



1ST INTERNATIONAL CONFERENCE26

Spectrum of Teaching Styles:
Improving Education - Together

Improving Education Together

Celebrating 60 Years
of the Spectrum of
Teaching Styles

Ancient Olympia, Greece, 6-9 May 2026



1st International Conference for the Spectrum of Teaching Styles
Ancient Olympia, Greece, May 6-9, 2026

Improving Education Together

Celebrating 60 Years of the Spectrum of Teaching Styles

Conference Proceedings

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Opening ceremony

WELCOME ADDRESS

1st International Conference on the Spectrum of Teaching Styles

Ancient Olympia, Greece

Distinguished guests, honored educators, passionate researchers, dear friends and colleagues, and all who have made the journey to be here today —

Welcome. A very warm and deeply heartfelt welcome to the 1st International Conference on the Spectrum of Teaching Styles.

Welcome to Greece, welcome to Ancient Olympia.

Before anything else, I want you to pause for a moment and think about what is around us. We are here, in this extraordinary corner of the world — a place where thousands of years ago human beings gathered not to compete in war but to celebrate what unites them. Athletes from rival city-states set down their weapons and came together in the spirit of shared humanity. The Olympic Truce — the Ekecheiria — was declared so that the pursuit of excellence could take place in peace.

Today, in the very same spirit, we have gathered from different countries, different universities, different schools of thought — and we are here to pursue a different kind of excellence: the excellence of teaching, the betterment of education.

Why Here. Why Now

Some of you may have wondered why we chose this place, of all places, to hold our first conference. Ancient Olympia is not a convenient location. It is not a large city. It does not have the infrastructure of Athens or Thessaloniki. And yet — I would argue, it is the only place that makes sense for the purposes of this conference.

Actually, we already had at least two international seminars or gatherings in the last 20 years; Once in Chalkidiki, Greece, in 2007 and one in Laramie, during the AIESEP congress in 2016 celebrating 50 years for the Spectrum.

Sara Ashworth wanted to have this gathering much earlier somewhere in the world. However, mainly for reasons outside her will, she did not proceed. I am sure she would be happy to see that we continue to work in service of the mission of the Institute. In addition, I have to say that I am grateful to Sandy Lankler, Sara's last husband, who shared her vision on the dissemination of this theory and provided us with the necessary resources to proceed, plan, and imagine.

What we are talking about this week is not merely a technical matter. It is not a conference about lesson plans, standardized tests, or curriculum frameworks — though all of these things may come up. What we are really here to talk about is something far more ancient and far more human: the relationship between teaching and learning. The relationship between a person who knows and a person who is learning.

That relationship is as old as the ground beneath our feet. Socrates walked through the agora of Athens asking questions he already knew the answers to, not because he was testing

his students, but because he understood that the mind opens through dialogue — not through lecture alone. Aristotle taught while walking, believing that movement and thought belong together. Plato wrote in dialogues because he believed that truth is not transmitted; it is discovered — between people, in conversation.

We carry forward that legacy and tradition. And we have come back to its source.

A few words about the logo of the Conference

The logo of the conference, inspired by an olive wreath, and the logo of the Institute, has many different but strong meanings, a symbol of peace, wisdom, prosperity, eternity and not only. The olive tree and its branches are globally recognized symbols of peace, friendship, longevity, wisdom, prosperity, purification, and resilience, stemming from the tree's ability to thrive in poor soil and its centuries-long lifespan.

In ancient Olympia, the “kotinos” was the only prize awarded to the winners, representing glory, honor, and excellence. The olive branch is the most well-known symbol of peace, dating back to Greek mythology (Athena's gift to Athens) and the story of Noah's Ark, representing the end of conflict. As a gift from Athena, the goddess of wisdom, the olive represents good judgement and reason.

Olive trees can live for thousands of years and are known for their ability to survive in harsh conditions, symbolizing endurance and toughness. Olive oil has been historically used in religious ceremonies for purification and medicinal purposes, symbolizing cleansing and divine grace. The evergreen nature of the tree symbolizes eternal life, rebirth, and hope. The olive branch is often used as a token of goodwill and connection between people.

So, there is so much meaning in a simple wreath...

The Spectrum — and Why It Matters

The title of our conference —Improving education – together - was chosen with great care. And that little word – together - was inspired by the Olympic movement and the known motto Citius, Altius, Fortius, and the little word added the last couple of years by IOC President Thomas Bach: Communis - Together.

Because a spectrum is not a hierarchy. It is not a ranking system. It does not say that one color is better than another, or that one end is superior to the other. A spectrum is a continuum of possibilities, each with its own wavelength, its own frequency, and its own beauty. And when you combine them — when the full spectrum of light comes together — you get white light. You get clarity. You get the ability to see.

We believe that the same is true for teaching. There is no single correct way to teach. There is no one style that works for every student, in every context, in every culture. Each teaching style has its own power. Each has its place. Each illuminates something that others might miss.

The teacher who commands a room with confidence and clarity is doing something valuable. The teacher who steps back and lets students struggle productively toward discovery is doing something equally valuable. The mentor who sits beside a student and listens — truly listens — is doing something irreplaceable.

The problem has never been that there are too many teaching styles. The problem is when we forget that the full spectrum exists — when people become convinced that their way is the

only way. That is, when education fails. That is, when educators cannot communicate their thoughts appropriately. That is, when understanding between educators fails.

This conference is an act of resistance against that narrowness. It is a celebration of breadth and openness.

We are very grateful to Mosston and Ashworth for providing us with a vivid and widely adopted pedagogical framework that is truly catholic in scope.

To the People in This Room

I would like to speak directly now to the educators among us — to the teachers, the professors, the trainers, the tutors. To those of you who spend your days in classrooms and lecture halls, in workshops and seminar rooms, in school courtyards and online platforms.

You probably already know that you have chosen one of the most demanding and important professions in the world. You don't hear that enough.

You carry the weight of other people's futures in your hands — not just their academic futures but also their confidence, their curiosity, and their sense of what is possible for them. A single teacher, in a single moment, can change the entire trajectory of a life. I know many of you have experienced this — as teachers and as students who were once transformed by someone who believed in you before you believed in yourself. Consider me as one of these examples.

I want to honor that today. I want this conference to be, among other things, a gift to you — an opportunity to be seen, to be heard, to exchange ideas with peers who understand the complexity of what you do.

Good teaching does not exist in a vacuum. It requires systems that support it, research that informs it, and policies that make it possible. Theory without practice is sterile. But practice without theory can drift. Practice without a solid pedagogical framework can take you anywhere and perhaps in unwanted places. We are stronger when we talk to each other and rely on a pedagogical framework like the Spectrum of teaching styles.

What Lies Ahead

Over the next two days, within an intensive schedule, you will hear keynote addresses from some of the most brilliant minds in education today. You will share your research ideas and work with people you already know and people you have not seen before. You will participate in sessions that challenge your assumptions and expand your toolkit. You will sit at round tables where questions are discussed openly and where academic freedom of speech or disagreement is welcomed as a sign of intellectual honesty.

You will have time to enjoy the Tai-chi sessions in the early morning that our Taiwanese colleagues have prepared. Although time is precious, you will also have time — I hope — to walk. To sit in the shade of a tree and talk with a colleague from a country you have not met before. To watch the sun set over the Hill of Kronos and feel, perhaps, that small but powerful sense of being part of something larger than yourself.

The little social program and the guided visit to the museum and archaeological site that we have arranged is not a luxury. It is part of the conference. Because the most important conversations often do not happen in auditoriums. They happen when you walk on a beautiful

day. They happen over coffee. They happen when you turn to the person next to you and say: I never thought of it that way before.

Please be open to those moments. Seek them out. Be the person who introduces himself to a stranger. Be the person who asks the question that sounds too simple. Be the person who admits that you do not have the answer — and mean it.

A Final Word

The ancient Greeks had a word — paideia. It is usually translated as 'education', but it means something richer than that. Paideia was the full cultivation of a human being — intellectual, moral, physical, and aesthetic. It was the process by which a person became not just knowledgeable, but wise. Not just skilled but good.

That is what teaching has always been at its best. Not the transfer of information. The formation of a person. We live in an age that has become very good at measuring what students know and much less skilled at asking who they are becoming. This conference, I hope, will help us hold both questions at once.

On behalf of the entire Board of Directors of the Spectrum Institute for Teaching and Learning, important people devoted to the mission of our non-profit organization, the organizing and scientific committee, I would like to express our deepest gratitude to everyone who made this event possible — the Institute, my colleagues from the University of Thessaly, the International Olympic Academy who have helped and welcomed us so graciously, and each of you who submitted a paper, oral or poster, or simply bought a ticket and got on a plane.

You are why this exists.

Welcome to Olympia. Welcome to the beginning of something. May these days be rich in ideas, in connection, in courage — and may you return home with at least one thought that changes the way you stand in front of your students.

The games are open. Let's begin.

Sincerely,

Nikolaos Digelidis,
Professor, SITL President & CEO
Congress Director

Through Sport, We Can Change the World: From Olympic Values to the Spectrum of Teaching Styles

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While the Olympic Movement has traditionally emphasized the core values of “excellence”, “friendship”, and “respect”, contemporary global challenges necessitate the integration of additional values, including “peace”, “social inclusion”, “gender equality”, “environmental protection”, and the “promotion of physical activity”. This perspective is supported by data derived from the literature, a transnational cohort of Olympic education stakeholders, educators, youth ambassadors, and institutional representatives. The findings indicate strong endorsement of an expanded Olympic values framework, with peace emerging as the highest-ranked value, followed by respect and friendship. These values should be systematically cultivated through educational programs, including Olympic education initiatives and broader educational practices. There is a need for a more coherent and critically oriented approach to Olympic values education. Such an approach should encompass curriculum reform, strengthened teacher education, and pedagogical strategies that move beyond symbolic representation toward sustained engagement with gender, ethical, social, and environmental issues. The Spectrum of Teaching Styles aligns closely with the principles and philosophy underpinning Olympic values and can effectively highlight the power, visibility, and universality of the Olympic Movement, as well as the breadth of its value framework. The integrated construct formed by sport, the Olympic Games, physical education, and associated teaching styles can operate within educational settings as a vehicle for promoting the universality of Olympic values. In conclusion, a contemporary Olympic values framework can make a meaningful contribution to education, social cohesion, and sustainable development when supported by coherent pedagogical practices and aligned with the spirit of the motto “Improving Education – Together.”

Session 1 – Oral Presentations: Foundations and Evolution of the Spectrum of Teaching Styles

Chair/Discussant: Nikolaos Digelidis

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| • <i>The Evolution of the Spectrum of Teaching Styles and the Potential of the Theory</i>
Digelidis, N. |
| • <i>The Spectrum of Teaching Styles in Physical Education. A Systematic Review</i>
Álvarez-Rodríguez, E. & Calero-Cano, J.C. |
| • <i>Tracing Transformation: Two Decades of the Spectrum of Teaching</i>
Kim, J. & Nam, K. |
| • <i>Mapping the Belief–Practice Gap in the Spectrum Teaching Styles: Perspectives
from Chinese Physical Education Teachers</i>
Liu, D., Kulinna, P.H., Kim, J., & Min, H. |

The Evolution of the Spectrum of Teaching Styles and the Potential of the Theory

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This presentation offers a critical historical review of Mosston and Ashworth's Spectrum of Teaching Styles, tracing its evolution from its origins to its current form and examining its theoretical potential and limitations.

The Spectrum was first introduced by Muska Mosston in 1966, emerging from fundamental questions about whether a universal, scientific theory of teaching could exist. The inaugural edition proposed seven teaching styles, ranging from command-based to problem-solving approaches. Over subsequent decades, the theory was refined through multiple editions co-authored with Sara Ashworth. By the 3rd edition (1986), the Spectrum had expanded to ten styles, and from the 4th edition (1994) onward it stabilized at eleven — from Style A (Command) to Style K (Self-Teaching) — organized along a continuum of decision-making authority shifting progressively from teacher to learner across three instructional phases: pre-impact, impact, and post-impact.

The presentation then raises critical taxonomic questions, proposed by Digelidis (2006), regarding the internal consistency of the eleven-style framework. A systematic analysis of decision-making combinations across the three phases reveals that the existing styles cover only 7 of 27 possible cases — or as few as 7 of 64 cases if shared decision-making is modeled as a leader-follower dynamic. This exposes significant gaps in the theory's classificatory completeness.

The Spectrum of teaching styles is a pedagogical framework, perhaps incomplete or imperfect, but still powerful with a great potential to guide us in the future of education. Substantial opportunities exist for future research — within individual styles, across styles, and across the Spectrum as a whole — to further develop and refine the theory.

Keywords: spectrum of teaching styles, decision-making, continuum, teaching taxonomy, pedagogical evolution

The Spectrum of Teaching Styles in Physical Education. A Systematic Review

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This study presents a systematic review of the scientific literature from 2015 to 2025 focused on the *Spectrum of Teaching Styles*, developed by Mosston and Ashworth. The Spectrum organizes teaching approaches along a continuum of decision-making responsibility shared between the teacher and the student, dividing styles into reproductive cluster (in which the teacher has more responsibility in decision-making) and productive cluster (in which the students have more responsibility in decision-making) categories. Widely recognized for its versatility and conceptual clarity, the Spectrum continues to be used in diverse educational settings worldwide. This research aims to critically assess its current relevance, practical implementation, and impact on teaching and learning processes in Physical Education.

Following the PRISMA guidelines, a comprehensive literature search was conducted using Web of Science and Scopus databases, employing the PICO framework to guide inclusion criteria. A total of 38 peer-reviewed articles were selected based on language, publication date, thematic alignment, and methodological accuracy. The review highlights that reproductive styles remain the most commonly used in practice, particularly in contexts where structure and control are prioritized. However, numerous studies reveal that productive styles significantly enhance key educational outcomes, including student motivation, autonomy, motor skill acquisition, creativity, and overall engagement. The Spectrum's integration with active methodologies—such as Project-Based Learning, flipped classrooms, and digital technologies like Virtual Reality—further amplifies its pedagogical value.

The findings confirm that the Spectrum, as designed by Mosston and Ashworth, is not only theoretically sound but also practically effective when adapted to diverse educational environments. Its implementation encourages more reflective, inclusive, and student-centered instruction, aligning with contemporary curricular goals in Physical Education. Moreover, the review underscores the need for more comprehensive training of pre-service and in-service teachers in the application of the Spectrum, fostering greater methodological diversity and pedagogical intentionality. This work contributes to both academic knowledge and professional practice, reaffirming the relevance of the Spectrum as a foundational framework for teaching and learning in the 21st-century Physical Education classroom.

Keywords: spectrum of teaching styles, decision-based teaching, reproductive cluster, physical education

Tracing Transformation: Two Decades of the Spectrum of Teaching

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The Spectrum of Teaching Styles categorizes instructional approaches from teacher-directed *Reproduction* to student-centered *Production* clusters. Since 2005, international educational agendas have consolidated around competency-based, learner-centered pedagogy. This 20-year timeframe encompasses nearly two complete student cohorts and corresponds to induction-to-mid-career developmental stages for teachers, creating an optimal window for examining sustained pedagogical shifts. During this period, the *Production* cluster approaches emphasizing student agency and problem-solving have gained salience, while *Reproduction* cluster methods have maintained their foundational role. These global educational transformations raise important questions about whether Physical Education (PE) teachers' beliefs and classroom practices have undergone parallel evolution.

This study examined changes in PE teachers' beliefs about and utilization of teaching styles between 2005 and 2025, using a cross-sectional, comparative research design. The 2005 dataset ($n = 225$) comprised Korean participants from a previously published cross-cultural investigation of teaching styles, while the 2025 dataset ($n = 72$) was collected through convenience sampling via an online Korean PE professional community. Participants completed a Korean translation of a validated Spectrum instrument. For each teaching style, teachers reported usage frequency and evaluated their pedagogical beliefs using Likert-type scales. Cross-temporal comparisons employed descriptive statistics, chi-square tests, and effect size calculations to identify statistically and practically significant changes.

Results indicated substantial pedagogical diversification with differential patterns across clusters. The *Reproduction* cluster showed mixed trajectories: *Command* usage declined precipitously from 94% to 54, *Reciprocal* from 55% to 22%, and *Inclusion* from 59% to 26%. Conversely, *Practice* increased from 68% to 78%, suggesting enduring utility for skill development. The *Production* cluster showed remarkable growth: *Learner-initiated* surged from 23% to 94%. *Divergent production* grew from 50% to 65%, with gains in *Self-check*, *Convergent discovery*, and *Individual program design*. Notably, *Guided discovery* represented the only declining *Production* cluster, falling from 57% to 26%. Teachers' beliefs mirrored usage patterns with attenuated magnitude. Within the *Reproduction* cluster, teachers' beliefs in *Reciprocal* and *Inclusion* weakened considerably, whereas convictions about *Command* and *Practice* remained relatively stable. *Production* cluster beliefs strengthened most significantly for *Divergent production* and *Learner-initiated* styles, with more modest increases observed in *Self-check* and *Individual program design*.

These results illuminate pedagogical diversification rather than replacement, with sustained use of the *Reproduction* cluster alongside growing adoption of the *Production* cluster approaches.

This evolutionary pattern aligns with international movements toward learner-centered education, while acknowledging the continued importance of structured, teacher-directed instruction. The *Reproduction* cluster (e.g., *Practice*) ensures instructional structure and foundational skill mastery, while pronounced growth in *Production* clusters reflects teachers' recognition of student agency, creativity, and autonomous learning. Pedagogical excellence in Quality PE emerges from developing versatile instructional repertoires and applying the complete spectrum responsively to diverse learner needs.

Keywords: pedagogical beliefs, reproductive styles, productive styles, cross-temporal comparison

Mapping the Belief–Practice Gap in the Spectrum Teaching Styles: Perspectives from Chinese Physical Education Teachers

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Mosston and Ashworth's Spectrum of Teaching Styles (2002) remains a leading framework in physical education (PE) programs, widely recognized for its emphasis on instructional diversity. International studies have examined teachers' preferences and reported use of different Spectrum styles, but much less is known about whether classroom practice aligns with pedagogical beliefs. In China, where centralized curriculum standards coexist with calls for student-centered reform, systematic evidence on the belief–practice relationship remains limited. This study, therefore, investigates the belief–practice gap across all eleven Spectrum styles among Chinese PE teachers.

We surveyed 144 in-service PE teachers in China using a culturally adapted instrument covering the eleven Spectrum styles. For each style, teachers reported frequency of use (1 item) and beliefs about pedagogical value (3 items: enjoyment, skill development, motivation). Descriptive statistics were computed to compare teachers' beliefs and use across styles and paired-sample effect sizes (Cohen's *d*) were calculated to estimate the magnitude of the belief–practice gap for each style.

Across all eleven Spectrum teaching styles, teachers' reported beliefs consistently exceeded their reported use, indicating a pervasive belief–practice gap. Mean use ranged from 3.51 to 4.10, while mean beliefs ranged from 3.83 to 4.22. The mean differences were uniformly positive, ranging from 0.10 (Style A) to 0.45 (Style D), corresponding to small-to-moderate effect sizes ($d = 0.12\text{--}0.44$). The largest discrepancies appeared in Styles D, E, and F ($d \geq 0.42$), suggesting strong pedagogical endorsement but limited classroom application. In contrast, Style A ($d = 0.12$) showed the smallest gap, reflecting closer alignment between teachers' convictions and practice. Overall, student-centered or less traditional styles tended to exhibit larger belief–practice discrepancies, whereas teacher-directed styles displayed smaller and more consistent alignment between belief and use.

Chinese PE teachers strongly endorse a wide range of Spectrum styles but report using them less frequently, revealing a consistent belief–practice gap. The persistence of these gaps suggests that contextual and institutional factors constrain the translation of pedagogical commitments into classroom practice. Professional development and organizational support should therefore not only strengthen teachers' pedagogical knowledge but also create classroom conditions that enable the sustained use of a wide range of teaching styles.

Keywords: spectrum of teaching styles, belief–practice gap, physical education, chinese teachers, pedagogical beliefs

Keynote 1. Pamela Kulinna & Donetta Cothran: Scholarship, Friendship, and the Spectrum of Styles around the World

Chair/Discussant: Mark Byra

Scholarship, Friendship and the Spectrum of Styles Around the World

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What began as a young scholar's (Donetta's) desperate cry for statistical help (from Pamela) has somehow wonderfully turned into a 30-year friendship and research adventure that explores the Spectrum of Teaching Styles use around the world. This session will explore the initial development of a survey designed to measure both use and perceptions of the Spectrum and then explore that survey's use by the initial research team and then around the world. Lessons learned, findings and questions that remain will be discussed in an interactive session that allows time for discussion and collaboration.

Initial research with the instrument found that teachers and students reported use/experience with a wide variety of styles. Participants also viewed the styles differently when asked to share their perceptions regarding the learning, liking, and motivating aspects of each style. In general, teachers and college students reported a consistent preference for reproduction teaching styles, which emphasize teacher-directed instruction. In contrast, production styles were less frequently used and were perceived as less effective, likable, and motivating. Although there were exceptions to these overall trends by both style and participant characteristics and those exceptions to the general rule offer some insights into what teachers and students seek from a teaching style. Interestingly, students' self-rated ability and course enrollment also influenced their perceptions with teachers' style experiences being an influence on their perceptions.

Since those initial two studies, the instrument has been translated into at least ten languages and used in at least 14 countries. Participants have expanded from the initial K-12 teachers and college students to include classroom teachers, alternative certification teachers, pre-service teachers in physical education, coaches, and K-12 students. With additional investigations and populations, a more nuanced view of the use of the Spectrum of Teaching styles is emerging to help us better understand how personal, educational systems, and cultural values influence style use and perception. This presentation will share findings of a recently completed scoping review of those expanded investigations and key findings.

Key ideas and remaining questions will also be shared for the participants to consider. For example, despite significant educational and cultural differences, many of the teaching style patterns remain consistent worldwide. Why? Teachers report relatively extensive use of the styles, yet research observations of classroom behavior report less use of styles. Do all participants define and understand the styles similarly? Student perspectives remain relatively unexplored so are there collaborations and resources we can bring to bear on those questions?

These and other key questions will be addressed in small group discussions throughout the session that focus on future directions and collaborative opportunities.

Keywords: teaching styles, perceptions, cross-cultural, belief–practice gap

Poster Session 1: Teacher Education and Preservice Development, Student Experience, and Engagement and Short Interventions

• <i>From Reproduction to Production: Integrating the Spectrum of Teaching Styles and Cooperative Learning in ESOL Teacher Preparation</i> Sildus, T. I.
• <i>Teachers' Self-Reported Use and Perceptions of Mosston and Ashworth's Teaching Styles in Finnish Physical Education</i> Jaakkola, T., Huhtiniemi, M., & Watt, A.
• <i>The Role of Learning Styles within Models-Based Instruction in Teacher Preparation: A Curriculum-Wide Approach</i> Johnson, I. L., & Fetterley, R., & Armstrong, T. L.
• <i>An Investigation into Preservice Teachers' Knowledge and Understanding of the Spectrum of Teaching Style</i> Naik, S. A.
• <i>When Teaching Style Meets Content: Who Uses What, When, and Why? – A Preliminary Study</i> Chen, Y.
• <i>The Mosston & Ashworth Spectrum as a Basis for Designing Differentiated Learning Experiences in the Kindergarten Curriculum</i> Pappa, A., & Sakellariou, M.
• <i>Students' Perception of Teaching Styles According to its Implementation Order in Physical Education Lessons Based on Non-opposition Sports</i> Romero-Parra, N., & Polo-Recuero, B.
• <i>A Dialogical Rebirth of Mosston's Spectrum of Teaching Styles</i> Demirhan, G.
• <i>The discovery-oriented end of the Spectrum of Teaching Styles in North Macedonia physical education: PE teachers' perspectives</i> Klincharov, I., Popevska, B., & Spasikj, J.
• <i>From Inclusion to Learner-Initiated: Developing Self-Regulated Learning Through Mosston's Spectrum of Teaching Styles in Senior High School Physical Education Course</i> Liu, Y.M., & Shy, D.Y.
• <i>Varying Perspectives: What Do Pre-Service Teachers Really Need to Know About the Spectrum of Teaching Styles?</i> Armstrong, T.L., Johnson, I.L., & Fetterley, R.

From Reproduction to Production: Integrating the Spectrum of Teaching Styles and Cooperative Learning in ESOL Teacher Preparation

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As more English Language Learners (ELLs) - students for whom English is not a native language- are entering classrooms in schools both in the United States and worldwide, teachers of all subjects and levels will need to be prepared to meet the global demand for English proficiency. Frequently, English Language Learners who immigrate to a new country face the difficult task of learning the new language and academic content at the same time. Both educational researchers and practitioners have recognized the value of the structural approach to Cooperative Learning as a particularly effective tool for ELLs in facilitating language proficiency and content knowledge through meaningful peer interaction in a supportive context. To maximize the benefits of increased student engagement and academic achievement, teachers must receive quality training and gain confidence in implementing Cooperative Learning structures in the classroom.

Mastering Cooperative Learning structures is a complex skill that requires careful preparation and practice. Besides ensuring positive interdependence, individual accountability, equal participation, and simultaneous interaction, teachers of English Language Learners must also consider the students' cultural and linguistic backgrounds, as well as their levels of acculturation and second-language acquisition.

As a universal framework for understanding the relationship between teacher and student decision-making, the Spectrum of Teaching Styles can be effectively integrated with Cooperative Learning in English for Speakers of Other Languages (ESOL) teacher preparation. This combination, which emphasizes student-centered instruction and active engagement, offers a structured and intentional approach for shifting teaching and learning responsibilities from the educator to the student.

The interactive session focuses on the practical application of the combined approach and the steps involved in preparing ESOL teachers to implement lessons with Cooperative Learning structures in their own classrooms. The presenter provides specific examples to illustrate each step in the progression of the teaching styles: from teachers experiencing the structures as students and mastering them, to developing original lesson plans and conducting their own lessons. The session also discusses scaffolding and accountability, as well as eliciting meaningful reflections. Allowing teachers to experience the structures first-hand and gradually progress to independent and creative production in a positive, socially supportive environment will make them better prepared to serve the needs of all students.

Keywords: cooperative learning; english language learners; spectrum of teaching styles; esol teacher preparation

Teachers' Self-Reported Use and Perceptions of Mosston and Ashworth's Teaching Style in the Finnish Physical Education

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Fifteen years ago, we conducted a study examining Finnish physical education teachers' self-reported use and perceptions regarding Mosston and Ashworth's spectrum of teaching styles (Jaakkola & Watt, 2011). That study involved 294 Finnish physical education teachers, comprising 185 females and 109 males. The survey included items on demographic and professional background (such as gender, teaching experience, educational qualifications, school level, and average class size), as well as questions concerning the extent of use and perceived student benefits of various teaching styles. Findings indicated that the command and practice teaching styles were employed most frequently, whereas the self-check and convergent discovery styles were used the least. Overall, there was a clear tendency toward teacher-centered approaches over student-centered ones. Teachers perceived the practice and divergent production styles as offering the greatest benefits to students, while the reciprocal and convergent discovery styles were seen as the least beneficial.

We are now in a position where there is a need to replicate the study. There are few reasons for it; a) The Finnish core curriculum was revised in 2016 and, compared to the previous version, places greater emphasis on supporting students' basic psychological needs, b) since then, our faculty has trained approximately 1,200 new physical education teachers, and c) over the past 15 years, a substantial amount of educational material has been published to support the Finnish PETE program and in-service training courses for physical education teachers. Therefore, it can be hypothesized that the use of and perceptions toward teaching styles has evolved in Finland. We plan to conduct a follow-up study in January–February 2026 to examine Finnish physical education teachers' use of, and perceptions regarding, Mosston and Ashworth's spectrum of teaching styles. Our aim is to reach approximately 300 teachers with demographic and professional characteristics comparable to those in our original 2011 sample. Data will be collected using the same questionnaire employed in the previous study (Kulinna & Cothran, 2003). The two datasets will be combined, and cohort differences will be analyzed using independent samples t-tests and MANOVAs. The study is expected to be completed in time for presentation at the Spectrum Conference in May 2026.

Keywords: spectrum of teaching styles, Finnish physical education, teaching style perceptions, longitudinal comparison

The Role of Learning Styles within Models-Based Instruction in Teacher Preparation: A Curriculum-Wide Approach

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This session highlights how the Health and Physical Education Teacher Preparation program at Grand Valley State University intentionally integrates the Spectrum of Teaching Styles across the curriculum in conjunction with various curricular models. Grounded in best practices, national standards, and developmentally appropriate pedagogy, the program emphasizes the intentional use, modeling, and practice of various Spectrum styles—such as Command, Practice, Inclusion, Problem-Solving, and Divergent Discovery—to prepare preservice teachers for diverse learning environments.

Participants will see how these styles are systematically introduced, applied, and refined as students' progress through the major. Beginning with an overview in the *Introduction to the Profession* course, preservice teachers learn to identify and apply appropriate teaching styles that align with lesson objectives, learner needs, varying instructional contexts and curricular models. Through coursework, assignments, and hands-on teaching experiences, they develop the ability to adapt and reflect on their instructional choices.

Examples from selected courses will illustrate how specific teaching styles are embedded within models such as Teaching Personal and Social Responsibility (TPSR), Personalized System for Instruction (PSI), Sport Education (SE), Cooperative Learning, and Adventure/Outdoor Education. This alignment enables preservice teachers to experience, analyze, and implement effective instructional practices that foster student engagement, autonomy, and learning within each model.

Keywords: spectrum of teaching styles, teacher preparation, curricular models, preservice instruction

An Investigation into Preservice Teachers' Knowledge and Understanding of the Spectrum of Teaching Styles

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This study investigated preservice physical education teachers' knowledge and understanding of the Spectrum of Teaching Styles and examined differences based on gender and year of education. A total of 139 preservice teachers (52 females, 87 males) enrolled in a Bachelor of Physical Education (BPED) program in Pune, India participated in the study. A researcher-developed bilingual knowledge test comprising 15 items across knowledge, understanding, and application domains was used. Data were analysed using descriptive statistics and two-way ANOVA. Results revealed significant main effects of gender ($p = .038$) and year of education ($p < .001$), with female students and Semester 2 students demonstrating higher knowledge scores. No significant interaction effect was observed ($p = .188$). The findings highlight a concerning decline in pedagogical knowledge across training years, suggesting gaps in curriculum reinforcement and theory–practice integration within physical education teacher education (PETE). Implications for curriculum design and pedagogical training are discussed.

Keywords: Spectrum of Teaching Styles, preservice teachers, pedagogical knowledge, physical education, teacher education

When Teaching Style Meets Content: Who Uses What, When, and Why? – A Preliminary Study

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The goal of the project is to determine the frequency with which each teaching style from the Spectrum of Teaching Styles is used in K-12 physical education and to identify the specific content or activities employed when applying each teaching style. A questionnaire frequently used in the literature for studying physical education teachers' experiences in implementing the Spectrum of Teaching Styles was modified, with an open-ended question asking teachers to provide sample content they commonly teach when employing each teaching style. The participants consisted of 31 K-12 physical education teachers from a state in the Great Plains region of the United States. Descriptive and Pearson correlation analyses were performed to explore the relationship between the variables. Content analysis was conducted to examine the patterns in the qualitative data. The quantitative results showed that teachers used the Practice (B) style most frequently, followed by the Command (A) style and the Inclusion (E) style, while the Self-Teaching (K) style was used least frequently. These results align closely with the existing literature. Furthermore, female teachers are more likely to adopt the Inclusion (E) style more ($p < .05$), teachers who are more familiar with the spectrum of teaching styles are more likely to adopt the Self-Teaching (K) style ($p < .01$), and teachers who teach older students are more likely to adopt the Self-Teaching (K) style ($p < .05$). The content analysis disclosed that physical education teachers utilized different teaching styles to engage students in different areas of content and types of learning activity. For example, more teachers report using teaching styles that enable a high degree of individualized learning (i.e., D, E, H, I) when instructing fitness-related content. Styles that highlight student agency and discovery are clearly linked to activities involving more social interactions and learning (i.e., F, G, J). This study provided some preliminary results to support the value of further discovering the relationship between teaching styles and content.

Keywords: spectrum of teaching styles, physical education teachers, instructional content, teaching style frequency

The Mosston & Ashworth Spectrum as a Basis for Designing Differentiated Learning Experiences in the Kindergarten Curriculum

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The Mosston and Ashworth spectrum, through the typology of the various teaching styles it includes, is a particularly useful theoretical and practical tool in the hands of the modern teacher. It includes elements that can assist in the design, differentiation and reflection of the educational process. This project was implemented in preschool education whose main thematic axis incorporates emotional intelligence, collaboration and technological expression. It was based on the spectrum of teaching styles by Mosston and Ashworth (especially styles E, G, H, I), which promote the differentiation of teaching approaches and the active participation of students, with the aim of cultivating critical thinking, developing creativity and self-regulation of students, in alignment with the objectives of the kindergarten curriculum. The plan included multisensory learning activities, such as recognizing emotions through the use of digital tools, digital storytelling and group constructions. The innovation of the plan lies in the implementation of structured differentiation for a student with amblyopia, with appropriate methodological adjustments, in order to ensure his full and equal participation. The principles of accessibility, guided support, reduction of visual load and enhancement of other sensory channels were applied to the differentiation of activities. The activities were designed in a way that allowed the student to actively participate and express himself in the group, without requiring differentiation of the educational objective. The results demonstrated a high level of engagement, enhanced self-esteem and a positive social climate in the class group. This specific work plan is an example of integration, inclusion, teaching flexibility and technological pedagogy in Kindergarten.

Keywords: spectrum of teaching styles, differentiated instruction, preschool inclusion, multisensory learning

Students' Perception of Teaching Styles According to its Implementation order in Physical Education Lessons Based on non-Opposition Sports

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Recent studies highlight that physical education teaching (PE) must continuously adapt to students' evolving learning preferences and educational demands, which makes it necessary to refine teaching styles to better respond to current learning contexts¹. The purpose of this study was to analyze the influence of the implementation order of teaching styles, in terms or more or less students' decision-making responsibilities, and the type of sport participation (individual or team) on students' perceptions of teaching styles.

Two groups of university students (n=25 and n=22, 62% males and 38% females), in their fourth year of their PE Teaching Degree volunteered to participate in this 4-week study. The sport modality order for both groups was: 1) non-opposition team sports (NOTS) and 2) non-opposition individual sports (NOIS). Considering the Spectrum of Teaching Styles², group 1 was assigned the command style for NOTS and reciprocal style for NOIS. The order for group 2 was the opposite. The Students' Experience and Perception of the Spectrum of Teaching Styles in PE questionnaire³ was administered. A mixed linear model was performed, to explore the objective. Statistical analysis was conducted in R (version 4.4.1; R Core Team, 2024). Data are expressed as mean $\pm$ SEM.

An effect of group in the perception of the reciprocal teaching style ($t = 4.413$; $p < 0.001$) was observed, with higher scores for group 2 (3.52 ± 0.18) in comparison with group 1 (3.15 ± 0.17). However, no differences were observed for the command style between groups ($t = 0.300$, $p = 0.76$). In contrast, an effect of timing was observed for both reciprocal ($t = 3.402$, $p < 0.001$) and command ($t = 2.720$, $p = 0.006$) styles, being the scores higher after the PE lesson based on those styles (3.48 ± 0.17 and 3.69 ± 0.18 , respectively) compared to scores obtained before experiencing the styles (3.19 ± 0.17 and 3.49 ± 0.18 , respectively).

Both command and reciprocal styles received higher scores on students' perception after being experienced in PE lessons independently of sport participation. However, the reciprocal style received higher scores in group 2 (NOIS) than in group 1 (NOTS), suggesting that the reciprocal style might be more suitable for teaching sports based on individual participation (e.g. track and field or gymnastics). Nonetheless, this objective should be further explored by integrating the complete spectrum of teaching styles and examining the different sport modalities to reach a broader understanding of students' perceptions.

Keywords: teaching style sequencing, student perceptions, command–reciprocal styles, sport participation

A Dialogical Rebirth of Mosston's Spectrum of Teaching Styles

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This article presents a dialogue exploring how the Spectrum of Teaching Styles might have developed if Muska Mosston had engaged in direct intellectual exchanges with the important philosophers, educational scientists, psychologists, and cognitive scientists who are thought to have influenced his work. The purpose is to present the results of this dialogue systematically.

The dialogue was created using artificial intelligence (ChatGPT 5) and developed through questions designed to facilitate productive discussions between the ideas of the individuals mentioned and the Teaching Styles Spectrum framework. For instance, one question asked: "If the ancient Greek philosopher Socrates and Mosston had entered into a dialogue, how would the Spectrum of Teaching Styles have taken shape?" The dialogue features important figures such as Socrates, Plato, Aristotle, William James, John Dewey, Edward Lee Thorndike, Martin Buber, Jean Piaget, Jean-Paul Sartre, Burrhus Frederic Skinner, Lev Vygotsky, Carl Rogers, Abraham Maslow, Jerome Bruner, Albert Bandura, Paulo Freire, Humberto Maturana, and Türker Kılıç. These individuals were selected for their significant contributions to ideas related to individual development, education, teaching, and mind formation.

The main topic of the study's conclusion is how Spectrum could be enriched by the insights these thinkers could offer. These dialogue-based hypothetical interactions demonstrate that Spectrum can be redesigned within the framework of connective integrity, self-regulation, cyclicity, experiential learning, freedoms, and developmental assessment.

Ultimately, examining Spectrum through these encounters reveals its deep philosophical foundations and highlights the importance of reflective, theory-driven approaches in education.

Keywords: spectrum of teaching styles, philosophical and scientific dialogue, artificial intelligence in pedagogical research

The discovery-oriented end of the Spectrum of Teaching Styles in North Macedonia physical education: PE teachers' perspectives

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The world scientific and professional community in the field of sports sciences undoubtedly claims that, during the period of growth and development of each person, organized systematic physical exercise causes positive effects on the health and achievements of the individual. The simplest way to ensure that every child and adolescent has access to such process of exercise is through the integration of the subject of physical education in the curriculum for primary and secondary education as a compulsory subject during schooling, which is case in elementary and middle school education in the Republic of North Macedonia.

The teaching approaches and methods through which the desired goals are achieved, have the essential meaning the process of physical exercise to have a corresponding positive effect. The Constraints-Led Approach (CLA) is a teaching method rooted in the ecological dynamics framework, which suggests that skill emerges from the interaction of three categories of constraints: individual, environmental and task constraints. Mosston and Ashworth's Spectrum of Teaching Styles is a continuum ranging from teacher-centered (reproduction) styles to student-centered (production/discovery) styles. The CLA naturally fits with the more indirect, student-led styles at the discovery end where the focus is on developing a pupil's creativity, decision-making, and adaptability rather than simply replicating a prescribed technique.

In this study twelve (12) PE teachers from primary and secondary educational levels were included. Data were collected through semi-structured interviews. The aim was to determine their attitudes and beliefs for possibility of implementing constraints led approach and discovery-oriented end of the Spectrum of teaching styles in their daily work. Thematic analysis was conducted to identify key themes and patterns across the interview data.

There is consensus among the analyzed group of PE teachers in North Macedonia that the adaptive approach of teaching and learning which takes into the consideration the pupil's individual characteristics has a predominate role in their teaching. They prefer to use the pre-defined and determined prescriptive teaching approach only in the first elementary years of schooling in early phases of motor skills acquisition, while later they implement in their teaching mainly the constraints led approach as well as the discovery-oriented end of the Spectrum of teaching styles.

Keywords: constraints-led approach, discovery-oriented teaching, physical education

From Inclusion to Learner-Initiated: Developing Self-Regulated Learning Through Mosston's Spectrum of Teaching Styles in Senior High School Physical Education Course

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The Spectrum of Teaching Styles views teaching as a chain of decision-making, dividing teaching styles into reproduction cluster (A-E) and production cluster (F-K). When decision-making transfers progressively from teacher to learner, it creates different developmental opportunities (Mosston & Ashworth, 2008). Previous research has examined the effect of implementing a specific teaching style on self-regulated learning capabilities (Byra et al., 2014); however, the influence of other teaching styles and the combinations of diverse styles on students' self-regulation capabilities warrants further examination. Adopting Mosston's Spectrum of Teaching Styles from inclusion (E) to learner-initiated (J), this study examined how the progressive decision-making transfer develops high school students' learning toward self-regulation. A qualitative design was employed, involving 120 12th-grade students across four swimming sessions, utilizing purposeful sampling with a maximum variation strategy (Palinkas et al., 2015). From students who completed all sessions and self-reported developing self-regulated learning, we selected four participants representing each of the four skill levels (high, medium-high, medium-low, and low) identified in Style E. The data included semi-structured interviews, teacher journals, and student reflections, which were analyzed through thematic analysis. Trustworthiness was established through data source triangulation.

The findings indicate that all students developed self-regulated learning through the E→F→I→J sequence, although learning paths differed by skill level. First, students learned to set their own goals. High-skilled students started in Style E, while medium- and low-skilled students required more support and began in Style F. Second, Guided Discovery Style (F) served as a critical turning point, where students transitioned from reproducing techniques to discovering solutions. High-skilled students made this shift quickly through body awareness. Low-skilled students needed more time and peer interaction. Third, Styles I and J allowed students to refine their self-regulation. By Style I, all students could independently plan, perform, and reflect on their work. For instance, low-skilled students who had not yet mastered swimming could identify their learning needs (such as improving propulsion), design practice routines (using kickboards and arm strokes), and execute plans without teacher direction. This shows self-regulated learning developed at appropriate levels. Fourth, high-skilled students relied on physical feedback and body awareness. Low-skilled students needed more external guidance during the F-to-I transition.

These findings demonstrate that Guided Discovery Style (F) serves as the critical threshold. Students must successfully cross this threshold—from reproduction to production—to develop self-regulated learning. Self-regulated learning depends on navigating this threshold

successfully, rather than relying on initial technical skill. Future research should investigate why Style F serves as a critical turning point and identify effective support strategies for various skill levels during the F-to-I transition.

Keywords: Mosston's spectrum of teaching styles, decision-making transfer, self-regulated learning, swimming instruction

Varying Perspectives: What Do Pre-Service Teachers *Really* Need to Know About the Spectrum of Teaching Styles?

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In preparing physical education teachers for today's diverse classrooms, it's critical to strike a balance between giving pre-service teachers a solid foundation in the Spectrum of Teaching Styles and avoiding cognitive overload. This session examines physical education teacher education (PETE) faculty and current practitioners to understand what teaching styles they value, and what experiences, education, and practices have formed their beliefs. Based on survey data, we have determined what Spectrum of Teaching styles should be emphasized at the initial teacher certification level in our region, and what concepts are better explored in graduate studies or professional development.

In this poster session, we'll outline initial survey feedback that is critical to developing a realistic scope and sequence in a PETE program that promotes mastery learning. Results also indicate what future professional development needs could be provided to current practitioners based on the teaching styles not currently utilized.

Keywords: Spectrum of Teaching Styles; PETE curriculum; preservice teacher preparation; instructional priorities

Roundtable 1. Relevance of the Spectrum of Teaching Styles with the Promotion of Lifelong Learning Physical Activity

Co-Ordinators: Byra, M., Papaionannou, A., Carraro, A.

Session 2 – Oral Presentations: Spectrum in Teacher Education and Professional Practice

Chair/Discussant: Pamela Kulinna & Donetta Cothran

• <i>Developing Teacher Education through the Spectrum of Teaching Styles: The Experiences and Beliefs of an Early-Career Physical Education Teacher Educator</i> Sun, C. T.
• <i>Mosston's Spectrum in Korean and Chinese Physical Education: Examining Belief–Ability–Use Pathways through Social Cognitive Theory</i> Kim, J., Kulinna, P., Albaloul, O., Liu, D., Min, H., & Cothran, D.
• <i>Using Empirical Spectrum Research to Guide Undergraduate Program Decision Making</i> Parkes, C., & Holden, S. L.
• <i>Creation and Impact of a Multi-Year Developmental Progression Immersion of The Spectrum Across a PETE Program: Phase 1</i> Zagrodnik, J. A., Ward, J. K., & Kirkham, M.
• <i>The Relationship between Preservice Physical Education Teachers' Perceptions of Teaching Styles and Critical Thinking Dispositions</i> Çınargür, Z., & Arslan, Y.

Developing Teacher Education through the Spectrum of Teaching Styles: The Experiences and Beliefs of an Early-Career Physical Education Teacher Educator

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The Spectrum of Teaching Styles (STS) has made significant contributions to enhancing curriculum design and instructional quality. While numerous studies have analyzed its theoretical development, practical applications, and paradigm shifts, research exploring how the STS influences teacher education across different cultural contexts remains limited. Therefore, this study aims to further investigate, within the rapidly changing social and educational landscape of contemporary Taiwan, how early-career physical education (PE) teacher educators implement the STS in teacher education courses, to broaden the functional scope and practical value of the framework. This study employed reflective practice as its primary research method, complemented by a narrative mode of presentation to articulate the research process and analytical insights. It draws upon four PE teacher education courses conducted by an early-career PE teacher educator between August 2021 and July 2023 at a university of sport. The analysis explores how the early-career PE teacher educator grounded her instructional practices in the principles of the STS, formulated pedagogical value judgments, and engaged in critical reflection on her professional growth throughout the teaching process. The findings reveal that the early-career PE teacher educator's prior academic training related to the STS, together with her positive teaching experiences in applying the framework, served as the primary motivation for its continued implementation in teacher education courses. The educator's adjustments to curriculum and instruction were largely guided by the need to address pedagogical challenges, balance teacher–student relationships, foster learning opportunities, and enhance students' autonomy and reflective reasoning. With a comprehensive understanding of the evolving nature of the STS, the framework enabled the educator to respond promptly to policy changes, integrate diverse teaching styles, and design and implement teacher education curricula that address emerging educational needs. Moreover, it provided a coherent evaluative framework for assessing teaching effectiveness. Overall, the STS enhanced the early-career PE teacher educator's professional knowledge and strengthened her educational beliefs. This study is expected to serve as a valuable reference for practitioners in the fields of education and sport, as well as for early-career scholars embarking on their academic careers.

Keywords: spectrum of teaching styles, teacher education, reflective practice, Taiwan

Mosston's Spectrum in Korean and Chinese Physical Education: Examining Belief–Ability–Use Pathways through Social Cognitive Theory

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The Spectrum of Teaching Styles has provided a theoretical framework for understanding teachers' instructional decision-making and has been widely applied in physical education research. However, most studies have focused on individual-level style preferences, while relatively few have examined differences at larger contextual levels, such as nationality. Furthermore, little research has explored how cultural contexts and curriculum structures shape discrepancies between teachers' beliefs and actual uses. China, Korea, and Kuwait share centralized curriculum systems, yet their distinct sociocultural contexts may yield different belief-use patterns.

This study examined in-service physical education teachers' use and beliefs regarding *reproduction* (Styles A-E) and *production* (Styles F-K) clusters across Korea, China, and Kuwait, specifically identifying how belief-use discrepancies vary across countries sharing centralized curricula but differing in sociocultural contexts. A cross-sectional convenience sample of 365 teachers (China $n = 144$, Korea $n = 72$, Kuwait $n = 149$) completed translation of a validated Spectrum instrument. Cluster-level scores were calculated for *reproduction* and *production*, with analyses including two-way ANOVAs with Tukey's post hoc tests, paired-samples t -tests, and effect sizes (Cohen's d).

Two-way ANOVA revealed significant main effects of country, $F(2,724) = 193.04$, $p < .001$, and Country $\times$ Cluster interaction, $F(2,724) = 3.07$, $p < .05$. Chinese teachers scored significantly higher than Korean and Kuwaiti teachers on both clusters ($p < .001$), with no difference between Korea and Kuwait. Belief scores consistently exceeded use scores across all countries ($p < .001$), though gap magnitudes varied substantially. Specifically, China showed moderate discrepancies in *reproduction* ($d = 0.47$) and *production* ($d = 0.53$) clusters, reflecting relatively close belief-use alignment due to partial reform uptake tempered by exam-driven traditions. Korea displayed large discrepancies in *reproduction* ($d = 1.61$) and *production* ($d = 0.96$) clusters, suggesting teachers value traditional approaches but may suppress their use to align with student-centered trends. Kuwait revealed large discrepancies in both *reproduction* ($d = 1.59$) and *production* ($d = 1.23$) clusters, reflecting reforms that elevated awareness but face implementation barriers from limited professional development and insufficient systemic support.

Teachers across all countries recognized both clusters' value but reported lower implementation, revealing a universal belief-use gap with varying magnitudes. These findings demonstrate that even within centralized curriculum systems, sociocultural and policy contexts critically shape how instructional beliefs are enacted. Teacher education and policy initiatives must therefore focus not only on shaping beliefs but also on creating enabling conditions for meaningful translation into actual practice.

Keywords: spectrum of teaching styles, cross-cultural comparison, belief–use discrepancies

Using Empirical Spectrum Research to Guide Undergraduate Physical Education Teacher Education Program Decision Making

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The purpose of this presentation is to describe how two empirical studies investigating preservice and cooperating teachers use of the spectrum of teaching styles has influenced undergraduate program decision making at one American university. The authors have received two research grants from the Spectrum Institute in recent years to investigate how preservice and cooperating teachers utilize teaching styles within the K-12 public school system. The first study investigated the use of teaching styles during an elementary school early field experience methods course. The second study investigated preservice teachers use of teaching styles during student teaching, specifically making comparisons between educative teacher performance assessment (edTPA) lessons and non-edTPA lessons. The results of those studies highlighted the need for several programmatic changes and considerations including class sizes, student behavior, and the timing of methods course scheduling. In addition, the fabrication of manufactured lessons that stem from a fear of the edTPA external review process needs to be addressed if so that a more diverse spectrum of teaching styles can to be better utilized during student teaching. The authors will address how programmatic changes been implemented, provide an opportunity for discussion with faculty members who face similar concerns, and discuss future research recommendations.

Keywords: spectrum of teaching styles, preservice–cooperating teachers, program development, teacher education

Creation and Impact of a Multi-Year Developmental Progression Immersion of The Spectrum Across a PETE Program: Phase 1

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Simonton et al. (2025) recently examined the impact of a one-semester exploration of The Spectrum on pre-service physical education teacher education (PETE) students' beliefs and perceptions. Their findings showed significant increases in students' perceived ability to use Styles A, B, and F, along with greater instructional confidence, an increased desire to apply The Spectrum with K12 students, and requests for more guidance on connecting teaching styles with learning objectives and curriculum models. The authors recommended the development of a multi-semester immersive approach to teaching The Spectrum in PETE programs.

In response to these findings and to the expressed needs of our PETE students, we are implementing a multi-year developmental immersion of The Spectrum within our PETE curriculums at 2 medium-sized public universities. This approach introduces models and reinforces The Spectrum across multiple courses from early coursework through their senior seminar to deepen understanding and application of the styles.

Our presentation will outline the design and developmental sequence of this immersion, key assignments, and instructional methodologies. We will also share preliminary results from PETE student feedback collected through surveys administered in three courses: Methods of Teaching Junior High School Physical Education, Methods of Teaching High School Physical Education, and Curriculum and Assessment from one of the institutions. In addition, two PETE students will join us to discuss how this multi-year experience has influenced their teaching beliefs, skills, and confidence. We welcome feedback and collaboration from attendees to help refine and strengthen this ongoing immersion initiative.

Keywords: spectrum of teaching styles, PETE immersion, preservice teacher development, instructional confidence

The Relationship between Preservice Physical Education Teachers' Perceptions of Teaching Styles and Critical Thinking Dispositions

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The aim of this study was twofold: (a) to examine preservice physical education teachers' self-reported tendencies to use teaching styles, their value perceptions of these styles, and their critical thinking dispositions, and (b) to determine the relationship between preservice physical education teachers' value perceptions of teaching styles and their critical thinking dispositions. The participants ($n = 149$) were comprised of 69 female (46.3%) and 80 male (53.7%) preservice physical education teachers, distributed across third and fourth grades (46.3%). Their mean age was 21.9 years ($SD = 3.62$), and their cumulative Grade Point Average (GPA) was 2.77 ($SD = 0.42$). To gather data, the validated Turkish versions of the '*Physical Education Teachers' Use of Teaching Styles and Perceptions of Styles Questionnaire*' (İnce & Hunuk, 2010) and the '*California Critical Thinking Disposition Inventory*' (Kökdemir, 2003), along with a demographic data form, were employed. The research findings indicate that the most valued teaching styles are reciprocal, guided discovery, problem solving (divergent discovery), and practice. However, the styles most frequently preferred for actual use are command and practice. Gender had a significant effect on the value scores for practice, guided discovery, and problem solving (convergent discovery), with scores being higher for females ($p < .05$). Furthermore, value scores were significantly different between those who intend to use the styles and those who do not ($p < .05$). The factors related to critical thinking disposition were examined for their predictive roles with the perceived values of teaching styles, and highly significant results emerged. The findings indicated that the scores for the following critical thinking sub-dimensions positively predicted the corresponding teaching style value perceptions ($p < .05$): Truth-seeking predicted Practice ($\beta = .24$, $p = .02$); Systematicity predicted Reciprocal ($\beta = .23$, $p = .01$); CT Self-confidence predicted Self-check ($\beta = .24$, $p = .01$); Analyticity ($\beta = .21$, $p = .03$) and Open-mindedness ($\beta = .24$, $p = .03$) predicted Inclusion; Systematicity predicted Guided Discovery ($\beta = .33$, $p = .00$); Inquisitiveness predicted Problem-Solving (convergent discovery) ($\beta = .27$, $p = .01$); and CT Self-confidence predicted Learner Designed ($\beta = .23$, $p = .03$). Overall, the findings reveal that critical thinking dispositions are not only reflective of preservice teachers' cognitive traits but also serve as significant predictors of how they value and internalize diverse teaching styles.

Keywords: spectrum of teaching styles, preservice physical education teacher, critical thinking

Session 3 – Oral Presentations: Learner-Centered Approaches and Student Development

Chair/Discussant: Vassilis Barkoukis

• <i>The effect of teaching styles in physical education lessons on students' beliefs and behaviours: A mapping review</i> Ourda, D., & Barkoukis, V.
• <i>Effects of an Integrated Teaching Styles Intervention on Fitness and Self-Perception in Young Students in Italy</i> Monacis, D., Pascali, G., & Colella, D.
• <i>Advancing Social and Personal Skills through the Spectrum in Japanese Physical Education</i> Haneishi, K., Okade, Y., Murai, R., Ito, M., Fuchikami, M., Matsumoto, T., Murakami, T., Nakayama, S., Ogiwara, T., Teraoka, E., Tsuda, E., Curtner-Smith, M., & Nkala, B.
• Social and Emotional Learning as a Relational Mechanism within the Spectrum of Teaching Styles Wu, P. Y., Wei, F. M., & Shy, D. Y.
• <i>Spectrum of Teaching Styles with Very Young Children</i> Sääkslahti, A.
• <i>Connecting Style F with Teaching Games for Understanding: A Short-term Intervention with Pre-service Teachers</i> Lee M., Simonton, K. L., Shiver, V. N., Vasquez, M., Paterson, J., & Hubona, O.

The effect of teaching styles in physical education lessons on students' beliefs and behaviours: A mapping review

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With increasing concern about physical inactivity and disengagement from sport among youth, especially during adolescence, understanding how teaching styles influence students' beliefs and behaviours in physical education (PE) has become critical. This systematic review aimed to synthesize empirical evidence on the impact of teaching styles, as defined by Mosston and Ashworth's Spectrum of Teaching Styles, on students' motor performance, motivation, enjoyment, and perceptions in PE settings. A structured literature search using Google Scholar yielded 1080 studies, of which 11 met inclusion criteria. These studies involved a total of 900 students, ranging from primary to university level. The teaching styles evaluated spanned both the "reproduction" (e.g., command, practice, reciprocal) and "production" (e.g., guided discovery, self-check) clusters of the Spectrum. Findings showed that while all styles supported motor skill acquisition, student-centred approaches such as reciprocal, self-check, and guided discovery were more consistently associated with enhanced motor learning, intrinsic motivation, enjoyment, and self-regulation compared to teacher-centred methods like the command style. Additionally, qualitative insights emphasized the value of learner autonomy, peer feedback, and individualized progression in fostering positive attitudes toward PE. The review highlights the need for PE educators to consider a broader range of teaching styles to promote not only physical skill development but also motivational and affective engagement. Further research is recommended to explore underrepresented styles, particularly those in the production cluster, to deepen our understanding of their pedagogical value.

Keywords: teaching styles, physical education, student-centered, instruction, motor learning, motivation

Effects of an Integrated Teaching Styles Intervention on Fitness and Self- Perception in Young Students in Italy

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The Spectrum of teaching styles has been widely recognized as a pedagogical model for teaching physical education. However, few studies have investigated the effectiveness of the concrete application of this model for developing physical fitness components (PFC) in children. Due to this lack of knowledge in literature, the present study aims to assess and compare the effectiveness of an experimental intervention based on practice variability and variation in teaching styles, on PFC and self-perception in primary schoolchildren.

The sample consists of 148 children (boys = 76, age = 8.97 ± 0.82 ; girls = 72, age = 9.03 ± 0.77), divided according to BMI cutoff (Normal weight and overweight/obese), and recruited from school participating in SBAM! Project. PFC were assessed pre (t0) and post (t1) the 4 months intervention protocol, with the following physical fitness tests: standing long jump, 4x10m shuttle run, medicine ball throw (1Kg), 20m slalom. Self-perception has been assessed with a validated questionnaire. The experimental-didactic intervention involved the proposal of motor tasks based on practice variability to promote inclusion, following the principles of non-linear pedagogy.

Multivariate analysis of variance was performed to assess significant differences pre and post-intervention on physical fitness components according to gender and BMI cutoff. Results showed statistically significant differences ($p < 0.05$) in both all physical fitness tests and self-perception in all groups, with large effect size.

Production teaching styles, with their emphasis on enhancing students' motor responses, have been shown to foster the learning process and serve as mediating factors for education by supporting the integration of motor, cognitive, emotional, and social functions.

Keywords: Spectrum of Teaching Styles; practice variability; primary school physical fitness; production-based pedagogy

Advancing Students' Social and Personal Skills through the Spectrum of Teaching Styles in Japanese Physical Education

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This presentation reports on the impact of implementing the Spectrum of Teaching Styles (Mosston & Ashworth, 2008) on students' social and personal skill development through the lens of inclusion and social justice in Japanese physical education (PE) settings. The research addresses the urgent need for inclusive, equitable, and student-centered pedagogies in Japan, where traditional PE curricula have emphasized direct instruction and technical proficiency over affective and social learning (Teraoka et al., 2021).

Approximately 300 students (ages 7–18) from nine PE classes participate in the study, receiving instruction through a range of Spectrum teaching styles. The intervention is designed to foster leadership, empathy, teamwork, and self-regulation, with a particular focus on diversity, inclusion, and social justice. Pre- and post-intervention assessments utilize the Social Skills Improvement System (SSIS) Rating Scales (Gresham & Elliott, 2008) and the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) to measure changes in students' social skills, emotional well-being, and behavioral development.

To deepen understanding of the student experience, a subset of students are interviewed to gather their reflections on how the teaching styles influence their social interactions, motivation, and learning. Classroom observations are also conducted to provide additional context to the data, focusing on student engagement, collaboration, and critical thinking during PE lessons. Observations specifically examine; 1) students' engagement with the Spectrum teaching styles in PE lessons, 2) participation in cooperative learning, decision-making, and critical reflection activities, and 3) indicators of student autonomy, cooperation, and social interactions during lessons.

This presentation outlines the research design, data collection strategies, and preliminary findings as well as anticipated contributions to the advancement of inclusive and socially just PE pedagogy in Japan. The findings provide practical insights for educators, administrators, and policymakers seeking to enhance student outcomes through intentional pedagogical strategies.

Collaborating University Scholars:

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- Risako Murai, Tokai University (Japan)
- Tomoko Ogiwara, Juntendo University (Japan)

- Daiki Murakami, Seinan Gakuin University (Japan)
- Saori Nakayama, University of Tsukuba (Japan)
- Emi Tsuda, West Virginia University (USA)
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Keywords: spectrum of teaching styles, inclusive physical education, social-emotional development, Japan

Social and Emotional Learning as a Relational Mechanism within the Spectrum of Teaching Styles

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The Spectrum of Teaching Styles has been widely discussed as a decision-making framework that clarifies who makes decisions, what decisions are made, and when such decisions occur in teaching–learning events (Mosston & Ashworth, 2008). Recent scholarship has positioned the Spectrum within Models-Based Practice, highlighting its value in linking pedagogical models with classroom-level decision structures (Pill et al., 2024). However, although physical education teaching has increasingly been understood as involving cognitive, emotional, social, and relational dimensions (Dudley, 2015; Hemphill et al., 2021), limited attention has been given to how social and emotional learning (SEL) is pedagogically enacted through the decision structures of the Spectrum. This study examined how SEL emerged within the decision-making structure of the Spectrum in a junior-high basketball invasion game unit. Guided Discovery and Convergent Production styles were adopted within a game-based pedagogical context to create opportunities for students to interpret tactical problems, interact with peers, regulate emotions, and assume shared responsibility. Data were collected through classroom observations, learning records, teaching documents, and semi-structured interviews, and were analyzed using thematic analysis (Braun & Clarke, 2006). Findings identified three interrelated themes illustrating how emotions and relationships shaped pedagogical decision-making: 1) Emotional awareness as a pedagogical signal; 2) Collaborative responsibility as relational engagement; 3) Co-construction through emotional attunement. These findings suggest that SEL was not merely an additional learning outcome attached to physical education, but functioned as a relational mechanism through which students participated in, adjusted to, and co-constructed teaching–learning events. By locating SEL within task conditions, decision distribution, and peer interaction, this study offers a way to understand how the Spectrum’s decision structures can make emotional, social, and moral developmental channels pedagogically visible in game-based physical education.

Keywords: Spectrum of Teaching Styles; SEL; relational decision-making; qualitative study; MBP

Spectrum of Teaching Styles with Very Young Children

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Physical education begins during early years. Children's first physical educators are their parents, but as early as children participate in Early Childhood Education and Care (ECEC), ECEC staff becomes important physical educators to children. Therefore, Early Childhood Teacher Education (ECTE) needs to include pedagogical practices and examples of how to support young children's holistic development and inborn drive to be physically active. Spectrum of Teaching Styles have shown to be excellent tools to concretize how ECEC staff can modify their pedagogical teaching for young children to learn and respect their developmental phase in social-emotional, physical, motor and cognitive domains. Spectrum of Teaching Style can be used in child-oriented way. It means choosing teaching styles to support children's individual development and to give opportunities to be creative and increase their perceived competence. Further, in ECTE the teaching styles from spectrum is important to be teach in "upside down" frequency, the most frequent styles listed first. Upside down looks as follows:

- 1) Learner Initiated Style (Style J): Free play is important part of children's life. This style allows autonomy and agency to children. Children need moments without organized activities to stimulate their imagination.
- 2) Learner Designed Individual Program (Style I) can see as "children's own performances". Children love to come up with performances alone or together with others. This kind of self-initiated activity supports children's agency. Own performances strengthen children's sense of competence and working in a group develops their interaction skills.
- 3) Divergent Discovery (Style H): Children may not have a ready-made image. Therefore, they have their imagination at their disposal. Producing different solutions encourages them to try as many different ways as possible to complete the task.
- 4) Problem Solving (Style G): The problem-solving tasks presented by the teacher give room for children experiments and reflections. This way adult support thinking skills, offer the joy of discovery and experiences of success.
- 5) Guided Discovery (Style F): In this teaching style adults' questions help children to reach their zone of proximal development. It is strong moderator to experience joy of learning through discovery. These experiences strengthen children's perceived competence.
- 6) Inclusion Style (E): Young children differ from their previous physical experiences, motor skills and physical characteristics. Therefore, parallel tasks of different levels and difficulty are important to achieve motor tasks and maintain exercise motivation.
- 7) Self-check Style (D): Children's body image can be supported with tasks where children are asked to self-check their own body positions with a ready-made picture, peer's body positions of using mirror.
- 8) Reciprocal Style (C): Young children can observe or analyze one simple task at a time. Therefore, reciprocal style can be used with peer activities.

9) Practice Style (B): When children grow up, they can understand and remember simple rules. Practice style is possible to use successfully in this developmental phase. Simple games, like tag games, become interesting for children.

10) Command Style (A): Activities in simultaneous rhythm like simple song plays, dance, imitation and physically active drama plays increase social cohesion in children's groups.

Keywords: early childhood physical education; child-oriented, Spectrum implementation; developmental pedagogy, autonomy; creativity

Connecting Style F with teaching games for understanding: A short-term intervention with pre-service teachers.

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The Spectrum of Teaching Styles serves as a valuable framework to support knowledge development, offering a toolbox of both reproduction and production strategies for physical education (PE) (Syrmpas & Digelidis, 2021; SueSee et al., 2022). However, data suggest most PSTs continue to lack knowledge and ability in production styles and connection to models-based practices like Teaching Games for Understanding (TGfU), highlighting the need for early intervention (Syrmpas et al., 2019; Pill & Rankin, 2020).

The purpose of this study is to investigate PSTs perceived abilities of teaching style F and its association with TGfU. Three research questions guided this study: (1) To what degree do PSTs perceived abilities and usefulness of style F change pre/post intervention? (2) What strengths and weaknesses do PSTs report in learning about and using style F? (3) What connections do PSTs identify between style F and the tactical approach to teaching games?

A mixed-methods study with PSTs ($N=22$) from two universities who participated in an intervention on Style F and the TGfU model. Data collection included pre and post surveys that assessed the perceived usefulness and ability to teach styles F, G, and H, as well as general teaching self-efficacy. Participants engaged in many Style F activities, including online training modules, in-class lectures, lesson planning and classroom delivery in 3rd–6th grade PE settings, critical incident reflections, and follow-up interviews were conducted with a subsample ($n=8$).

Survey data were evaluated for reliability and composite mean scores via individual MANCOVAs (style F, G, or H; perceived usefulness and ability), with ANCOVA for self-efficacy controlling for university site. Qualitative written reflections and interviews were transcribed and coded using Richards & Hemphill's (2018) collaborative analysis guide.

PSTs perceived ability and self-efficacy significantly improved pre/post. Although positive scores were seen for styles F, G, and H over time, only perceived ability for style F increased significantly. No changes emerged for the usefulness of any style. Qualitatively, in-person engagement was identified as most effective for understanding and applying style F. PSTs reported increased confidence to teach and highlighted that style F's questioning strategies enhanced their ability to promote critical thinking and facilitated their understanding of the TGfU model. Engagement with style F also shifted PSTs teaching beliefs, emphasizing the value of critical thinking and repositioning PE as a space for applied learning rather than recreation alone. Limitations included flexibility in questioning, lack of practice time and exposure prior to implementation based on student prior experience.

This study provides evidence that targeted interventions using style F significantly enhance PSTs perceived ability and general teaching self-efficacy. While online modules support foundational understanding, meaningful growth in instructional identity and readiness occurs when theory is reinforced through active participation. Incorporating style specific experiential learning strengthens professional self-efficacy and deepens connections between model-based practice.

Keywords: guided discovery, perceived ability, TGFU integration, mixed-methods intervention

Keynote 2. Nigel Green: Physical Literacy through the Spectrum: A Pedagogical Framework for Holistic Development in Physical Education

Chair/Discussant: Robin Deng-Yau Shy

Physical Literacy through the Spectrum: A Pedagogical Framework for Holistic Development in Physical Education

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and Vice Chair of the North Western counties Physical Education Association.

This keynote addresses the critical need to cultivate physical literacy as a lifelong disposition, moving beyond traditional, performance-focused approaches in physical education (PE). It will explore the synergistic integration of the concept of physical literacy with Mosston's Spectrum of Teaching Styles, proposing a deliberate pedagogical framework for its effective development within PE. Physical literacy, defined as the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life, represents a holistic goal for modern PE. However, its attainment requires nuanced and varied pedagogical approaches, that recognise the diverse ways in which learners acquire skills, knowledge and dispositions for lifelong engagement in physical activity. Mosston's Spectrum, with its continuum from teacher-directed to student-directed styles, provides a flexible model for this purpose. This conceptual analysis argues that no single teaching style is sufficient to develop all dimensions of physical literacy. Instead, a strategic application of different styles is essential: reproductive styles (e.g., Command, Practice) are highly effective for building foundational physical competence and skill mastery, while productive styles (e.g., Guided Discovery, Self-Teaching) are critical for fostering cognitive understanding, problem-solving skills, autonomy, creativity and confidence. Furthermore, styles like Reciprocal and Inclusion promote social interaction, empathy, and personal responsibility, directly contributing to students' motivation and valuing of physical activity. By aligning teaching strategies with the multidimensional components of physical literacy, educators can design inclusive, meaningful, and engaging learning experiences that empower all pupils. The keynote concludes that by utilising the Spectrum effectively, pedagogical flexibility allows educators to move beyond a one-dimensional focus on performance to create learning environments that intentionally and simultaneously cultivate the affective, physical, cognitive, and behavioural domains of an individual. This approach empowers both teachers as decision-makers and students as active participants in their lifelong physical literacy journey.

Keywords: physical literacy, pedagogy, physical education, holistic development, teaching strategies.

Session 4: – Oral Presentations: Pedagogical Innovations and Application of Teaching Styles

Chair/Discussant: Brendan SueSee

• <i>The effects of Spectrum of Teaching Styles Knowledge on Teachers Implementing the Pedagogies of Game Based Approach (GBA)</i> SueSee, B., Pill, S., & Davies, M.
• <i>Scaffolded the Spectrum within Sport Education: Enhancing Quality and Motivation of Peer Teaching through Self-Determination Theory</i> Wei, M., Liu, H., & Hastie, P.
• <i>Applying The Spectrum of Teaching Styles to Health Content</i> Mellor, C., & Bryant, L. G.
• <i>Innovating Martial Arts Pedagogy: A Gradual Empowerment Approach</i> Liu, I. C., & Chang, C. W.
• <i>Promoting Physical Literacy through the Spectrum of Teaching Styles</i> Gorozidis, G. S. & Sympas, I. K.
• <i>Guided Discovery, Reciprocity, and Inclusion in Sport Education: Advancing Teaching Style Integration for Motivated Learning</i> He, W., Mao, W., Liu, H., Rhoades, J., & Walch, T.
• <i>Teaching Styles in HIIT and Their Influence on Exercise Adherence: A Qualitative Video-Based Study</i> Claro, J., Gomes, L., Gil, P., & Carreiro da Costa, F.

The effects of Spectrum of teaching styles knowledge on teachers implementing the pedagogies of Game Based Approach (GBA)

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Some (SueSee et al., 2022) have suggested The Spectrum of Teaching Styles (The Spectrum) could assist teachers implementing Models Based Practice (MBP) and narrow the gap between the hope and the happening (Casey et al., 2020). Further to this Casey (2014) has asked are MBP great white hopes or great white elephants? This project was undertaken as part of research project to determine the effects of the Spectrum of Teaching Styles on teacher's use of a Game Based Approach (Models Based Practice).

Four teacher participants volunteered to have three of their lessons video recorded to establish they were using features of a GBA when teaching physical education. Prior to the recording they were shown a diagram (Figure 1) and asked do they use a GBA with the features in the diagram to teach physical education.

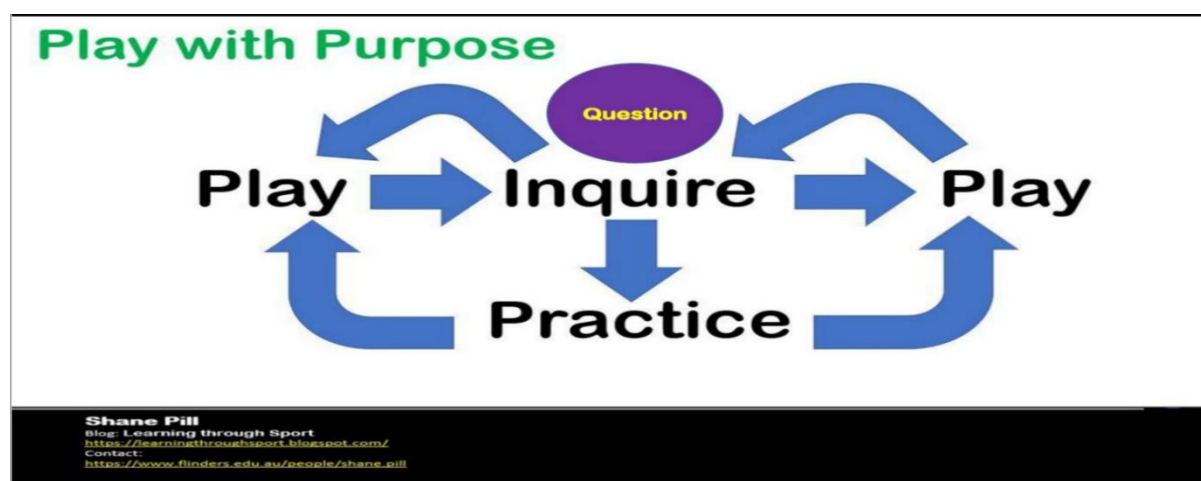


Figure 1. Game Based Approach Features. <https://learningthroughsport.blogspot.com/>

The video recorded lessons were used to confirm they had used a GBA.

The participants then had a 90-minute Spectrum of Teaching Styles workshop presented to them demonstrating practical examples of each of the 11 styles, theory of each style and opportunities for questions and discussion.

Each teacher was then individually interviewed using semi-structured interviews where they were shown three video clips of teaching episodes identified as them using a GBA. They were then asked, "Considering the Spectrum of Teaching Styles workshop you recently completed, would you teach this episode you just viewed the same or different"?

Results indicated the teachers identified different teaching styles from the Spectrum they would use to teach the GBA episode again differently. Preliminary interview analysis shows that Spectrum knowledge led teachers to suggest they would teach a GBA differently by incorporating Guided Discovery, Convergent Discovery and Divergent Discovery more specifically in their episode,

Keywords: spectrum of teaching styles, game-based approaches, teacher decision-making, pedagogical refinement

Scaffolded the Spectrum within Sport Education: Enhancing Quality and Motivation of Peer Teaching through Self-Determination Theory

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While Sport Education (SE) is recognized for fostering teamwork and authentic sport experiences, there is limited evidence on how systematic pedagogical scaffolds can help student coaches effectively implement team practice and maintain supportive learning environments.

Grounded in Self-Determination Theory (SDT) and the Spectrum of Teaching Styles (the Spectrum), the purpose of this mixed-methods study explores how scaffolded implementation of reciprocal (Style C), learner-designed individual program (Style I), and learner-initiated (Style J) teaching styles within SE enhances the instructional quality of peer teaching, and how this impacts peers' motivation, skill proficiency, and game performance in student-led physical education.

A total of 44 students from a university in the U.S. Midwest are participating in the study. The eight-week intervention involved meeting three times per week for 50-minute sessions, where participants engaged in structured lessons consisting of direct instruction, peer-led team practices, and competitive games. Student coaches are assigned the responsibility of organizing and leading team practice sessions using reciprocal, learner-designed, and learner-initiated teaching styles.

Quantitative measures included pre- and post-assessments of sport-specific skill performance, while game performance was evaluated using the Game Performance Assessment Instrument (GPAI). To assess psychological outcomes, participants completed a 29-item questionnaire measuring their autonomy, competence, and relatedness. For qualitative data, GoPro recordings of student coaches' instructions, weekly training plans, and weekly logs provided a deeper understanding of how instructional styles were practically applied to create a need satisfaction peer teaching environment.

The repeated measures MANOVA analyses showed significant improvements in sport-specific skill test performance across all three sports. Participants demonstrated greater accuracy and consistency at posttest, with significant effects seen in badminton, $F(1, 20) = 37.15$, $p < .001$, $\eta^2 = .65$, $d = 1.33$; volleyball, $F(1, 13) = 49.02$, $p < .001$, $\eta^2 = .79$, $d = 1.87$; and table tennis, $F(1, 8) = 30.12$, $p < .001$, $\eta^2 = .79$, $d = 1.33$. A similar pattern of improvement was noted in game performance measures. In badminton, although the effect did not reach statistical significance, $F(1, 20) = 3.60$, $p = .072$, $\eta^2 = .15$, $d = 0.41$, participants showed a positive mean gain after the intervention. In contrast, significant improvements were found in volleyball, $F(1, 13) = 43.05$, $p < .001$, $\eta^2 = .77$, $d = 1.75$, and table tennis, $F(1, 8) = 9.25$, $p = .016$, $\eta^2 = .54$, $d = 1.01$. Additionally, satisfaction with autonomy, competence, and relatedness increased significantly ($p < .001$, $\eta^2 = .23 - .33$), while frustration in all domains decreased ($p < .001$, η^2

= .42 - .53). Qualitative analysis using deductive-inductive coding showed that reciprocal style supported shared accountability and rich feedback exchange, learner-designed style encouraged shared progress, and learner-initiated style promoted experimentation and shared authority. However, moments of frustration revealed the challenges student coaches and their peers faced when tasks were ambiguous, repetitive, or exceeded their current capabilities.

This study indicates that using pedagogical scaffolds - focusing on planning, task presentation, and feedback exchange - enhances the student coach's instructional quality to foster a need-supportive learning environment within SE, thereby improving both motivation and performance outcomes.

Keywords: sport education, peer coaching, autonomy-supportive instruction, reciprocal and learner-designed style

Applying The Spectrum of Teaching Styles to Health Content

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The purpose of this study was to examine the perceptions of two novice graduate students' teaching of health concepts when using The Spectrum of Teaching Styles and its effect on their secondary professional socialization.

Research Questions:

1. Were the graduate students able to utilize The Spectrum of Teaching Styles in a health course?
2. Which styles were most compatible with a health course setting?
3. From the teacher's perspective, how has using The Spectrum of Teaching styles influenced their delivery of health content?
4. How has utilizing The Spectrum of Teaching Styles influenced their secondary professional socialization?

Data collection was gathered by four techniques per participant: one pre-test on the Spectrum, three semi-structured interviews, three journal entries, and three observational field notes conducted by the authors. The pre-test occurred first. The test had a verbal component, multiple choice questions, and three essays. The first of the three semi-structured interviews occurred before the semester, the second in the middle, and the final was at the end of the semester. The journal entries followed the same timeline as the interviews. The observational field notes also followed the same structure as the journal entries and interviews.

Trustworthiness and reliability were achieved by conducting member checking, triangulation by data sources, and peer debriefing.

The graduate students were able to utilize the spectrum to some degree. They felt that the middle of the spectrum continuum was most helpful(C,D,E,F), that command and practice was difficult but achievable in some capacity (A,B), and that the majority of the productive side was difficult due to their understanding of the approach (G,H,I,J,K). They discussed having success with several teaching styles, while others were not as easy to capture in a classroom. The graduate students also discussed that some of the traditional classroom approaches were just as helpful as utilizing the Spectrum. However, they admit that some of the traditional approaches shared similarities with the spectrum. Preliminary data suggests that their professional socialization did have an impact on their ability to teach the Spectrum and the reteaching of the method in a health course helped solidify prior knowledge.

Keywords: spectrum of teaching styles, novice teachers, health education pedagogy, professional socialization

Innovating Martial Arts Pedagogy: A Gradual Empowerment Approach

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Martial arts instruction in elementary PE has traditionally been dominated by teachers, reflecting the master-apprentice model rooted in Chinese culture. While this preserves cultural values of respect and discipline, it limits student agency and engagement. In the context of Taiwan's "2030 Bilingual Nation Policy", modernizing martial arts education requires approaches that both honor tradition and empower students through diversified pedagogy and bilingual learning opportunities.

This study implemented a three-week martial arts curriculum for lower-grade elementary students in Taipei, integrating Spectrum teaching styles including Command, Practice, Reciprocal, and Self-Check along with bilingual instruction. The curriculum was structured in three progressive phases: self-directed practice, interactive peer learning, and cooperative group learning. Data included self and peer assessment checklists, reflection sheets, classroom observations, and teaching logs. Data analysis consisted of thematic categorization and constant comparison approach.

Findings showed that students improved motor accuracy, engaged actively in giving and receiving feedback, and frequently used functional English during class. Reflections and creative work indicated enhanced awareness of cooperation, respect, and responsibility. The teacher-researcher also shifted from an authoritative demonstrator to a facilitator of decision-making and reflective learning. This study demonstrates that incorporating multiple Spectrum teaching styles fosters a gradual empowerment process in martial arts instruction, aligning cultural heritage with contemporary goals of bilingual and student-centered PE.

Keywords: martial arts education, bilingual pe, action research

Promoting Physical Literacy through the Spectrum of Teaching styles

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Physical literacy can be described as the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life (IPLA, 2017). As Physical Literacy (PL) emerges as a central Physical Education goal worldwide, a coherent and effective theoretical framework is necessary to consistently support the promotion of PL across all educational levels, varied contexts and diverse populations. The main purpose of the present study is to analyze and explain with empirical evidence and practical examples why The Spectrum of Teaching Styles (Mosston & Ashworth, 2008) is the optimal pedagogical framework for the development of all PL components, namely motivation and confidence (affective domain), physical competence (physical domain), knowledge and understanding (cognitive domain), and engagement in lifelong physical activity (behavioral domain).

PL emphasizes the significance of a holistic and integrated approach to mind-body development. Consequently, promoting PL in physical education requires holistic teaching-learning approaches that enable teachers to systematically develop not only physical competence but also cognitive, psychological, and social capabilities. The Spectrum of Teaching Styles aligns with these requirements by fundamentally embracing a holistic perspective on physical education that integrates physical, cognitive, affective, and social learning domains.

Indeed, even though applied research on teaching styles varies considerably and some styles have substantially more research evidence than others, compelling empirical findings suggest that the spectrum of teaching styles has the potential to enhance all the core elements of PL in various settings. For example, styles from the reproduction cluster (A-E), e.g., Practice (B) and Reciprocal (C) styles have demonstrated large effect sizes for motor skill acquisition (physical domain); Practice (B), Self-Check (D), Inclusion (E), and Guided Discovery (F) styles utilization found to enhance students' cognitive processes (cognitive domain); Reciprocal (C), Self-Check (D) and Inclusion (E) styles were connected positively with intrinsic motivation and enjoyment in PE lessons (affective domain); Practice (B), Reciprocal (C), Self-Check (D), Inclusion (E), and Guided Discovery (F) styles use were likely to produce higher engagement, effort and long-term participation in PE lessons (behavior domain).

In summary, the Spectrum of Teaching Styles seems an effective, empirically-supported, and flexible pedagogical framework that provides physical educators the appropriate tools to comprehensively enhance PL. The Spectrum adoption enables teachers to select evidence-based styles tailored to diverse students' developmental needs across various educational contexts. This adaptive approach holds the potential to cultivate holistic student development by promoting all dimensions of PL.

Keywords: physical literacy, spectrum of teaching styles, physical education, holistic development

Guided Discovery, Reciprocity, and Inclusion in Sport Education: Advancing Teaching Style Integration for Motivated Learning

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Physical education (PE) plays a vital role in promoting lifelong physical activity and supporting students' physical and psychosocial development. Yet, sustaining student motivation remains a persistent challenge, as engagement often declines once external requirements are removed. To enhance motivation and learning, PE instruction must balance structured skill development with opportunities for autonomy, collaboration, and inclusion.

Grounded in Self-Determination Theory (SDT), this study draws upon three Spectrum teaching styles, Guided Discovery, Reciprocal, and Inclusion, to meet students' needs for autonomy, competence, and relatedness. When these teaching styles are embedded within the Sport Education (SE) model, which emphasizes authentic team roles, cooperative learning, and student leadership, they collectively create a need-supportive, student-centered learning environment that may enhance motivation and learning outcomes in PE.

This study examined how integrating Guided Discovery, Reciprocal, and Inclusion teaching styles within a Sport Education framework influences students' motivation, psychological need satisfaction, skill performance, and physical activity engagement.

Participants included 35 undergraduate students enrolled in volleyball and badminton activity courses at a midwestern university in the United States. The eight-week intervention consisted of three 50-minute sessions per week, combining direct instruction, peer-led team practice, and formal competition. Student coaches led team practices that incorporated the three Spectrum teaching styles to promote guided exploration, peer feedback, and differentiated task choices. A pretest–posttest design was employed. Skill performance was assessed in volleyball (setting and passing) and badminton (forehand clear). Psychological measures included validated scales assessing autonomy, competence, and relatedness, as well as motivation using the Sport Motivation Scale-II. Physical activity intensity was objectively recorded with heart-rate sensors. Paired-sample t tests were conducted to compare pretest and posttest outcomes.

Data collection is ongoing and expected to include 35 participants by May 2026. It is hypothesized that integrating Spectrum teaching styles into the SE model will enhance students' motivation, need satisfaction, skill performance, and physical activity engagement. The findings are expected to advance understanding of model-based practice (MBP) by providing empirical evidence on how multiple teaching styles can be synergistically implemented to foster motivation and learning in PE. This work will inform evidence-based instructional design for motivating, inclusive, and skill-enhancing physical education environments.

Keywords: spectrum teaching styles, sport education model, guided discovery, reciprocal, inclusion, motivation, model-based practice

Teaching Styles in HIIT and Their influence on Exercise Adherence: A Qualitative Video-Based Study

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Introduction: Dropout from exercise programs remains a major challenge, with estimates suggesting that up to 40–65% of gym members discontinue participation within the first 5 to 8 months. Even in structured fitness settings, adherence rates are often low, ranging from 11% to 19% depending on training frequency and individual characteristics. High-intensity interval training (HIIT) has demonstrated potential for increasing engagement, but compliance remains variable, with average adherence rates around 63% (SD = 21.1%) across interventions. Understanding how pedagogical strategies influence participants' perceptions of motivation, competence, and inclusion may offer new insights into factors affecting adherence. Despite the growing body of research on adherence and affective responses to HIIT in fitness settings, no studies have yet examined how the pedagogical structure of HIIT sessions, specifically the teaching styles adopted by instructors influences participants' adherence or maintenance of practice. Existing literature has mainly focused on physiological outcomes, motivational correlates, or affective responses rather than on the instructional processes that underpin sustained engagement.

Purpose: This qualitative study aims to explore how different teaching styles employed in HIIT sessions are perceived by participants, and how these perceptions shape their intentions to continue or abandon structured exercise programs.

Methods: Participants were adult fitness practitioners (89% female, 55% reporting spinal injuries) who completed three HIIT sessions based on different pedagogical approaches (Command, Inclusive, and combined). Sessions were video-recorded to capture teaching strategies and participant behaviours. After each session, focus groups explored perceptions of motivation, satisfaction, perceived competence, exercise intensity, and intentions to continue HIIT participation. Data were analysed using thematic analysis, integrating observational and interview data to identify pedagogical mechanisms linked to exercise adherence intentions.

Results: Thematic analysis identified four main themes: (1) externally regulated intensity and effort as a quality marker in the Command Style; (2) structured choice and perceived competence in the Inclusive Style; (3) instructional clarity as a shared pedagogical foundation across approaches; and (4) preference for a combined pedagogical approach. Participants associated directive teaching with greater structure, control, and perceived effectiveness, whereas inclusive practices were linked to autonomy, adaptability, and perceived competence. The combined approach was viewed as most favourable, as it balanced instructional guidance with opportunities for individual adjustment. Overall, findings indicate that HIIT adherence intentions are shaped not only by exercise intensity itself, but also by how intensity is pedagogically regulated and aligned with participants' perceived capacities.

Conclusion: This study highlights teaching style as a relevant pedagogical variable influencing participants' experiences and adherence intentions in HIIT contexts. Findings suggest that combining structured instruction with adaptable intensity options may enhance exercise experiences and support sustained participation in structured exercise programmes. These results have practical implications for fitness professionals aiming to reduce dropout and promote long-term engagement in HIIT.

Keywords: Teaching styles, HIIT, adherence, pedagogy, qualitative research.

Session 5 – Oral Presentations: Teaching Styles and Cognitive Mechanisms in Action

Chair/Discussant: Maria Espada Mateos

• <i>Reciprocal Teaching Style: How to Increase Student Situational Interest?</i> Lentillon-Kaestner, V., & Roure, C.
• <i>Reciprocal Style of teaching, Self-Transcendence Climate, Teamwork, and Flourishing</i> Lygourioti M. E., & Papaioannou, A. G.
• <i>Unpacking Peer Feedback in the Reciprocal Style: Qualitative Analysis in High School Volleyball</i> Çınargür, H.E, Cetin, U.B., & Erturan, G.
• <i>Underlying Mechanisms of Command, Practice and Self-check Styles: The role of executive functions and performance calibration</i> Kolovelonis, A., & Syrmipas, I. K.
• <i>Exploring Teacher and Student Interactions through the Spectrum of Teaching Styles: A Case Study in Japanese Junior High School Physical Education</i> Ito, M., Haneishi, H., Curtner-Smith, M., Nkala, B., Matsumoto, T., & Okade, Y

Reciprocal Teaching Style: How to Increase Student Situational Interest?

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Regarding the theoretical framework of person–context interaction, situational interest (SI) has been recognized as a critical construct for understanding students' motivation and engagement in physical education. The present research, conducted through two sequential studies, investigated the influence of dyad composition (self-selected vs. ability-based), perceived competence, and feelings of relatedness on students' SI within the reciprocal teaching style in physical education (PE).

The first study involved 99 students enrolled in a badminton unit and examined whether dyad composition could differentially impact SI, perceived competence, and feelings of relatedness. Using repeated-measures analyses, the results demonstrated that self-selected dyads consistently yielded higher levels of SI, competence, and relatedness compared to ability-based dyads, thereby underscoring the motivational benefits of autonomy in partner selection.

Building on these findings, the second study sought to disentangle the relative contributions of competence and feelings of relatedness in predicting SI. MANOVAs and cluster analyses were conducted with 99 students in a football unit and 109 students in a gymnastics unit. The analyses revealed that, within self-selected dyads, perceived competence exerted only a marginal effect, whereas feelings of relatedness emerged as the primary determinant of SI. These results highlight the central role of peer relationships in sustaining students' SI during reciprocal learning tasks.

In conclusion, the findings provide robust evidence that implementing self-selected dyads represents a pedagogically effective and efficient strategy for fostering SI in PE. This approach not only enhances students' motivation through the promotion of social relatedness but also offers a pragmatic advantage for teachers, given its lower organizational demands compared to alternative grouping methods.

Keywords: situational interest, reciprocal style, dyad composition, relatedness and motivation

Reciprocal Style of teaching, Self-Transcendence Climate, Teamwork, and Flourishing

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Mere participation in Physical Education does not automatically guarantee positive social outcomes, as the quality of interactions and the learning climate play a determining role. Based on recent extensions of theory and research on motivational climate that added the self-transcendence climate dimensions to the known mastery and performance climate dimensions (Sereli, S., & Papaioannou, A. G. (2024). Perceptions of Teachers' Emphasis on Self-Transcendent Goals and Students' Social Self-Efficacy and Socially Shared Regulation in Physical Education. *Journal of Teaching in Physical Education*, 44(3), 551-563.), the present study examined the effectiveness of a six-week intervention using the reciprocal style of teaching (Mosston & Ashworth, 2008) as the primary pedagogical tool, aiming to create a student-created motivational climate.

The study involved 316 tenth-grade students, divided into an experimental group (n = 199) and a control group (n = 117). In the experimental group, decision-making shifted to the students, who alternated between the roles of the doer and the observer, providing immediate feedback using criteria sheets. Conversely, the control group followed the standard curriculum through teacher-centered approaches.

The results of the analyses showed that the intervention significantly enhanced the student-initiated climate promoting Self-Transcendence goals and decreased the student-initiated climate promoting performance approach goals in the experimental group, in comparison to the control group. Furthermore, the reciprocal style of teaching acted as a catalyst for psychosocial well-being, significantly improving students' teamwork, and psychological flourishing. The findings suggest that structured peer-tutoring interaction transforms the classroom into a caring community, substantially promoting a self-transcendence climate, teamwork and psychological flourishing.

Keywords: reciprocal style, self-transcendence climate, peer tutoring, psychosocial flourishing

Unpacking Peer Feedback in the Reciprocal Style: A Qualitative Analysis of Feed-Forward in High School Volleyball

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Quality Physical Education (QPE) necessitates a shift from traditional teacher-centered instruction towards more student-centered approaches and Mosston and Ashworth's Spectrum of Teaching Styles (2008) provides a robust theoretical framework for this transition, offering a range of styles that progressively shift decision-making to the learner. The Reciprocal Style (RS), the *observer* provides immediate, criterion-based feedback to the *doer*. While the theoretical benefits of the RS are well-documented, the actual quality and nature of the feedback that students generate remain a critical area for investigation. Effective feedback should be forward-looking—or "feed-forward"—guiding the learner on how to close the gap between their current performance and the desired outcome (Ramaprasad, 1983; Black & Wiliam, 1998). The primary purpose of this study was to qualitatively investigate the nature of feed-forward statements and other feedback types produced by high school students during peer assessment activities structured within the RS.

This qualitative study was conducted with 127 ninth and tenth-grade students in four physical education (PE) classes facilitated by four pre-service PE teachers in Denizli, Türkiye. The study was implemented over a two-week volleyball unit, based on the RS. The observer's role was to assess the doer's performance using a teacher-developed rubric and provide written feedback on a worksheet. The primary data source consisted of these written comments. Data were analyzed using an inductive content analysis approach (Creswell, 2016). Three researchers coded the data to ensure inter-rater reliability and the trustworthiness of the findings.

The analysis of the student-generated feedback revealed three overarching themes:

1. *Learning-Oriented and Feed-Forward Statements*: Many students were able to produce specific, corrective feed-forward and evaluative feedback that confirmed correct technique. This demonstrates that the RS can successfully elicit feedback that supports skill acquisition.
2. *Motivational and Socially-Oriented Feedback*: A significant portion of the feedback included motivational encouragement, positive affirmations, and comments reflecting friendship dynamics. While fostering a positive climate, this type of feedback often lacked the specificity needed to improve performance, a finding consistent with Self-Determination Theory's emphasis on relatedness (Ryan & Deci, 2000).
3. *Non-Constructive and Passive Engagement*: This theme encompassed passive, minimal responses, which indicated a superficial engagement including instances of bullying and mockery, highlighting the potential for negative social dynamics to undermine the instructional goals of RS, a known issue in adolescent peer interactions (Stockdale et al., 2002).

The findings confirm that the RS is a valuable tool for promoting QPE by actively engaging students in the assessment process. This study underscores the critical role of the teacher in not only structuring the learning environment but also in explicitly teaching students how to provide constructive, respectful, and goal-oriented feed-forward. To fully realize the potential of the RS, practitioners must scaffold the feedback process, set clear expectations for communication, and actively manage the classroom's social climate.

Keywords: reciprocal style, peer feedback quality, feed-forward guidance, student-centered assessment

Underlying mechanisms of the command, practice and self-check styles: The role of executive functions and performance calibration

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This research project investigated the underlying mechanisms of the Command, Practice, and Self-Check Teaching Styles within the context of elementary physical education (PE) focusing on the influence of these teaching styles on students' executive functions, sport performance and performance calibration. The impact of the teaching styles on students' motivation to participate in PE was also explored.

Eight PE teachers and approximately 250 fifth- and sixth-grade students were recruited from four elementary schools in Central Greece to participate in the two studies of this research. More specifically, in study 1, six of the PE teachers were equally divided into three groups implementing three different teaching styles (i.e., the Command, the Practice, and the Self-Check Teaching Style) in fifth and sixth graders attending three different elementary schools. PE teachers delivered six ready-made basketball lesson plans focusing on skills like passing, dribbling, and shooting. These lesson plans included the same content for all groups and what was different was the teaching style used to deliver it. In study 2, the same teachers delivered a ready-made lesson plan including football passing skills, employing the same three distinct teaching styles in another group of fifth and sixth graders. Two additional PE teachers with their fifth- and sixth-grade classes served as the control group in study 2. A pre- and post-intervention, and retention (only in study 1) design was used to capture changes over time. Students' executive functions were measured with the design fluency test (Delis et al., 2001), their motivational regulations (study 1) were assessed with the Motivational Orientations Questionnaire (Vlachopoulos et al., 2011) and their situational interest (study 1) was measured using the Greek version of the Situational Interest Scale (Roure et al., 2016). Additionally, in both studies students' sport performance alongside tests related to performance calibration were also used. The fidelity of the intervention was ensured through a dual approach: field observations using a checklist and self-monitoring by the PE teachers. More specifically, researchers observed two lessons delivered by each one of the PE teachers using an observation check list. In addition, after each session, the PE teachers documented the accuracy of teaching style implementation by filling in a checklist document.

The findings are anticipated to provide crucial insights into the pedagogical efficacy of these specific teaching styles in elementary PE, highlighting its potential role in developing key cognitive skills and self-assessment abilities (performance calibration), thereby influencing both students' engagement (motivation) and their actual skill acquisition and execution (sport performance).

Keywords: executive function, performance calibration, sport performance, command, practice, self-check, physical education

Acknowledgment: This work was supported by funds received from the Spectrum Institute for Teaching and Learning, Research Grant Program.

Exploring Teacher and Student Interactions through the Spectrum of Teaching Styles: A Case Study in Japanese Junior High School Physical Education

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This study investigates how a Japanese junior high school physical education (PE) teacher applies the Spectrum of Teaching Styles (Mosston & Ashworth, 2008) to support students' social development. The case is part of a broader research project examining pedagogical equity and inclusion in Japanese PE. Grounded in critical and sociocultural perspectives (Blackshear & Culp, 2023; Freire, 1970; Hellison, 2011), the study focuses on how a teacher's experiences, beliefs, and instructional decisions intersect to shape classroom interactions that foster communication, empathy, and cooperation.

In Japan, PE has traditionally emphasized discipline, skill mastery, and performance (Teraoka et al., 2021), often overlooking the social and personal dimensions of learning that contribute to students' holistic growth. The Spectrum provides a pedagogical framework that enables teachers to purposefully shift along a continuum of decision-making, from directive to learner-centered, creating opportunities for students to develop autonomy, social responsibility, and mutual respect.

This qualitative mixed-methods case study centers on one experienced PE teacher who participated in a 6-hour professional development workshop on applying the Spectrum to enhance social learning. Following the workshop, the teacher designed and implemented an eight-lesson unit that intentionally integrated multiple Spectrum styles, including Command, Practice, Reciprocal, and Guided Discovery, to promote peer interaction, collaborative problem-solving, and reflective dialogue.

Data collection consists of three complementary sources: (1) systematic classroom observations and video-based coding using a modified version of the Instrument for Identifying Teaching Styles (Curtner-Smith et al., 2001) to capture instructional behaviors and teacher-student interactions; (2) student questionnaires employing the Social Skills Improvement System (Gresham & Elliott, 2008) to measure pre- and post-unit changes in cooperation, communication, and self-control; and (3) semi-structured interviews with the teacher exploring pedagogical reasoning, reflections on classroom experiences, and perceptions of students' social growth.

At the time of submission, lesson implementation and data analysis are ongoing. The presentation will provide an overview of the study's conceptual framework, research design, and methodological approach, and it will share the findings and interpretations at the conference. This case aims to contribute to the growing body of Spectrum-based research by

illustrating how intentional pedagogical decision-making can cultivate students' social learning within the unique cultural context of Japanese PE.

Keywords: social learning in PE, pedagogical equity, junior high school

Keynote 3. Marios Goudas: Students' Motivation in Physical Education and the Spectrum of Teaching Styles: Linking Research Lines

Chair/Discussant: Athanasios Papaioannou

Students' motivation in physical education and the Spectrum of Teaching Styles: Linking research lines

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The Spectrum of Teaching Styles has been widely employed by physical educators throughout the world. At the same time there has been extensive research on the application and the effectiveness of the proposed teaching styles. Part of this research has considered motivational factors related to specific styles. This presentation will present empirical studies that examined the effects of the self-check and the reciprocal styles in the context of motivational theories. In addition, the realities of the application of these styles in large-scale teacher-education programs will be outlined. Further, proposals for extending the Spectrum- related research in relation to motivational theories will be offered.

Links between two motivational theories and the teaching styles will be examined. In particular, the fit of the above-mentioned teaching styles to Zimmerman's models of the process and the development of self-regulation and models of collaborative learning such as the conceptual approach and the structural approach will be outlined. Proposals for extending the Spectrum-related research base involve examining the effect of individual factors and the student-teaching style fit.

Keywords: self-check, reciprocal; motivational theories, self-regulation

Poster Session 2: Teaching Styles, Motivation, and Student Experience: Contemporary Research on the Spectrum in Physical Education

• <i>Spectrum of Teaching Styles and Teachers' Motivating and Demotivating Styles: A Self-Determination Theory Perspective</i> Huhtiniemi, M., Jaakkola, T., & Watt, A.
• <i>University Students' Perceptions of the Spectrum of Teaching Styles in Physical Education after an Escape Room-Based Intervention</i> Fernández-Rivas, M., & López-Sánchez, A., Martínez-Majolero, V. & Calero- Cano, José C.
• <i>The Teaching Style Toolbox: Pick the Right Tool at the Right Time</i> Mackinney, R.
• <i>Understanding How Student Teachers Approach the Spectrum: A Cluster-Analytic Examination of Motivation and Style-Specific Beliefs</i> Syrmpas, I. K., Krommydas, C., Gorozidis, G. S., & Digelidis, N.

Spectrum of Teaching Styles and Teachers' Motivating and Demotivating Styles: A Self-Determination Theory Perspective

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Research on spectrum of teaching styles has focused on teachers' self-reported use and perceived benefits of different approaches. However, relatively little is known about how these teaching styles are associated with teachers' motivating and demotivating styles as conceptualized in self-determination theory. The present study aims to address this gap by examining the links between Finnish physical education teachers' reported use of teaching styles and their motivating and demotivating practices in classroom situations.

Data will be collected in early 2026 from approximately 300 Finnish physical education teachers across primary and secondary school levels. The survey includes (a) items on teachers' demographic and professional background, (b) a validated questionnaire on Mosston and Ashworth's teaching styles, and (c) the Situations-in-School scale to capture motivating and demotivating styles (autonomy-support, structure, control and chaos). Statistical analyses will explore associations between teaching styles and motivational approaches using structural equation modelling (SEM). The results are ready to be presented at the time of the conference.

The study is expected to provide novel insights into how pedagogical choices in physical education are connected with motivational teaching practices. Findings will contribute to both spectrum theory and motivational frameworks, and offer practical implications for teacher education and professional development aiming to foster autonomy-supportive and student-centered learning environments.

Keywords: teaching styles, motivation, autonomy-supportive, practice, Finland

University Students' Perceptions of the Spectrum of Teaching Styles in Physical Education after an Escape Room-Based Intervention

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This study aimed to analyse whether there was an improvement in university students' perceptions of teaching styles in Physical Education following a gamification-based intervention implemented through an Escape Room. A quasi-experimental design with pre- and post-test measures was applied, consisting of three phases: (1) a theoretical session on the Spectrum of Teaching Styles, (2) a workshop in which the students experienced motor activities and games applying different teaching styles, and (3) an Escape Room session where the students reviewed the previously acquired knowledge. The Escape Room incorporated motivational elements such as AI-generated videos, question flashcards and digital locks and codes to progress to higher levels and overcome challenges, framed within gamification and challenge-based learning.

The sample comprised 44 university students (70.5% women and 29.5% men) enrolled in the Degree in Primary Education (45.5%), the Double Degree in Primary and Early Childhood Education (36.4%), and the Double Degree in Physical Activity and Sport Sciences and Primary Education (18.1%). Data were collected using the Spanish version of the Physical Education Students' Experiences and Perceptions of the Spectrum of Teaching Styles Questionnaire. Descriptive analyses were conducted using SPSS software.

The results revealed a general improvement in the students' perceptions of most teaching styles after the intervention. The highest-rated styles (such as "sometimes/almost always") were the command style A, practice style B, self-check style D and divergent discovery style H. In addition, almost all of them increased after the intervention: the command style A: pre= 3.27 ± 0.66 ; post= 3.59 ± 0.69 ; self-check style D: pre= 3.2 ± 0.80 ; post= 3.41 ± 0.73 ; and divergent discovery style H: pre= 3.41 ± 0.82 ; post= 3.61 ± 0.87 . Only the practice style A (pre= 3.61 ± 0.78 ; post= 3.41 ± 0.66) decreased slightly. The teaching styles with the lowest scores (such as "never/ almost never") were the reciprocal style C, inclusion style E, guided discovery style F and convergent discovery style G. Despite this, after the intervention, the students' perceptions of the application of most of these styles improved: the reciprocal style C (pre= 2.32 ± 0.67 ; post= 2.52 ± 0.85), guided discovery style F (pre= 2.7 ± 0.77 ; post= 2.89 ± 0.84) and convergent discovery style G (pre= 2.68 ± 0.93 ; post= 2.98 ± 0.85). Only the inclusion style E decreased its scores (pre= 2.95 ± 0.91 ; post= 2.89 ± 0.78).

In conclusion, the gamification-based intervention, using an Escape Room as a tool, generally improved the university students' perceptions of the use of different teaching styles. However, it would be advisable for future studies to further explore whether the use of active

methodologies is the main explanatory factor for this improvement and to analyse other aspects related to the perception of the Spectrum of Teaching Styles in university teacher education.

Keywords: gamification, teacher education, escape room learning, perceptions, teaching styles

The Teaching Style Toolbox: Pick the right tool at the right time

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A single teaching style cannot accommodate the diverse needs of all learners, who bring varied interests, preferences, and levels of developmental readiness (Hewitt, 2020). Mosston and Ashworth's *Spectrum of Teaching Styles* (2008) provides a structured yet flexible framework for aligning pedagogy with curriculum goals and learner diversity. It highlights the importance of context specific decision making, enabling teachers to select and adapt styles according to developmental readiness, task complexity, and social dynamics (Pill et al., 2023).

Although command and practice styles remain the most used styles in physical education (Chatoupis, 2018), an overreliance on reproduction styles limits opportunities for deeper learning and creativity. Teachers often encounter barriers to adopting production styles, including low confidence, concerns about supporting diverse learner needs, uncertainty in managing open ended tasks, and limitations in time, resources, and institutional support. This paper aims to address these challenges by offering practical strategies that help PE teachers adapt and integrate the full spectrum of styles to meet individual learner needs effectively. For each style, it identifies key teacher and learner behaviours, offers concrete teaching examples, and suggests implementation strategies tailored for diverse contexts. Designed as a quick-reference tool, it supports lesson planning and adaptation, helping teachers make informed decisions about when and how to use each style effectively.

By addressing these barriers, this paper equips physical education teachers with the tools to move beyond a narrow reliance on reproduction styles. It reframes the question from “*Which style is best?*” to “*What does this learner need right now?*”, promoting inclusive, meaningful experiences. Through advocating a responsive, hybrid approach, the paper supports educators in personalising learning, fostering engagement, and promoting holistic development across all domains.

Keywords: differentiated instruction, physical education, teaching styles, pedagogical strategies

Understanding How Student Teachers Approach the Spectrum: A Cluster-Analytic Examination of Motivation and Style-Specific Beliefs

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Effective teaching in physical education (PE) requires flexible pedagogical decision-making across Mosston and Ashworth's Spectrum of Teaching Styles, moving beyond a simple reproductive-productive binary. This study adopted a person-centered approach to examine how PE student teachers' pedagogical orientations intersect with their motivational belief structures, grounded in Expectancy-Value Theory (EVT). Participants were 147 physical education (PE) student teachers, completing Mosston and Ashworth's Spectrum of Teaching Styles questionnaire (Cothran et al., 2000) and Garn et al. (2024) expectancy-value-cost (EVC) instrument.

A confirmatory factor analysis (CFA) was conducted to evaluate the hypothesised three-factor structure of the EVC model. The model demonstrated acceptable overall fit to the data, χ^2 (132) = 230.39, $p < .001$, CMIN/df = 1.75, NFI = .856, RFI = .834, IFI = .933, TLI = .921, CFI = .932, RMSEA = .071, SRMR = .070. Internal consistency was high across all subscales (Expectancy $\alpha = .881$, Value $\alpha = .903$, Cost $\alpha = .872$). A two stage cluster analysis (Ward's method followed by k means) identified four distinct instructional profiles among PE student teachers: a Versatile profile ($n = 61$; 41.5%), a Low Involvement profile ($n = 40$; 27.2%), a Direct & Student Assessment profile ($n = 24$; 16.3%), and a Student Initiated profile ($n = 22$; 15.0%). These clusters differed significantly across 13 of 14 pedagogical and motivational variables, revealing meaningful configurations of perceived benefits, autonomy orientation, expectancy beliefs, and perceived cost. The final k means centroids closely reproduced the hierarchical seeds (82.6% retention), and split sample validation yielded 70.7% concordance, supporting replicability.

The results suggest that PE student teachers' teaching preferences are deeply rooted in a complex interplay of expectancy, value, and perceived cost rather than just content knowledge. These findings advocate for differentiated Physical Education Teacher Education programs should focus on differentiated mentoring, addressing the perceived "costs" of student-centered instruction, and providing well-structured mastery experiences across the full Spectrum of Teaching styles to counteract the persistent influence of prior reproductive-style acculturation.

Keywords: teaching styles, expectancy-value-cost model, student teachers, pedagogical beliefs

Session 6 – Oral Presentations: Context, Inclusion, Justice, and Future Directions

Chair/Discussant: Feng-Min Wei

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|---|
| <ul style="list-style-type: none">• <i>Teaching for Social Justice: The Impact of the Spectrum of Teaching Styles on In-Service PE Teachers' Practices and Perspectives</i>
Haneishi, K., Okade, Y., Murai, R., Ito, M., Fuchikami, M., Matsumoto, T., Murakami, T., Nakayama, S., Ogiwara, T., Teraoka, E., Tsuda, E., Curtner-Smith, M., & Nkala, B. |
| <ul style="list-style-type: none">• <i>Fostering Social Justice and Inclusion in PE: Pedagogical Strategies for Today's Polarized Society</i>
Haneishi, K., Okade, Y., Murai, R., Ito, M., Fuchikami, M., Matsumoto, T., Murakami, T., Nakayama, S., Ogiwara, T., Teraoka, E., Tsuda, E., Curtner-Smith, M., & Nkala, B. |
| <ul style="list-style-type: none">• <i>Different versions of Learning: How Assessment for Learning Shapes Learner Independence within Mosston's Spectrum of Teaching Styles</i>
Yang, H. W., & Shy, D. Y. |
| <ul style="list-style-type: none">• <i>Shifts in Teaching Styles During Periods of Pedagogical Disruption or environmental constraints</i>
Bertollo, M., & Hamdi, F. |

Teaching for Social Justice: The Impact of the Spectrum of Teaching Styles on In-Service PE Teachers' Practices and Perspectives

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This ongoing research project examines how the Spectrum of Teaching Styles (Mosston & Ashworth, 2008) can reshape the practices and perspectives of in-service physical education (PE) teachers in Japan, with a strong focus on advancing diversity, inclusion, and social justice. In an era of global polarization and heightened calls for equitable education, this study explores how intentional pedagogical strategies can empower teachers as agents of social change.

Nine in-service PE teachers are engaged in a structured professional development program totaling ten hours. The program includes six hours of online lectures (four sessions, 1.5 hours each) featuring interactive presentations, group discussions, and reflective activities, followed by a four-hour in-person workshop with demonstrations of teaching episodes and collaborative lesson planning. This training equips teachers with practical tools to implement student-centered, inclusive pedagogies that foster personal and social skill development through the lens of equity and justice.

After completing the training, each teacher designs and delivers a unit of at least eight lessons incorporating multiple Spectrum teaching styles aligned with their curriculum. Lesson plans undergo review and refinement with Spectrum experts to ensure fidelity. Classroom implementation is also observed to provide detailed insights into shifts in instructional practices and classroom dynamics. To capture evolving teacher perspectives, three semi-structured interviews are conducted at key stages:

- Pre-training: Assessing prior knowledge of the Spectrum and approaches to teaching social skills.
- Post-training/pre-implementation: Exploring training experiences and anticipated impacts on student learning.
- Post-implementation: Reflecting on changes in teaching practice, student outcomes, and professional growth.

Additional qualitative data include teacher reflections, informal member checks, and ongoing dialogue with Spectrum experts. These sources are triangulated with observation data to build a comprehensive understanding of the Spectrum's impact on teacher development and instructional change.

This presentation will share preliminary findings on professional growth, observed shifts in classroom climate, and strategies teachers employ to overcome barriers to inclusive PE

instruction. By presenting these early results, the study highlights the potential of the Spectrum of Teaching Styles to support PE teachers in creating equitable, socially just learning environments.

Collaborating University Scholars: Eishin Teraoka, Nippon Sport Science University, Risako Murai, Tokai University, Tomoko Ogiwara, Juntendo University, Daiki Murakami, Seinan Gakuin University, Saori Nakayama, University of Tsukuba, Emi Tsuda, West Virginia University, and Maho Fuchikami, Mejiro University.

Keywords: Spectrum-based professional development, inclusive, physical education, teacher learning, pedagogical change

Fostering Social Justice and Inclusion in PE: Pedagogical Strategies for Today's Polarized Society

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Over recent decades, scholars have stressed the need for pedagogical strategies that promote inclusion and address systemic inequities (Giroux, 2021; Kanpol, 1999; Kincheloe, 2008). In physical education (PE), calls for approaches prioritizing diversity, inclusion, and social justice challenge traditional, exclusionary curricula (Block et al., 2021; Culp, 2021). Yet research shows PE often reinforces gendered, racialized, and ableist norms (Fernandez-Balboa, 1993; Lynch & Curtner-Smith, 2019), underscoring the need for socially just practices (Evans & Davies, 2015; Williams & Pill, 2019).

Polarization is evident globally. In the U.S., recent federal actions have dismantled DEI programs, restricted instruction on race and gender, and targeted transgender students' rights, sparking protests and legal challenges. Similarly, before the World Athletics Championships in Tokyo, mandatory genetic testing for female athletes drew criticism for discrimination and privacy concerns. Meanwhile, today's youth grow up immersed in technology, limiting face-to-face interaction and social skill development. Teaching empathy, teamwork, and conflict resolution is more critical than ever.

The Spectrum of Teaching Styles (Mosston & Ashworth, 2008) offers a framework for embedding diversity, inclusion, and social justice in PE. Its eleven styles foster autonomy, reflection, and social interaction, which are critical to inclusive, student-centered learning. Student-activated styles like Reciprocal style C, self-check style D, and guided discovery style F enhance motivation and cognitive/social skills (Byra & Jenkins, 1999; Chatzipanteli et al., 2015). Inclusion (Style E) and Reciprocal (Style C) styles promote responsibility, cooperation, and effective feedback (Byra & Marks, 1993). Our research shows PETE scholars and teachers value the Spectrum for advancing Justice, Equity, Diversity, and Inclusion (JEDI) and social skills (Authors, 2023), with promising impacts on student behavior and teacher development (Authors, 2024).

This presentation combines critical and transformative pedagogies (Giroux, 2021; Kanpol, 1999) with the Spectrum, viewing education as a tool for social change through dialogue, reflection, and student agency (Freire, 1970). Developmental Channels within the Spectrum guide growth in independence, empathy, and communication (Mosston & Ashworth, 2008; Ashworth, 2019). In a polarized, digital world, strategies fostering inclusion, empathy, and critical thinking are essential. The Spectrum provides a pathway to build equitable, socially just learning environments in PE.

Collaborating University Scholars:

Eishin Teraoka, Nippon Sport Science University (Japan), Risako Murai, Tokai University (Japan), Tomoko Ogiwara, Juntendo University (Japan), Daiki Murakami, Seinan Gakuin University (Japan), Saori Nakayama, University of Tsukuba (Japan), Emi Tsuda, West Virginia University (USA), and Maho Fuchikami, Mejiro University (Japan).

Keywords: teaching styles, social justice, physical education, inclusive pedagogy

Different versions of Learning: How Assessment for Learning Shapes Learner Independence within Mosston's Spectrum of Teaching Styles

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The core premise of Mosston's Spectrum views teaching as a sequence of decision-making processes. According to Mosston, when teachers gradually transfer decision-making authority to students, learners can be guided toward becoming independent (Mosston & Ashworth, 2008). However, there remains a lack of empirical evidence explaining the mechanisms through which individuals develop such independence via decision-making. From the perspective of Assessment for Learning (AfL), decision-making reflects the learner's process of understanding their current status and determining the next steps in their learning (William, 2011). Yet, as the source of goal-setting and feedback varies—whether from the teacher, peers, or the learners—different forms of learning and educational outcomes may emerge. AfL thus provides a valuable lens to examine how learners develop independence through active participation in decision-making. Guided by the AfL perspective, this study investigated the variations in learning versions and outcomes when Mosston's Spectrum of Teaching Styles was applied in two Sport Education (SE) badminton courses in Taiwan. A qualitative research design was employed across two semester-long courses, involving one instructor and 100 undergraduate students. Data were collected from multiple sources, including student interviews, teacher reflection journals, student reflection journals, and learning portfolios. Thematic analysis was conducted to identify core themes of the learning experience across the SE seasons, followed by constant comparison to examine the diverse learning patterns throughout the 16-week semester. The findings revealed two distinct versions of learning. In lessons dominated by teaching styles from the Reproduction Cluster, both teacher and students relied on criteria defined by the teacher. Students aligned their performance with the teacher's expectations, often viewing them as a route to higher grades—an approach described as “AfL for external standards.” In contrast, lessons emphasizing teaching styles from the Production Cluster allowed learners to generate goals through self-regulation or team negotiation. In this context, standards became diverse and open-ended, promoting more individualized learning—a pattern termed “AfL for self-development.” Engagement in AfL for self-development enabled students to construct deeper meanings and understanding of their learning. This study demonstrates that the journey toward independent learning can involve diverse versions and outcomes, shaped by the sources of goal-setting and the learning context. The findings suggest that these interactions influence learners' paths to independence, and future research could examine more closely the timing and conditions under which learners transition toward independence.

Keywords: assessment for learning, badminton, higher education

Shifts in Teaching Styles During Periods of Pedagogical Disruption or environmental constraints

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Teaching styles represent a core dimension of pedagogical decision-making in Physical Education (PE). According to the Spectrum of Teaching Styles proposed by Mosston and Ashworth (2008), teaching approaches range along a continuum from teacher-centred, reproductive styles (e.g., command and practice) to student-centred, productive styles (e.g., guided discovery and problem solving). Each style reflects different distributions of decision-making between teacher and learner. PE teachers need to be flexible in their approach and teaching style, particularly when the circumstances and the environmental constraints require a modification. For instance, the COVID-19 pandemic and the consequent school lockdowns forced PE teachers to redesign their instructional practices, potentially affecting their position along this spectrum. The aim of this study was to investigate whether an exceptional event such as the COVID-19 lockdown compelled PE teachers to change their teaching styles.

Participants included 195 in-service PE teachers (Mage = 50.2 years, SD = 12.8; 61% female, 39% male), with teaching experience ranging from 1 to 43 years (M = 17.6, SD = 13.4). Teachers taught across middle schools (28.7%), high schools (62.6%), or a combination of levels (8.7%). In a self-report survey, teachers identified their primary teaching styles both before and during the period of social containment. Styles were coded according to Mosston's framework and analysed to create a composite score reflecting the proportion of student-centered (non-directive) methods used.

Most teachers reported having modified their teaching style during the lockdown period. A paired samples t-test was conducted for the subgroup of teachers (n = 152, 77.9%) who reported intentionally modifying their style. Results indicated a statistically significant decrease in the use of directive styles during the lockdown (M = 1.32, SD = 1.00) compared to the pre-pandemic period (M = 1.85, SD = 1.29), $t(151) = 5.2$, $p < .001$.

This suggests that the COVID-19 lockdown acted as a catalyst for pedagogical change, driving a significant portion of PE teachers towards more student-centered, non-directive approaches on Mosston's spectrum. The findings highlight the adaptive capacity of educators and the influence of contextual crisis on teaching practices, underscoring a potential long-term transformation in instructional strategies within physical education. *Keywords:* teaching style change, COVID-19 lockdown, adaptive pedagogy, student-centred

Roundtable 2. The Institute and its Mission: Our Challenges and Aspirations for the Coming Years

Co-Ordinators: Digelidis N., Byra M., Espada M., Shy D.-Y., Wei F.-M.

SITL Board of Directors

The Spectrum Institute for Teaching and Learning (SITL) is a non-profit organization founded through the generous gift of Sara Ashworth and supported by the Lankler Family Foundation. Its mission is to promote, enhance, and disseminate the Spectrum of Teaching Styles, serving as a global center for teachers, coaches, teacher educators, scholars, and curriculum developers committed to advancing the art and science of teaching and learning.

This roundtable presentation offers a comprehensive overview of the Institute's current, developing, and future initiatives. Ongoing programs include a virtual Workshop Series, the Spectrum Roundtable Conversation, annual Outstanding Journal Publication Awards, a Research Grant Award Program (ranging from \$5,000–\$25,000), mini-grants supporting conference presentations and videotaped Spectrum episodes, a free 12-course MOOC curriculum in English, the Sara Ashworth Graduate Student Assistantship-Scholarship Awards, and support for doctoral students through the AIESEP PhD Summer School Program.

Developing initiatives include an edited scholarly volume integrating Spectrum theory across contemporary domains of sport pedagogy and physical education teacher education (PETE), expanded videotaped episode awards addressing combined styles and design variations, and multilingual translations of the MOOC courses and the foundational Mosston & Ashworth text *Teaching Physical Education* (2008).

Looking ahead, the SITL envisions an intensive graduate residency program, large-scale international research grants of up to \$200,000, and a dedicated Spectrum Institute website to bring together all the initiatives. The session concludes with an open invitation for conference participants to propose new initiatives, reflecting the Institute's commitment to collaborative, community-driven growth.

Useful links

Official website for the Spectrum of Teaching Styles and SITL initiatives:
<https://spectrumofteachingstyles.org/>

Educational curriculum in English: <https://spectrumofteachingstyles.online/>

Educational curriculum in Spanish: <https://spectrumofteachingstyles.es/>

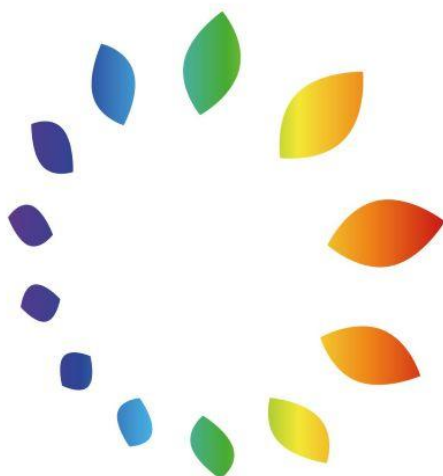
Official Facebook page:
<https://www.facebook.com/thespectrumofteachingstyles>

Official YouTube page: <https://www.youtube.com/user/SpectrumStyles>

Official LinkedIn page: <https://www.linkedin.com/company/spectrum-institute-for-teaching-and-learning/>

Official X account: <https://x.com/spectrumots>

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