum challenging in terms of the required time, planning, and resources. In another study, Lerum et al. (2021) explored why teachers ($n = 13$) in Norwegian lower secondary schools adopted PAL through interviews. They found that overall teachers adopted PAL because of its following contributions to learning: "variation, improved concentration, motivation and engagement, and interactions and collaboration between both pupils and teacher" (p. 5). The researchers categorized the teachers into three based on their persona The Conforming Teacher who just followed school policy, The Innovating Teacher who wanted to be seen as an innovative educator, and The Connecting Teacher who valued PA and learning-by-doing. Lomsdal et al. (2022) examined the perceptions of teachers ($n = 12$) working in one secondary school in Norway regarding the barriers related to implementing PAL in the classroom by interviewing them three times over 8 months: before, under, and after a PA intervention study. The researchers identified four main barriers related to teachers' implementation of PAL: (a) time, (b) perception of own competence, (c) uncertainty of academic outcome, and (d) inability of PA to fit within the instruction of the academic subject.

Physically Active Language Learning (PALL)

The importance of physical activity interventions has also been recognized in foreign language teaching in the last decade, especially in teaching vocabulary, reading, and spelling. Several studies have shown promising results for physically active vocabulary learning (e.g., Mavilidi et al., 2015; Padial-Ruz et al., 2019; Parks et al., 2007). Duncan et al. (2017), for example, examined the effect of a 6-week combined movement and story-telling intervention on naming vocabulary in preschool children. Children in three preschool classes were assigned to either a combined movement and story-telling group, a movement-only group, or a story-telling-only group. The results displayed significantly greater improvement in language ability pre- to post-intervention for the combined movement and story-telling group in comparison to the movement-only or story-telling-only groups.

In Schmidt et al.'s (2019) study, children were assigned to one of the following three learning conditions to learn 20 foreign language words in a 2-week teaching program with four learning sessions: (a) an embodied learning condition with task-relevant physical activities, (b) a physical activity condition with task-irrelevant physical

activities, and (c) a control condition with a sedentary teaching style. They found that both the embodied learning condition and the physical activity condition were more effective in learning foreign language vocabulary than the control condition. In another study, Mavilidi et al. (2020) examined the impact of Thinking while Moving in English (TWM-E) intervention on primary school students' academic outcomes for 6 weeks during which teachers delivered three 40-min physically active English lessons per week in comparison with a control group who learned through with the usual lessons. According to the baseline and post-test results, significant effects were observed for the learning of grammar and punctuation in the TWM-E group, but no effects on spelling. While existing studies generally suggest positive findings regarding the effects of PAL on vocabulary learning, research findings are mixed and inconsistent in terms of its effect on improving reading skills. A few studies have reported significant effects on reading improvement (e.g., Resaland et al., 2018); however, a higher number of studies have reported no significant effects (e.g., Fedewa et al., 2015; Reed et al., 2010; Szabo-Reed et al., 2019) (see Martin-Martinez et al., 2023 for a systematic review of studies on physical activity interventions and language skills).

Teacher Training in PAL

In its "Global Action Plan on Physical Activity 2018–2030: More Active People for a Healthier World" (World Health Organization, 2018) one of the recommendations of the World Health Organization is to "strengthen formal preservice and in-service training for preschool, primary and secondary school teaching staff, and administrators to strengthen knowledge and teaching skills on the value of active play, physical education, adaptive physical activity, fundamental movement skills, and physical literacy" (p. 67). Teachers are the key agents and fundamental facilitators in implementing classroom-based PAL, and PAL relies on teachers' acceptance and willingness to transform their teaching practices towards PAL (Beets et al., 2008; Knudsen, Skovgaard, et al., 2021).

Despite the key role of teachers in implementing PAL, teacher training efforts in PAL are scarce. In one attempt, McMullen et al. (2016) trained 13 primary school teachers in Ireland to implement PAL in their classrooms through a movement integration program they called Moving to Learn Ireland. Teachers participated in two training workshops, each lasting 45 to 60 min: "an introductory workshop where they were introduced to the resource, participated in some of the movement lessons and were given the opportunity to ask questions about the resource and any of the lessons; and a follow-up workshop that allowed them to discuss their progress with the lessons, introduced them to some additional activities and included time for questions and answers about the lessons and the resource" (p. 323). The researchers examined the teachers' perceptions through pre- and post-questionnaires, structured lesson reflections, focus group interviews, and field notes, and identified the reasons why they were willing to include movement in their classes, the barriers to movement integration, and their suggestions for movement integration in classes. The main reasons were the benefits to the children such as improved motivation and concentration, and student enjoyment. The main barriers were related to time and space, such as meeting curricular goals, classroom set-up, and class size. The main suggestions included movement lessons that required little or no pre-prepared equipment, a simple and easy-to-implement predetermined program and resources to follow, and professional development opportunities.

Very recently, Mulhearn et al. (2023) conducted an intervention study with eight secondary school teachers from different academic content areas (English, Math, Science, Spanish, and Special Education). Teachers participated in eight monthly 60-min professional development workshops where strategies for integrating PAL into the high school classroom were modeled, practiced, and discussed. Each teacher received the Fitness for Life Wellness Coordinator textbook and a handout with ideas for using equipment for different content areas. The researchers examined students' and teachers' thoughts through interviews with teachers and students and field notes. They found that both teachers and students welcomed movement-based instruction. Students reported feeling better and it lasted for the rest of the day. The only challenge noted by the teachers was that PAL took thought and time.

While the literature includes a few examples of teacher training attempts, PAL is a new topic in the field of English language education in Türkiye, where the physical inactivity of students is also a big problem. In order to increase English language teachers' awareness and to equip them with the necessary knowledge and skills to implement PALL, it is necessary to create training opportunities for them. In this study, we report on such an attempt. We specifically examine the changes in EFL teachers' recreational exercise motivation, playfulness, physical activity efficacy, and attitudes toward sports. To this end, we seek answers to the following questions:

1. To what extent does the PALL teacher training program affect in-service English language teachers' recreational exercise motivation, playfulness, physical activity efficacy, and attitudes toward sports?

2. What are the perceptions of in-service English language teachers regarding the PALL teacher training program?

Methods

Research Design

In this study, we employed a mixed-method approach with an explanatory design (Creswell et al., 2003) to comprehensively investigate the research problem. The quantitative aspect utilized a single-group design, specifically a one-group pretest-posttest design, to measure the impact of the intervention on participants before and after its implementation. This design allowed for the assessment of changes within the same group over time. For the qualitative aspect, a case study design was used to gain an in-depth understanding of participants' experiences and perceptions related to the intervention. By combining these methods, the study aimed to provide a holistic view of the phenomena, integrating statistical data with rich, contextual insights from individual cases. The effects of the PALL teacher training program on teachers' perceived physical activity skills, motivation, playfulness, and attitudes toward sports were examined using a single-group pre-test and post-test design. In our study, the case represented the group of participants in the training program.

Participants

Participants of this study were English language teachers working in governmental schools from various provinces of Türkiye. Since this study was carried out as a TUBITAK (The Scientific and Technological Research Council of Türkiye) project, participants were chosen based on the following specific selection criteria: to have been working as an English language teacher at least for a year; to not have been involved in a similar TUBITAK project before; and to not have any health problems. Out of a total of 115 volunteers, 30 English language teachers from 30 different schools (11 male and 19 female) meeting the selection criteria were chosen as the participants of the study. Given that project applications were accepted online, the initiative successfully garnered participation from a wide array of geographical regions across Turkey. The selection process was designed to ensure a diverse representation from various regions of the country, spanning from the eastern to the western regions and from the northern to the southern regions. Specifically, participants were recruited from Uşak in the west, Van in the east, Çorum and Samsun in the north, and Mersin and Antalya in the south. Furthermore, individuals from Gaziantep and Diyarbakır in the Southeastern Anatolia Region were also included. This strategic approach was intended to enhance both the demographic and regional representativeness of the project. The demographic characteristics of the participants and their levels of participation in recreational sports activities are presented in Table 1.

Around half of the participants were at the age of 30 ($N = 16$, 53%) while the rest were 31 to 40 ($N = 10$, 33%) or 41 to 50 years old ($N = 4$, 13%). The majority of the participants had undergraduate degrees ($N = 26$, 87%) while a few also had graduate degrees ($N = 4$, 13%). Regarding their professional experience, 10 of the participants (33%) had been working for 0 to 5 years, 13 (43%) for 6 to 10 years, 6 (20%) for 11 to 15 years, and 1 (3%) for 16 to 20 years.

Participants reported participating in the following recreational activities: walking ($n = 15$, 50%), football ($n = 4$, 13%), pilates ($n = 2$, 7%), swimming ($n = 2$, 7%), yoga, 2 (6.7%), weightlifting ($n = 2$, 7%), volleyball ($n = 1$, 3%), tennis ($n = 1$, 3%), fitness ($n = 1$, 3%), and cycling ($n = 1$, 3%). Regarding the frequency of participating in recreational activities, 4 (13%) of the participants reported participating for less than 1 hr a day, 6 (20%) for 1 to 3 hr a day, 16 (53%) for 1 to 3 days a week, 1 (3%) for 4 to 6 days a week, 2 (7%) for 1 to 3 days a month, and 1 (3%) for 4 to 6 days a month.

Data Collection Tools

To answer the research questions, data were collected from five different tools: Recreational Exercise Motivation Measure, Playfulness Scale, Physical Activity Efficacy Scale, Sports-Oriented Attitude Scale, and a perception questionnaire. Because there is no available scale that directly measures PAL-related motivation, efficacy, or attitudes, following a similar methodology to existing studies on PAL (e.g., Knudsen, Skovgaard, et al., 2021; Sesen & Tarhan, 2010), we used scales on exercise motivation, playfulness, physical activity efficacy, and attitudes toward sports. Such personal factors are believed to affect teachers' willingness to adopt, implement, and promote PAL (S. K. Schmidt et al., 2022). Two of the scales were originally developed in Turkish, and the two other scales were adapted to Turkish. To avoid any possible different interpretations of the English scales, all scales were implemented in Turkish.

Recreational Exercise Motivation Measure (REMM). REMM was developed by Rogers and Morris (2003) to measure the motives of adults participating in physical activities. The original measure consists of 73 items categorized into eight factors (motives), each with 8–13 items: mastery, enjoyment, psychological condition, physical condition, appearance, others' expectations, affiliation, and

Table 1. Demographic Characteristics and Sport Participation Levels of the Participants.

Category	Groups	Frequency (*n*)	Percent (%)
Sex	Male	11	36.7
	Female	19	63.3
Age	20–30	16	53.3
	31–40	10	33.3
	41–50	4	13.3
Work experience	0–5 years	10	33.3
	6–10 years	13	43.3
	11–15 years	6	20.0
	16–20 years	1	3.3
Marital status	Single	18	60.0
	Married	12	40.0
Recreational sports activities	Walking	15	50.0
	Football	4	13.3
	Volleyball	1	3.3
	Tennis	1	3.3
	Fitness	1	3.3
	Yoga	1	3.3
	Pilates	2	6.7
	Weight lifting	2	6.7
	Cycling	1	3.3
	Swimming	2	6.7
Participation frequency	<1 hr/day	4	13.3
	1–3 hr/day	6	20.0
	1–3 days/week	16	53.3
	4–6 days/week	1	3.3
	1–3 days/month	2	6.7
	4–6 days/month	1	3.3
Years of participation	0–5 years	19	63.3
	6–10 years	3	10.0
	11–15 years	7	23.3
	16–20 years	1	3.3
Licensed sports activity	Yes	3	10.0
	No	27	90.0

competition/ego. Each item is introduced with the stem *I do recreational exercise to/because…*, and is measured on a 5-point Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), with higher scores reflecting stronger motives for participating in recreational exercise. The Cronbach's Alpha in the original REMM was found to be high for each factor: .88 for mastery, .88 for enjoyment, .85 for psychological condition, .80 for physical condition, .83 for appearance, .77 for others' expectation, .90 for affiliation, and .92 for competition/ego.

A Turkish version of REMM has been created and validated by Gürbüz et al. (2006). Because the internal consistency of some factors was found to be low, Gürbüz et al. (2006) reduced the number of items to 66 and combined some factors together: Mastery (8 items), Enjoyment (11 items), Condition (22 items), Appearance (11 items), and Competition/ego (14 items). The mastery factor included items such as *To get better at an activity*, *To improve existing skills*, or *To obtain new skills/activities*. The enjoyment factor included items such as *Because it is interesting*, *Because it makes me happy*, or *To do activities with others*. The condition factor included items such as *To better cope with stress*, *Because it helps maintain a healthy body*, or *Because it helps me relax*. The appearance factor included items such as *To improve appearance* or *To lose weight, look better*. The competition/ego factor included items such as *To be best in the group*, *To compete with others around me*, or *Because I get paid to do it*.

In our study, the overall reliability of REMM was found to be high with a Cronbach's Alpha level of .91. The Cronbach's Alpha of each factor was found as the following: .91 for mastery, .90 for enjoyment, .86 for condition, .91 for appearance, and .90 for competition/ego.

Playfulness Scale. The playfulness scale was developed by Hazar (2014) in Turkish to measure the attitudes of university students toward playing games including physical activity. It is a 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) containing two factors (i.e., the affective factor and the behavioral factor) and 23 items in total. Some sample items from the

scale are as follows: *I like playing games*, *I get excited when I learn a new game*, *I don't realize if I get tired while playing*, and *I want to play games even if I am sick*. Hazar (2014) found the reliability of the scale to be strong, with a Cronbach's alpha of .85 (.83 for the affective factor and .61 for the behavioral factor). In our study, we also found the overall reliability of the playfulness scale to be high (alpha = .85, .86 for the affective factor and .85 for the behavioral factor).

Physical Activity Efficacy Scale (PAES). PAES is a domain-specific physical activity scale developed by Campbell et al. (2016) to predict physical activity behavior in adolescents. It specifically measures how confident individuals are in participating in a variety of physical activities at increasing intensity levels (light, moderate, and/or vigorous) and increasing periods of time (in minutes). It is an 11-point Likert scale ranging from 0% (Not confident at all) to 50% (Kind of confident) and 100% (Completely confident). High scores indicate a high level of physical activity efficacy. The scale consists of 5 domains with a total of 26 items: School physical activity (6 items), Transport physical activity (3 items), Household physical activity (5 items), Leisure and recreation physical activity (6 items), and Ambulatory school and transportation physical activity (6 items). Campbell et al. (2016) reported the internal consistency for each of the five domain efficacy factors as the following: School physical activity efficacy alpha = .93, Transport physical activity efficacy alpha = .90, Household physical activity efficacy alpha = .95, Leisure and recreation physical activity efficacy alpha = .95, and Ambulatory school and transportation physical activity efficacy alpha = .91. Some sample items from the scale are as the following:

> School physical activity: At school, you may be enrolled in physical education classes and/or engage in before/after school activities (band, soccer, volleyball, etc.). These activities can vary in intensity but are usually moderate to vigorous. How confident are you that you can complete 30 MINUTES of physical education and/or school activities at a MODERATE INTENSITY level EVERY DAY of the school week?
>
> Transport physical activity: Sometimes you may bike or jog at a moderate intensity, as a means of transportation, in order to get to or from a specific place. How confident are you that you can complete 30 MINUTES of biking and/or jogging at a MODERATE INTENSITY level on FIVE OR MORE days of the week?

A Turkish version of the scale has been created and validated by Saygın et al. (2017). They reported the internal consistency for each of the five domain efficacy factors as the following: School physical activity efficacy alpha = .94, Transport physical activity efficacy alpha = .65, Household physical activity efficacy alpha = .96, Leisure and recreation physical activity efficacy alpha = .95, and Ambulatory school and transportation physical activity efficacy alpha = .95. In our study, we found the reliability of the factors as the following: School physical activity efficacy alpha = .91, Transport physical activity efficacy alpha = .92, Household physical activity efficacy alpha = .94, Leisure and recreation physical activity efficacy alpha = .93, and Ambulatory school and transportation physical activity efficacy alpha = .91.

Sport-Oriented Attitude Scale (S-OAS). S-OAS was developed by Sentürk (2015) in Turkish to determine the attitudes of individuals towards sports. The scale consists of three factors with a total of 25 items: giving importance to sports (13 items), being interested in sports (6 items), and doing physical exercises or sports (6 items). Some sample items from the scale are as follows: *I believe that sports have physical, physiological, and psychological benefits* or *I encourage my friends to do sports* (Giving importance to sports); *I always wanted to be in the school teams* or *I am willing to participate in sports activities without any force* (Being interested in sports); and *I spend my summer days doing sports* or *I take exercises at home when I do not go out* (Doing physical exercises or sports).

Sentürk (2015) found the overall reliability of the scale to be strong, with a Cronbach's alpha of .97: .97 for giving importance to sports, .98 for being interested in sports, and .95 for doing physical exercises or sports. In our study, we found the overall reliability of the scale to be .90 with the following reliability levels for each factor: .89 for giving importance to sports, .89 for being interested in sports, and .90 for doing physical exercises or sports.

Perception Questionnaire. To determine English language teachers' perceptions regarding the PALL teacher training program, a short perception questionnaire with one close-ended question and three open-ended questions was used. The following questions were included in the questionnaire:

1- What does "PALP: Physically Active Learning Portfolio" mean to you? What is it? How would you define it?
2- Do you think "PALP: Physically Active Learning Portfolio" has met your expectations?
3- In what ways "PALP: Physically Active Learning Portfolio" has contributed to your professional development as an English language teacher?
4- What aspects of the PALP activities did you not like?

Table 2. Content and Structure of the PALP Program.

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Program flow	Aerobics	Rhythmic and arithmetic exercises	Gymnastics	Conditioning exercises	Core training exercises	Different branches of sports
Session 1	Introduction of the exercises					
Session 2	Practical demonstration of the exercises					
Session 3	Sample PALL group activity implementing the target exercise					
Session 4	Sample PALL group activity implementing the target exercise					
Session 5	Classroom management strategies in PALL & first aid training					
Session 6	Developing new PALL activities in groups implementing the target exercise					
Session 7	Evaluating the training activities					

Data Collection and Analysis

After ethical approval was granted from the Research and Ethics Committee of the Faculty of Education at the university where the first author worked, participant recruitment started online. Announcements for the call for participants were shared on social media accounts and on the project website, which is inactive now. Applications were received online using a Google form.

To train in-service English language teachers for PALL, a training program called "Physically Active Learning Portfolio—PALP" was developed. The training program was implemented face-to-face in six days, each day focusing on a different type of exercise: aerobics, rhythmic and arrhythmic exercises, gymnastics, conditioning exercises, core training exercises, and different branches of sports (e.g., badminton, table tennis, etc.). The training program consisted of seven sessions and two parts: theoretical and applied. In the theoretical parts, specific types of exercises were introduced, information on how to start physical activities was given, and the benefits of physical activities for human health were presented by experts in the field of physical education. Strategies were also shared for how to transform classroom environments in a way that is suitable for PAL and for how to overcome potential disruptions such as classroom management problems. In the practical parts, two sample PALL activities were implemented for each exercise type by English language teachers, who were experts in their fields. Then, the participant teachers developed new PALL activities implementing the target exercise type in groups, and each group demonstrated the newly developed PALL activity to the whole class. Each day was completed with evaluation activities. The content and structure of the PALP program are shown in Table 2.

All the scales were implemented on the first day prior to the beginning of the training program. The same scales were re-implemented on the last day of the training program after the last group activity was completed. Participants completed the perception questionnaire online after completing the training program. The quantitative data obtained from the scales were analyzed using SPSS 22.0. Descriptive statistics were calculated through means and standard deviations. The differences in the participants' recreational exercise motivation, playfulness, physical activity efficacy, and sports-oriented attitudes before and after the training program were calculated using a paired-group t-test. The Kurtosis (Leptokurtosis) and Skewness (Asymmetry) values were examined to determine whether the variables exhibited a normal distribution or not. Because the data indicated a normal distribution with kurtosis and skewness values between $+1.5$ to -1.5 and $+2.0$ to -2.0 (George & Mallery, 2010), paired samples t-tests were used to analyze the changes in the participant teachers' motivation, playfulness, physical activity efficacy, and sports-oriented attitudes after the training program.

The qualitative data were analyzed through thematic analysis. Participants' written responses to the perception questions were first individually coded, which were then categorized into the themes that were related to the perception questions. All the coded data were reviewed by the second author to confirm the themes. Cases of disagreement were discussed until consensus. Final changes to the codes were then made to finalize the coding process.

Results

In-Service English Language Teachers' Recreational Exercise Motivation, Playfulness, Physical Activity Efficacy, and Sports-Oriented Attitudes Before and After the PALP Teacher Training Program

Table 3 presents the statistical findings for the recreational exercise motivation measure (REMM) before and after the PALP teacher training program. The findings demonstrate differences in the means of the factors pre- and post-training. The means were observed to be higher in the post-training measurement for the factors of Mastery, Condition, and Appearance while they were

Table 3. Findings for the Recreational Exercise Motivation.

Factor	No. of items	Pre-training		Post-training		t	p
		M	*SD*	*M*	*SD*		
Mastery	8	3.583	0.844	3.963	0.707	−2.052	.049
Enjoyment	11	3.315	1.048	2.921	0.837	1.759	.089
Condition	22	3.942	0.825	4.265	0.719	−1.614	.117
Appearance	11	3.321	0.828	3.530	0.737	−1.011	.320
Competition/ego	14	1.933	1.150	1.786	0.635	0.584	.564

Table 4. Findings for Playfulness.

Factor	No. of items	Pre-training		Post-training		t	p
		M	*SD*	*M*	*SD*		
Affective	11	3.650	0.540	3.577	0.0666	0.491	.813
Behavioral	12	2.791	0.528	2.914	0.647	−0.739	.466

Table 5. Findings for Physical Activity Efficacy.

Domains	No. of items	Pre-training		Post-training		t	p
		M	*SD*	*M*	*SD*		
School	6	5.578	2.398	6.728	2.399	−1.883	.070
Transport	3	7.578	2.267	7.867	1.856	−0.565	.577
Household	5	8.527	1.445	8.693	1.183	−0.485	.631
Leisure and recreation	6	6.428	1.942	7.144	1.962	−1.666	.106
Ambulatory school and transportation	6	8.983	1.119	8.667	1.361	0.839	.408

lower for the factors of Enjoyment and Competition/Ego. However, according to the results of the t-test analysis, only the difference in the Mastery factor was statistically significant ($t = -2.052$; $p = .049$; $d = 0.375$; $\eta^2 = .127$). The increases in Condition and Appearance and the decreases in Enjoyment and Competition/Ego were not significant. The robustness of these findings, particularly the significant change in the Mastery factor, needs to be considered cautiously. It is possible that the sample size or unaccounted variables may have influenced these results, and further research with a larger sample size could provide more definitive conclusions.

Table 4 presents the statistical findings for the teachers' playfulness before and after the PALP teacher training program. The findings demonstrate differences in the means of the affective and behavioral factors: a decrease in the affective factor after the training and an increase in the behavioral factor. However, according to the t-test results, neither the affective factor difference nor the behavioral factor difference was statistically significant. These non-significant changes suggest that the training program might not have effectively impacted the playfulness domain, indicating a potential area for improvement in future program iterations to better address these specific aspects of teachers' behaviors or attitudes.

Table 5 presents the statistical findings for the teachers' physical activity efficacy before and after the PALP teacher training program for the five domains of School, Transport, Household, Leisure and recreation, and Ambulatory school and transportation. Higher means were observed in all domains after the training program except the Ambulatory school and transportation domain; however, none of the differences were statistically significant according to the t-test results. This raises questions about the program's effectiveness in enhancing physical activity efficacy across these domains. A more focused approach might be required to significantly impact teachers' physical activity efficacy.

Table 6 presents the statistical findings for the teachers' attitudes towards sports before and after the PALP teacher training program for three factors: giving

Table 6. Findings for Attitudes Towards Sports.

Factors	No. of items	Pre-training		Post-training			
		M	*SD*	*M*	*SD*	*t*	*p*
Importance	13	3.560	0.639	3.703	0.627	−0.910	.370
Interest	6	3.307	0.835	3.727	0.704	−2.330	.027
Physical activity	6	3.500	0.628	3.630	0.769	−0.738	.467

importance to sports, being interested in sports, and doing physical exercises or sports. In all factors, the teacher participants demonstrated higher means after the training program. However, only in the level of their interest in sports was the increase found to be statistically significant ($p < .05$). The significant increase in interest towards sports suggests some positive impact of the program, though other areas did not show significant changes, indicating room for further development and enhancement of the program.

In-Service English Language Teachers' Perceptions of the PALL Teacher Training Program

The qualitative analysis of teachers' responses to the question "What does 'PALP: Physically Active Learning Portfolio' mean to you? What is it? How would you define it?" revealed a strong emphasis on integrating movement into English teaching to enhance the learning process. The primary themes identified include the fusion of learning with physical activity ($n = 7$), promoting effective and lasting learning ($n = 5$), providing an enjoyable and healthy teaching method ($n = 5$), utilizing active teaching strategies ($n = 4$), maintaining both mental and physical activity ($n = 4$), recognizing the critical role of movement in education ($n = 3$), and introducing a novel teaching approach ($n = 2$). The following quotes from the teachers illustrate the identified themes:

> To make learning fun, effective, and permanent with physical activities. It is to make students ready to learn both mentally and physically. (İ.O.)
> It is a type of activity that will help learning to take place both physically and mentally and adapt mobile learning activities for course gains. (Ş.B.)
> Combining active physical activities with methods and techniques in English teaching, transforming students' attitudes towards English through physical activities. (T.N.K.)
> The fusion of learning with movement. The rate of remembering what people do and say and experience is more than just the teacher's understanding of the lesson. Therefore, permanent learning takes place through action. (N.K.)
> Learning aside the monotony in the learning environment and teaching with active activities. (H.G.)
> It expresses a style that should be in education and training environments. A new perspective, liberation from traditionalism. (Y.A.)

Teachers expressed mostly positive perceptions regarding whether the program met their expectations or not. More than half of the teachers ($n = 19$) reported that it definitely met their expectations while five teachers believed that it met their expectations to a good extent. For five participants, the program met their expectations at a sufficient level, and only one participant thought that their expectations were not met.

Teachers' responses to the question in what ways the training program has contributed to their professional development as English language teacher support their responses above regarding what the program meant for them. Some participants mentioned learning different activity ideas ($n = 6$), new techniques ($n = 3$), how to add movement to the learning process ($n = 6$), how to use students' energies in favor of learning ($n = 4$), and how to make the lesson more fun and learning long-lasting ($n = 1$). Some other teachers mentioned their broadened perspective ($n = 5$) and increased awareness about the importance and necessity of movement for the mind and body ($n = 5$). The below quotes exemplify teachers' perspectives:

> I gained a perspective of producing activities on every subject. (A.A.)
> I got very different ideas. Although I always use music and games in lessons, I did not use this much movement. I am sure that when I use these movements, the energy of the children will not be wasted, and they will provide language learning more easily with the movements they do. (H.Ö.)
> In education, not only mental but also physical development and, in fact, healthy consciousness and body development are important. In this sense, in both respects, this project was a developer. It is also of great importance at the point of raising awareness. (M.G.)
> Professionally, I learned new things from both my colleagues and instructors. This project contributed to me in many ways with teaching methods and techniques, detailed information about the human body, and lots of hands-on activities. (M.Ş.)

> After the moves were introduced, we saw how we could combine it with training. I started looking at the movement to see how I could adapt it to learning. (M.N.A)

The feedback from teachers regarding aspects of the program they did not like highlights critical areas for improvement, specifically in timing, guidance, and expertise. For instance, one teacher noted that "the activities were very intense and progressed quickly," suggesting a need for more time to discuss activities in detail (B.C.). Another teacher pointed out a disparity in content coverage, stating, "When I consider the sports and movement side, it completely meets it. When I deal with the subject of Foreign Language, it is not fully covered," and recommended including foreign educators as experts in future projects (Ş.B.). Concerns about expertise were also evident, with some teachers feeling that certain activities were not led by experts in the field and that the content was at an undergraduate level, whereas more advanced practices were needed (S.B.). Lastly, a teacher mentioned that trainers should have provided more direct guidance rather than asking for suggestions, which could have helped better utilize the learned movements (M.Ş.). These comments underscore the importance of refining these areas to enhance the program's effectiveness and better meet participants' needs.

Discussion

The primary objective of this study was to provide assistance to in-service English language teachers in designing physically active learning experiences for their students. In pursuit of this goal, a Physically Active Language Learning (PALL) teacher training program was devised and executed with the participation of 30 English as a Foreign Language (EFL) teachers operating at various levels of education in Türkiye. We specifically aimed to explore how the PALL training program affected the participating teachers' recreational exercise motivation, playfulness, physical activity efficacy, and attitudes toward sports as well as how they perceived the training program. Our findings showed significant changes in the teachers' mastery motive and level of interest in sports. There were no significant changes in their playfulness and physical activity efficacy. In general, the teachers had very positive perceptions of the PALL training program; however, there were also a few aspects that were negatively perceived by some teachers.

According to the findings of the recreational exercise motivation measure, the teachers' mastery motives were significantly higher after the PALL training program. Referring to the items of this factor in the scale, this means that they felt more motivated to do recreational exercises to improve their skills or obtain new skills or activities. Moreover, teachers demonstrated a significantly higher level of interest in sports after completing the training program. These findings are positive as the literature on PAL highlights the role of teacher motivation and personal experiences in school-based implementations of PAL and the success of learning outcomes (e.g., Cothran et al., 2010; S. K. Schmidt et al., 2022). We anticipate and hope that language teachers who are more motivated to do recreational exercise and who are more interested in sports will be more willing to adopt, implement, and promote PALL.

The PALL teacher training program did not produce statistically significant changes in the playfulness and physical activity efficacy of English as a Foreign Language (EFL) teachers. This result is consistent with the understanding that shifts in attitudes and behaviors often require time to develop and are not immediately evident following professional development interventions. According to Lerum et al. (2021), the integration of newly acquired knowledge and skills into daily practice is a gradual process, and the observable effects on teachers' attitudes and behaviors may only become apparent over an extended period. Furthermore, Guskey (2002) emphasizes that significant changes in educational practices often occur after teachers have had sufficient time to assimilate and apply new strategies in their classrooms. Desimone (2009) also supports this view, noting that professional development impacts are typically mediated by the degree of implementation and the contextual factors within the educational environment. Therefore, while the immediate impact may appear negligible, the potential for long-term positive outcomes remains substantial, contingent upon the sustained application of the training in practical teaching contexts. Future studies should consider longitudinal approaches to capture the delayed effects of professional development programs on teachers' attitudes and efficacy more accurately (Desimone, 2009; Guskey, 2002; Lerum et al., 2021).

It is noteworthy that the physical activity efficacy scale encompassed five domains: School, Transport, Household, Leisure and Recreation, and Ambulatory School and Transportation. The teachers, having not returned to these domains at the conclusion of the training program, naturally exhibited no alterations in their anticipated physical activity within these areas post-training. It is emphasized that administering the scale a few weeks subsequent to teachers re-engaging in these domains would have provided more meaningful insights into the sustained effects of the training program.

In general, the EFL teachers positively perceived the PALL training program. This is in line with findings from existing PAL training studies (e.g., Derri et al, 2015; McMullen et al., 2016; Mulhearn et al., 2023). The

research-based design of our PALL teacher training program might have positively contributed to the teachers' perceptions. For example, several studies found that teachers do not have the skills to integrate physical activity into subject-specific content while ensuring that students move and learn at the same time (e.g., Cothran et al., 2010, Larsen et al., 2012). Knudsen, Bredahl, et al. (2021) refer to this "moving while learning subject matter" as "meaningful" classroom-based physical activity, which they found to be the most dominant factor associated with teachers' sustained use of PAL. In our training program, physical activity was not integrated into teaching in the form of physical activity breaks within the content teaching process, but it was a part of the content teaching process. Moreover, the literature suggests providing training that also offers opportunities for practice during training so that teachers' PAL use can be observed (Mulhearn et al., 2023; Parks et al., 2007; S. K. Schmidt et al., 2022). In our training program, teachers practiced creating new PAL activities based on the daily exercise in groups. Thus, hands-on experience was an important feature of our PALL training program. The positive perceptions of the EFL teachers with regard to the training program are encouraging to continue such professional development efforts.

Among the few aspects of the PALL training program that the teachers negatively perceived were the timing, guidance, and expertise issues. Several studies in the literature have identified time as one of the barriers to implementing PAL (e.g., Larsen et al., 2012; McMullen et al., 2016; Mulhearn et al., 2023; Routen et al., 2018; S. K. Schmidt et al., 2022; Teslo et al., 2023). Our teacher participants did not mention time as a constraint to PAL implementation, which is because they worked in groups when creating new PALL activities and because they demonstrated their PALL activities in front of the whole group rather than implementing them with students in real instructional settings. However, a few teachers expressed that they needed more time to discuss the PALL activities in detail and more guidance when developing new PALL activities. This supports the "complexity of PAL teaching" (S. K. Schmidt et al., 2022, p. 5). Because PAL is an interdisciplinary area, the team of our training program included experts from both physical education and English language education. While the physical education experts introduced and demonstrated the types of exercises and gave instructions on safety and classroom management, the language education experts presented sample PALL activities and guided teachers' development of new PALL activities and class demonstrations. It appears that the participant teachers needed to see more involvement of experts from their own field. Maybe it was necessary to better explain why the team was interdisciplinary and what the role of the physical education experts was. This is an important lesson for future training programs.

While PAL has emerged as a result of health-related concerns, particularly the sedentary classroom time in children, the teachers' perceptions of it were more focused on student learning than student health. When responding to the question of what the PALL teacher training program meant for them, a few teachers mentioned that it was a healthy way to teach and learn that kept the body active along with the mind. However, more teachers referred to combining learning with moving and the effects of moving on learning: effective, permanent, enjoyable, active, etc. A similar finding was observed by Teslo et al. (2023) who argued that "teachers' sensemaking of PAL is driven by their professional identity and practice" (p. 8). Similar to their study, the primary role of PAL for the English language teachers in our study was also facilitating student learning while the potential health benefits seemed to have a secondary role.

Conclusion

Physically Active Learning (PAL) is an emerging area in Turkish English language education, with in-service teachers showing a positive inclination towards incorporating movement into their instructional practices. This integration is crucial for fostering student engagement through physical activity. While the motivation for Physically Active Language Learning (PALL) implementation currently rests at the individual level, comprehensive school-wide initiatives and policies involving administrators and collaborative teachers are necessary for sustained student physical activity.

This study adds to the limited literature on PALL teacher training by evaluating its impact on English language teachers' recreational exercise motivation, playfulness, physical activity efficacy, attitudes toward sports, and perceptions of the training program. However, the lack of follow-up data on changes in classroom teaching practices leaves the application of acquired knowledge in their pedagogical environments unknown. Future research should extend beyond the training context to include evaluations of teachers' instructional environments to fully understand the PALL program's impact (Cothran et al., 2010; S. K. Schmidt et al., 2022).

The duration and content of our teacher training program were appropriate, but sustained support for teachers in PALL is imperative. While in-service training is crucial, optimal training may begin at the undergraduate level within university teacher education programs, particularly in courses like Teaching English to Young Learners in Türkiye (Mulhearn et al., 2023). Introducing PALL to teachers should emphasize educational benefits

such as enhanced enjoyment and active learning, aligning with a learning-oriented perspective rather than health concerns (Teslo et al., 2023).

Limitations, Challenges, and Future Directions

Limitations

This study, while contributing to the limited literature on Physically Active Language Learning (PALL) teacher training, has several limitations. First, the scope was restricted to evaluating the impact of the training program on English language teachers' recreational exercise motivation, playfulness, physical activity efficacy, attitudes toward sports, and their perceptions of the program. However, the lack of follow-up data to assess changes in teachers' classroom teaching practices means that the long-term application of acquired knowledge remains unknown. On the other hand, the single-group design or one-group pretest-posttest design is commonly used when it is not feasible or ethical to have a control group, but it has limitations in terms of internal validity, as it does not control for potential confounding variables. Additionally, the study's sample size and the duration of the training program may limit the generalizability of the findings.

Challenges

Several challenges were identified during the implementation of the PALL training program. One significant challenge is the variability in teachers' prior experience and comfort with integrating physical activity into their teaching practices. Some teachers may be resistant to adopting new methodologies due to a lack of familiarity or perceived relevance to their teaching context. Another challenge is the need for more comprehensive and ongoing support for teachers post-training to ensure sustained implementation of PALL strategies. This support could include follow-up workshops, peer mentoring, and resources that address the specific needs and contexts of teachers.

Future Directions

Future research should focus on longitudinal studies to monitor the long-term effects of PALL training on both teaching practices and student outcomes, thereby providing a more comprehensive understanding of its impact. Expanding the sample size and including a diverse range of participants will improve the generalizability of the findings. Implementing comprehensive support systems, such as follow-up workshops and peer mentoring, is crucial for the continued application of PALL strategies. Introducing PALL concepts into pre-service teacher education programs, especially within courses like Teaching English to Young Learners, will better equip future educators. Emphasizing the pedagogical benefits of PALL over health-related justifications will align more closely with teachers' professional objectives. Furthermore, conducting in-depth qualitative analyses of teachers' experiences and motivations will yield deeper insights, informing the development of more effective training programs.

By addressing these limitations and challenges, and pursuing these future directions, the field of Physically Active Language Learning can continue to evolve and improve, ultimately enhancing both teaching and learning outcomes in English language education.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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