

Designing Inclusive Table Tennis Education for University Students with and Without Disabilities: A TPSR-Informed Framework Centered on Responsibility, Respect, and Belonging

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ABSTRACT:

University physical education (PE) can promote not only physical skills and health but also responsibility, respect, cooperation, and social inclusion. However, students with disabilities may remain marginalized from meaningful practice, peer interaction, decision-making, and valued roles even in shared classes. This paper develops a provisional inclusive table tennis education framework for university students with and without disabilities. Using a theory- and practice-oriented conceptual framework design, literature on Teaching Personal and Social Responsibility (TPSR), disability-inclusive physical education, differentiated instruction, Universal Design for Learning, cooperative learning, and table tennis pedagogy was purposefully integrated through conceptual mapping. The framework comprises six interdependent curriculum dimensions-respect, responsibility, cooperation, inclusive participation, belonging, and transfer-and a five-phase lesson cycle: relational opening, responsibility awareness, differentiated skill practice, cooperative application, and reflection/transfer. It also distinguishes curriculum dimensions from proposed empirical outcomes and outlines a staged validation pathway. Inclusion is conceptualized as meaningful participation, agency, valued contribution, and belonging rather than physical co-location alone. The TPSR-informed framework requires co-design, expert review, feasibility testing, and controlled evaluation before effectiveness can be established.

Keywords: disability-inclusive physical education, table tennis, Teaching Personal and Social Responsibility (TPSR), belonging, university students

Introduction

Physical education (PE) has long been valued not only for its capacity to develop physical competence and promote health, but also for its potential to support affective, social, and cognitive development. These outcomes, however, do not arise automatically from

participation in physical activity. The pedagogical design of the learning environment, the quality of teacher-student relationships, and the ways students interact with one another substantially shape what they learn through physical activity (UNESCO, 2015). This point is particularly important in university PE, where students enter compulsory or elective courses with considerable

differences in prior sport experience, physical ability, confidence, disability status, health conditions, and expectations for participation.

Inclusive education requires far more than providing students with physical access to a classroom. In PE, students may occupy the same space yet remain marginalized from meaningful learning, peer interaction, or decision-making. Research on inclusive PE has repeatedly identified barriers such as inadequate teacher preparation, inflexible curricula, peer attitudes, inaccessible equipment and environments, assumptions about “normal” ability, and limited opportunities for genuine social participation (Block & Obrusnikova, 2007; Haeghele et al., 2018; Pocock & Miyahara, 2018; Qi & Ha, 2012; Rekaa et al., 2019; Tant & Watelain, 2016). Students with disabilities tend to report more positive experiences when they feel competent, accepted, and recognized as members of the group, whereas restricted participation or having their competence questioned can contribute to experiences of exclusion (Alves & Duarte, 2014; Goodwin & Watkinson, 2000). In university contexts, barriers to physical activity and sport participation also include environmental accessibility, institutional arrangements, the availability of appropriate support, and whether courses or programs are genuinely designed from disability-inclusive perspectives (Úbeda-Colomer et al., 2019; Yermakova & Jagiello, 2026).

At the same time, PE provides a distinctive context for explicitly teaching personal and social responsibility. Hellison’s Teaching Personal and Social Responsibility (TPSR) model was developed to move PE beyond a narrow focus on sport technique by making respect, effort, self-direction, caring, leadership, and transfer visible learning goals (Hellison, 2011; Richards & Shiver, 2020). Systematic reviews and meta-analyses suggest that well-implemented TPSR programs can support personal and social responsibility and a range of social-emotional outcomes, although effects vary across contexts and more rigorously designed controlled studies are still needed (Aygun et al., 2024; Pozo et al., 2018; Sánchez-Miguel et al., 2025). Recent scholarship has also extended TPSR toward a social justice

orientation, asking teachers to attend to inequality, power, student voice, and advocacy rather than treating responsibility solely as individual behavior management (Baker et al., 2023; Scanlon et al., 2024; Scanlon et al., 2025).

Table tennis offers a particularly useful, bounded context in which responsibility education and disability-inclusive pedagogy can be integrated. Teachers can rapidly adjust task demands by changing practice distance, ball type, speed, target area, bounce rules, scoring, or partner roles, allowing students to pursue common learning goals through different participation pathways. Technical learning in table tennis is also highly partner-dependent: in many beginner and intermediate tasks, one student’s opportunity for effective practice depends on whether the partner can return a controllable ball and interact constructively. At the same time, rally length, errors, and scores make differences in ability highly visible, creating genuine inclusion challenges when skill differences become status differences. Through individual practice, paired work, doubles, officiating, and group roles, table tennis can therefore connect technical progression with responsibility, reciprocity, and belonging (Guillou & Durny, 2008; Tang et al., 2026; Teraoka & Yotsumoto, 2024). These characteristics are not unique to table tennis, but they make it a valuable sport-specific case for translating broad principles of inclusion into everyday pedagogical decisions.

The framework responds to four main gaps. First, TPSR and disability-inclusive PE have often developed as parallel strands, with limited guidance on how responsibility education and inclusive education can be enacted together within a specific sport. Second, inclusion is sometimes reduced to access or task modification, with insufficient attention to reciprocal respect, valued contribution, agency, and belonging. Third, when university table tennis courses are organized primarily around skill acquisition and performance assessment, social and inclusive goals may remain implicit rather than being planned as learning outcomes. Fourth, disability-inclusive PE frameworks often remain at the level of general pedagogical

principles and provide limited sport-specific guidance on task design, peer interaction, competition, assessment, and student roles. A recent IJSE review synthesized UDL, differentiation, technology, and participation in inclusive and adaptive PE (Peng et al., 2026). Within the literature assembled for the present conceptual synthesis, direct empirical work on disability-inclusive university table tennis is especially limited. The present paper therefore addresses a distinct gap by integrating TPSR-informed responsibility education with disability-inclusive pedagogy and translating both into a university table tennis teaching architecture.

Accordingly, this paper aims to develop a researcher-generated, provisional, practice-oriented framework for inclusive university table tennis that supports meaningful participation by students with and without disabilities while explicitly positioning responsibility, respect, and belonging as curriculum goals. The framework is presented as an internally coherent and testable pedagogical design proposition, not as evidence that these practices are already effective or as a framework that has already been validated with students with disabilities.

1.1 Theoretical and Conceptual Foundations

1.1.1 *Teaching Personal and Social Responsibility*

TPSR treats personal and social development as explicit educational content rather than as an incidental outcome that naturally follows from sport participation. The model emphasizes respect, participation and effort, self-direction, helping and leadership, and transfer of responsibility beyond the activity setting (Hellison, 2011). It is strongly relational: teachers are expected to know their students, share responsibility, create meaningful opportunities for choice and leadership, and promote learning through reflection rather than simply rewarding compliance.

Implementation fidelity is important. Merely using the language of “responsibility” does not constitute TPSR; authentic TPSR requires observable teaching strategies, student voice, meaningful assumption of responsibility, and

opportunities for reflection (Escartí et al., 2018; Wright & Craig, 2011). Professional learning for teachers is therefore important (Dunn & Doolittle, 2020), and transfer of responsibility should be taught intentionally rather than assumed to occur automatically (Gordon & Doyle, 2015; Gordon et al., 2016; Jacobs et al., 2022).

In table tennis classes, respect and responsibility can be embedded in everyday behaviors such as returning equipment, serving legally, accepting officiating decisions, adjusting rally pace to a partner’s needs, providing constructive feedback, and jointly managing learning tasks. Responsibility-based teaching can also address moral disengagement and unfair conduct directly rather than treating them solely as disciplinary problems (Hsu et al., 2022).

1.1.2 *Inclusive Pedagogy, Differentiated Instruction, and Belonging*

Inclusive PE requires more than “sharing the same physical space.” Students should be able to participate meaningfully, learn, interact, make choices, and experience a sense of personal value. Reviews have repeatedly identified tensions between inclusive ideals and classroom realities, including teacher preparation, curriculum design, peer relationships, and pedagogical adaptation (Block et al., 2021; Rekaa et al., 2019; Tant & Watelain, 2016). Student experience is especially important because a setting that appears inclusive to adults may still be experienced as isolating by students; belonging, meaningful engagement in skill learning, and perceived competence are therefore important indicators of inclusion (Alves & Duarte, 2014; Goodwin & Watkinson, 2000).

Universal Design for Learning (UDL) and differentiated instruction advocate multiple ways for students to engage with tasks, access information, and demonstrate learning, with task constraints and support conditions adjusted as needed (Gilbert, 2019; van Munster et al., 2019). The Inclusion Spectrum and peer-mediated instruction likewise emphasize diverse forms of instructional organization and social support (Grenier et al., 2017; Klavina, 2008). Cooperative

learning provides a complementary basis for structuring positive interdependence, reciprocal support, and individual accountability in PE (Dyson & Casey, 2012). These approaches provide useful resources for planning, but recent reviews caution against assuming that UDL alone can guarantee inclusion or completely replace the need for individualized adaptations (Haegele et al., 2024; Lourenço et al., 2025).

In this paper, belonging is treated as a qualitative indicator of inclusion rather than as a synonym for attendance. Belonging emerges when the learning environment communicates that “you are a legitimate and important member of this group, and your contribution and progress matter.” When activities are organized primarily through individualized arrangements or continually foreground difference, interaction between students with and without disabilities may remain limited (Qi & Wang, 2018). Peer attitudes likewise influence whether inclusion becomes reciprocal participation or remains mere physical co-location (Li et al., 2022).

1.1.3 A Social Justice-Oriented View of Inclusive Responsibility

Responsibility can be narrowly interpreted as self-control and rule compliance, yet students may comply superficially while continuing to exclude others through ability-based ridicule, unequal distribution of opportunities, or excessive helping. Social justice-oriented PE emphasizes equity, critical reflection on marginalization, and action to improve participation (Gerdin et al., 2021; Philpot et al., 2021). A socially just approach to TPSR similarly links responsibility with student voice, fairness, advocacy, and attention to ableism and other forms of inequality (Baker et al., 2023; Scanlon et al., 2024).

Equity therefore does not mean that every student must complete exactly the same task, move at the same speed, or meet the same performance threshold. Equitable participation means that students can access versions of tasks with equivalent learning value, experience appropriate challenge and opportunities to contribute, understand transparent assessment

criteria, and receive individualized support when needed. This interpretation is consistent with rights-based approaches to inclusive education and principles of quality physical education (United Nations, 2006; UNESCO, 2015).

1.2 Research Aim and Guiding Questions

1. How can TPSR-informed responsibility education and disability-inclusive pedagogy be integrated into university table tennis while preserving technical learning as an explicit curriculum goal and supporting meaningful participation for students with and without disabilities?
2. Which pedagogical elements can operationalize responsibility, respect, cooperation, meaningful participation, agency, belonging, and individualized support in routine table tennis lessons?
3. How should future empirical studies evaluate the feasibility, implementation fidelity, acceptability, and educational outcomes of the framework?

2. Methodology

2.1 Research Design

This study adopted a theory- and practice-oriented conceptual framework development design. Its purpose was not to estimate intervention effects or make statistical inferences, but to translate existing theory and research evidence on responsibility education and disability-inclusive pedagogy into a pedagogical structure that can be implemented and tested in university table tennis. The framework should therefore be understood as a researcher-generated conceptual proposition. Because the study involved no newly recruited human participants, experimental samples, or new data collection, no participant/sample section or empirical measurement instruments were required. The study materials consisted of published literature and the theoretical constructs, pedagogical principles, student-experience evidence, and practice-based evidence within that literature that were relevant to framework development.

2.2 Sources and Selection of Conceptual Evidence

Conceptual evidence was assembled purposefully and iteratively from foundational theoretical sources, recent reviews, empirical studies, student-experience research, and sport-specific pedagogical literature. Four evidence domains were identified a priori: (a) TPSR and responsibility-based teaching; (b) disability-inclusive and adapted physical education, including research on students' lived and classroom experiences; (c) UDL, differentiated instruction, cooperative learning, and models-based practice; and (d) table tennis pedagogy. Sources were prioritized when they met one or more framework-development functions: defining or refining a core construct; synthesizing or empirically examining an inclusion barrier or student experience; describing a pedagogical practice that could be translated into an observable teaching decision; or providing higher-education or disability-specific evidence relevant to the proposed context. Student-experience studies were given particular interpretive weight when defining belonging, agency, exclusion, and the risks of over-helping or social isolation. For framework construction, sources that merely duplicated an already represented construct without adding a distinct pedagogical implication, remained too remote from PE to inform teaching decisions, or could not be translated into an observable design principle were not used to define an additional framework dimension. The paper does not claim exhaustive database coverage, PRISMA-style screening, meta-analytic inference, or saturation;

its purpose is transparent conceptual integration rather than comprehensive evidence enumeration.

2.3 Framework Development and Conceptual Mapping

Framework development followed six linked analytic steps. First, candidate constructs were extracted from the four a priori evidence domains. Second, each construct was linked to a specific inclusion or relational challenge in PE. Third, the construct was translated into a table-tennis teaching decision involving task design, peer interaction, roles, competition, assessment, or adaptation. Fourth, an observable implementation indicator was specified so that the construct could be recognized in practice. Fifth, candidate constructs were compared for conceptual overlap and pedagogical function; overlapping constructs were merged when they represented the same instructional purpose, whereas conceptually distinct constructs were retained separately. Sixth, only constructs that satisfied the refinement criteria described below were retained in the provisional framework. This mapping was used as an interpretive framework-development procedure rather than as a reliability-coded content analysis. Table 1 summarizes how the principal conceptual evidence domains contributed to the six retained dimensions. Detailed pedagogical practices, observable implementation indicators, and disability-inclusive design considerations are presented separately in Table 2 so that the derivation of the framework is distinguished from its classroom operationalization.

Table 1. Conceptual Evidence-to-Dimension Mapping for the Provisional Framework

Conceptual evidence domain	Retained framework dimension	Distinct contribution to the framework
TPSR: respect	Respect	Establishes dignity, fair treatment, relational norms, and respect for students' stated support preferences.
TPSR: responsibility and self-direction	Responsibility	Extends responsibility from compliance toward self-direction, meaningful choice, role ownership, and shared responsibility for the learning environment.
Cooperative learning and peer mediation	Cooperation	Frames peer interaction as reciprocal interdependence rather than one-way assistance or fixed helper-recipient relationships.

Conceptual evidence domain	Retained framework dimension	Distinct contribution to the framework
Inclusive PE, UDL, and differentiated instruction	Inclusive participation	Supports multiple participation pathways toward shared learning goals while retaining individualized adaptation when required.
Student-experience and belonging literature	Belonging	Positions legitimate membership, recognition, valued contribution, and protection from social isolation as indicators of meaningful inclusion.
TPSR transfer and social justice-oriented pedagogy	Transfer	Extends responsibility, equity, accessibility awareness, and inclusive action beyond the immediate table tennis lesson.

2.4 Analysis and Framework Refinement Principles

Framework refinement followed three criteria: conceptual distinctness, pedagogical necessity, and operationalizability. First, every social or inclusion-related objective had to be translatable into observable pedagogical practice rather than remain an abstract value. Second, social objectives had to be embedded within technical learning rather than added as separate instruction outside the sport curriculum. Third, flexible and broadly accessible design options had to coexist with individualized adaptations because some participation needs cannot be addressed through universal options alone. The six retained dimensions serve different functions. Respect concerns relational norms, dignity, and fair treatment; responsibility concerns self-direction and shared responsibility for the learning environment; cooperation concerns the interactional process through which peers create reciprocal learning opportunities; inclusive participation concerns access to meaningful practice through flexible participation pathways; belonging concerns the learner's experience of legitimate and valued membership; and transfer concerns extension of responsibility and inclusion beyond the immediate lesson. Agency was not retained as a separate dimension because it is treated as a cross-cutting property expressed through student voice, meaningful choice, role ownership, and negotiated adaptation across responsibility and inclusive participation. Technical progression likewise remains a co-primary sport-learning outcome rather than a social curriculum dimension. For framework-development purposes, conceptual sufficiency

was reached when each retained dimension could be linked to an established conceptual source, an identifiable inclusion challenge, a table-tennis pedagogical translation, and an observable implementation indicator. The resulting six dimensions and five-phase lesson structure therefore remain provisional and require co-design and empirical validation.

2.5 Scope and Reproducibility of the Conceptual Synthesis

Because this is a conceptual framework paper rather than a systematic review, reproducibility rests primarily on the explicit mapping and refinement logic rather than on a claim of exhaustive evidence capture. The paper does not infer effectiveness from the literature set, does not treat the six dimensions as statistically derived factors, and does not claim independent content validation at this stage. Table 1 makes the evidence-to-dimension derivation visible, Table 2 operationalizes the six dimensions through table-tennis practices and observable implementation indicators, and Table 5 specifies candidate evidence for their future empirical evaluation. Together, these components distinguish conceptual derivation, pedagogical operationalization, and empirical testing rather than treating them as equivalent forms of evidence. The framework should therefore be regarded as a researcher-generated provisional model that is sufficiently explicit to be challenged, co-designed, refined, and tested by future researchers and stakeholders, particularly students with disabilities.

3. Results

The direct output of this study is not an empirical effect estimate but a provisional pedagogical framework derived through conceptual mapping. The results consist of three linked components—framework dimensions, a lesson implementation structure, and an assessment/validation alignment—which respectively address what the framework proposes to teach, how teaching can be organized, and how implementation and student outcomes could later be examined empirically.

3.1 Provisional Inclusive Table Tennis Education Framework

The provisional framework comprises six interrelated dimensions: respect, responsibility,

cooperation, inclusive participation, belonging, and transfer. Respect and responsibility are informed directly by TPSR; cooperation and belonging represent distinct relational process and experience components of inclusion; inclusive participation operationalizes flexible participation pathways and individualized support; and transfer connects classroom learning with broader university and community life. These dimensions are proposed to operate interdependently, but that interdependence is a theoretical proposition to be tested rather than an established causal effect. Figure 1 therefore distinguishes the curriculum architecture from the empirical outcome domains proposed for future study.

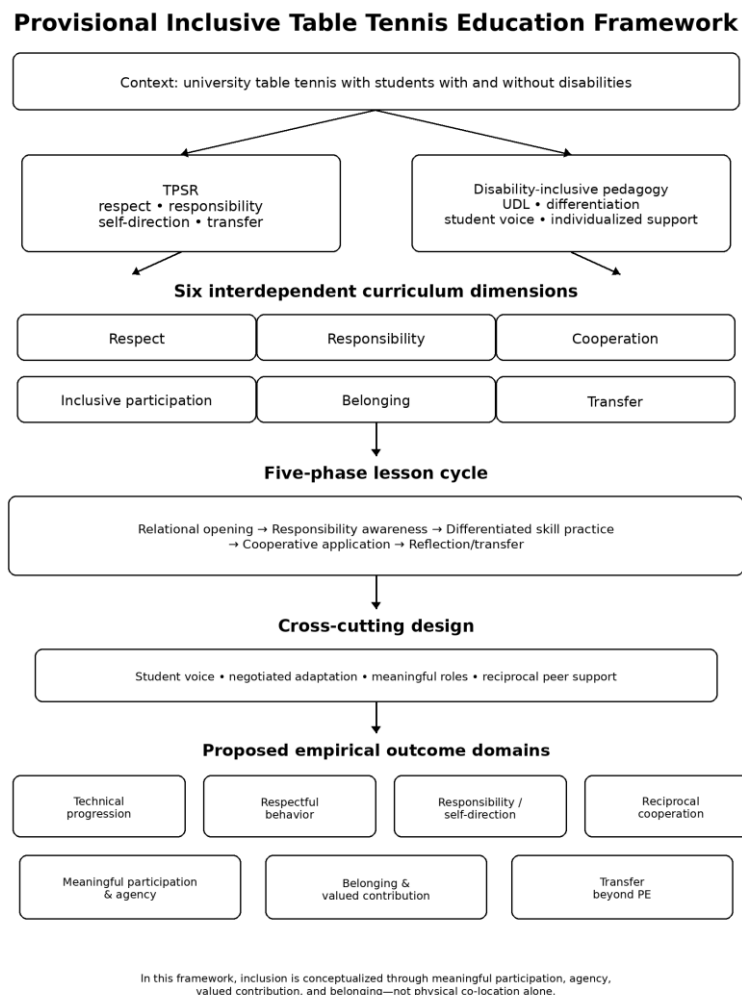


Figure 1. Conceptual Structure of the Provisional Inclusive Table Tennis Education Framework

Note. Student voice and negotiated individualized adaptation cut across all six curriculum dimensions and all five lesson phases. The outcome domains shown are proposed targets for future empirical testing and should not be interpreted as validated effects.

Table 2. Core Dimensions of the Provisional Inclusive Table Tennis Education Framework

Dimension	Pedagogical purpose	Table tennis practices	Observable indicators	Disability-inclusive design considerations
Respect	Protect others' rights, dignity, safety, and opportunities to learn.	Legal serving; fair scoring; match etiquette; constructive feedback; accepting officiating decisions; respecting students' requests for adaptations.	Students use respectful language, follow shared rules, respect opponents and partners, and resolve minor disagreements without humiliating others.	Respect each student's preferred forms of assistance, communication, and adaptation; avoid assumptions based on disability labels.
Responsibility	Develop self-management and responsibility for shared learning.	Student officiating; equipment and accessibility roles; personal goals; station management; rotating peer-coach roles; self-monitoring.	Students prepare appropriately, manage roles, pursue mutually agreed goals, care for equipment, and complete tasks without continuous teacher control.	Share responsibility for creating an accessible environment and ensure that students with disabilities also take on participation, leadership, and decision-making roles.
Cooperation	Create reciprocal interdependence rather than parallel but separate participation.	Cooperative rally goals; paired problem solving; doubles communication; reciprocal peer feedback; mixed-role teams.	Partners exchange useful feedback, adjust returns to sustain practice, distribute roles, and promote one another's progress.	Use reciprocal peer support; avoid permanent "helper-recipient" roles, excessive helping, or practices that reduce agency.
Inclusive participation	Provide flexible pathways for meaningful participation in pursuit of a shared learning goal.	Tiered targets; adjustable distance and speed; larger/slower or higher-contrast balls when appropriate; additional bounce allowances; modified scoring; seated/standing options; alternative ways to demonstrate learning.	Students hold active participation roles, experience appropriate challenge, and demonstrate progress without unnecessary segregation.	Negotiate adaptations with students; preserve shared learning goals while providing individualized support when needed.
Belonging	Build acceptance, a sense of being valued, and legitimate membership in the learning community.	Stable but flexible groups; contribution-based roles; rotating leadership; cooperative goals before ranking; recognition of progress and supportive behavior.	Students feel valued, are selected by peers for participation, and make visible contributions rather than being left without meaningful roles.	Prevent social isolation and ability-based status hierarchies; ensure that students with disabilities are visible and valued contributors.
Transfer	Extend responsibility and inclusion beyond the class.	Closing reflection; action commitments; connecting fair officiating with academic teamwork; accessibility advocacy.	Students identify applications of responsibility or inclusion principles in study, work, residence life, clubs, or community settings.	Connect classroom experience with disability awareness, accessibility, and broader inclusive action across the university.

The six dimensions operate as interdependent features of the same pedagogical environment rather than as separate add-on objectives. Respect establishes relational norms; responsibility promotes self-direction and shared ownership; cooperation structures reciprocal

peer learning; inclusive participation provides flexible pathways toward shared learning goals; belonging concerns legitimate and valued membership; and transfer extends responsibility and inclusion beyond the lesson. Student voice and negotiated adaptation operate across these

dimensions rather than constituting separate curriculum domains.

In practice, technical and social learning are intentionally integrated. For example, a cooperative rally task can simultaneously develop ball control, reciprocal responsibility, appropriate task adjustment, and meaningful peer participation. The framework therefore does not require students to perform identical tasks; it requires learning opportunities through which students can participate meaningfully, contribute, retain agency, and demonstrate progress toward shared educational goals.

3.2 Five-Phase Lesson Structure and Curriculum Progression

To embed the six dimensions consistently in routine teaching, the framework adopts a five-

phase cycle: relational opening, responsibility awareness, differentiated skill practice, cooperative application, and reflection/transfer. This cycle is an adaptation informed by TPSR principles rather than a reproduction of the canonical TPSR lesson format. It does not prescribe fixed time allocations; rather, it provides a repeatable lesson logic. Teachers first establish psychological safety and identify support needs, then clarify the social objective of the lesson, provide appropriately challenging technical practice, apply skills through cooperation or competition, and conclude with brief reflection. A stable cycle allows social learning to occur continuously without requiring a separate activity detached from technical instruction.

Table 3. Five-Phase Lesson Structure

Phase	Purpose	Examples of teacher behavior	Examples of student behavior
1. Relational opening	Create psychological safety and prepare for learning.	Greet students; invite students to communicate accessibility and support needs; preview role arrangements; use a brief inclusive warm-up.	Identify readiness, communicate support needs, and connect with the group.
2. Responsibility awareness	Make one social/inclusion objective explicit.	Explain the day's value-based goal and behavioral standard and connect it with the technical task.	Explain in their own words what the value looks like in practice and select a personal goal.
3. Differentiated skill practice	Develop technique through appropriate challenge.	Offer multiple task levels and equipment/rule options; provide circulating feedback; avoid fixed ability labels.	Select or negotiate a task level; practice; record progress; request adaptations when needed.
4. Cooperative application	Apply skills while sharing responsibility.	Use rally goals, peer instruction, doubles, officiating, or group challenges; monitor whether roles are equitable.	Support partners, communicate, officiate fairly, solve tactical problems, and rotate roles.
5. Reflection and transfer	Consolidate learning and connect it beyond the class.	Ask 2–3 focused questions; invite student voice; identify one transfer example.	Self-assess technical and social goals; acknowledge peer contributions; identify one transfer action.

At the curriculum level, teaching can progress from respect and safe participation toward self-direction, leadership, and transfer. Table 4 provides an illustrative eight-unit progression; actual courses may expand or compress this sequence according to semester length, students' skill levels, and support needs.

Table 4. Illustrative Eight-Unit Progression

Unit	Technical focus	Primary responsibility/inclusion focus	Illustrative task
1	Racket control and basic rallying	Respect and safe participation	Partners negotiate an appropriate rally tempo so that both have repeated opportunities to contact the ball successfully.
2	Forehand drive	Cooperation	Pairs score points for controllable rally sequences and the quality of feedback rather than for winning rallies.

Unit	Technical focus	Primary responsibility/inclusion focus	Illustrative task
3	Backhand drive/push	Responsibility and self-direction	Students select one of three task levels and record progress toward an individualized performance criterion.
4	Serve and return	Fair play and rules literacy	Students rotate as server, receiver, and umpire and discuss contested decisions.
5	Placement and movement	Inclusive adaptation	Students adjust distance, target zones, speed, bounce rules, or equipment while working toward a shared placement-control goal.
6	Doubles	Communication and belonging	Groups establish communication signals and rotate leadership roles; success criteria include indicators of partner support.
7	Tactical application	Leadership and peer instruction	Students design a short practice challenge for another group and provide task versions for different skill levels.
8	Festival/competition and reflection	Transfer and advocacy	Students organize an inclusive competition format and identify how fairness and accessibility apply beyond PE.

3.3 Assessment Principles

Assessment should distinguish technical learning, framework implementation, meaningful participation, relational experience, and transfer rather than collapse them into a single global score. Technical learning should remain a primary outcome alongside social and inclusion-related outcomes and should be assessed using transparent table-tennis performance criteria. Framework implementation should be examined separately to determine whether the proposed pedagogical principles were actually enacted. Observation of responsibility-based teaching and student behavior may be informed by the Tool for Assessing Responsibility-Based Education (TARE) (Escartí et al., 2015; Wright & Craig, 2011), supplemented by records of task adaptations, role allocation, peer interaction, and teacher implementation logs.

Meaningful inclusion cannot be inferred from teacher observation or physical attendance alone. Actual practice time, access to meaningful roles,

task accessibility, and opportunities for reciprocal peer interaction can provide process evidence, whereas agency, perceived inclusion, belonging, and valued contribution require student-reported or qualitative evidence. Formal evaluation should therefore combine appropriate validated measures, where available, with student voice through interviews, open-ended responses, or other experience-based methods.

Transfer should be evaluated beyond the immediate lesson because responsible or inclusive behavior observed during class does not by itself demonstrate application in other settings. Table 5 summarizes candidate evidence for future empirical evaluation across five complementary assessment domains. These domains are intentionally separated so that successful implementation, positive student experience, and technical improvement are not treated as interchangeable indicators of framework effectiveness.

Table 5. Candidate Evidence for Future Empirical Evaluation of the Framework

Assessment domain	What should be examined	Candidate empirical evidence
Technical learning	Whether students demonstrate progress in table-tennis knowledge, technical skill, and tactical application.	Sport-specific skill assessments; performance rubrics; rally, serve/return, or placement tasks; tactical or match-performance indicators where appropriate.
Framework implementation	Whether the intended responsibility-based and disability-	TARE-informed observation where appropriate; teacher logs; records of task adaptations, role allocation, student

Assessment domain	What should be examined	Candidate empirical evidence
Meaningful participation and agency	inclusive pedagogical practices are actually enacted. Whether students have genuine access to practice, meaningful roles, appropriate challenge, and opportunities to influence their participation.	choice, and accessibility arrangements; implementation-fidelity checklists. Actual practice time; records of participation roles; accessibility observations; records of negotiated adaptations; student-reported participation, choice, agency, or perceived inclusion.
Relational experience and belonging	Whether students experience respect, reciprocal peer relationships, recognition, and valued membership in the learning community.	Student reports of respectful treatment and fairness; peer-interaction observation; reciprocal-support coding; validated belonging measures appropriate to the population; interviews or open-ended student-experience data.
Transfer beyond PE	Whether responsibility and inclusion principles are applied outside the immediate table-tennis setting.	Post-course surveys or interviews; qualitative examples of transfer to study, work, residence life, clubs, or community settings; longitudinal follow-up where feasible.

4. Discussion

4.1 Theoretical Contribution and Framework Positioning

The main contribution of the framework is to transform TPSR-informed responsibility education and disability-inclusive PE from parallel ideas into an operational sport-specific design logic. First, inclusion is conceptualized as meaningful participation, valued contribution, agency, and belonging rather than physical co-location. Second, respect, responsibility, and cooperation are embedded within technical tasks, peer relationships, roles, and assessment rather than treated as character education detached from sport learning. Third, responsibility is extended from self-control to the shared creation of accessible learning environments, including attention to unequal opportunity, excessive helping, and the conversion of ability differences into status hierarchies. This orientation is consistent with socially just approaches to TPSR (Baker et al., 2023; Scanlon et al., 2024), but the present framework should be interpreted as TPSR-informed rather than as a validated implementation of TPSR.

The framework should therefore be understood not as a fixed lesson script but as a set of testable design principles. Its central theoretical proposition is that technical learning can be organized alongside reciprocal relationships, adaptable participation pathways, student voice,

and valued contribution so that inclusion can be examined as “learning together” rather than simply “being in the same class.” Whether these design features actually improve participation, belonging, responsibility, or technical learning remains an empirical question; the present paper does not make effectiveness or causal claims.

4.2 Table Tennis as a Bounded Practice Context

Table tennis was selected not because it is inherently more inclusive than other sports, but because it makes inclusion challenges both visible and adjustable. Practice distance, ball speed, equipment, target placement, and scoring can be modified rapidly; many beginner and intermediate tasks depend on whether a partner can provide a return that allows practice to continue; and errors, rallies, and scores quickly amplify ability differences. This makes it possible for teachers to observe, within the same technical goal, whether support is reciprocal, whether adaptations preserve shared participation, and whether competition creates unnecessary status differences (Teraoka & Yotsumoto, 2024). However, the evidence base assembled for this paper contains limited direct research on disability-inclusive university table tennis or disability-specific table-tennis pedagogy. The sport-specific adaptations proposed here are therefore theoretically derived teaching propositions rather than empirically validated

prescriptions. If subsequent research supports the framework, its transferability to other racket or net/wall sports can then be examined.

4.3 Implementation Implications: Universal Design, Individualized Support, and Competition Management

Implementation should avoid two extremes: equating identical tasks with fairness, and assuming that students who need adaptations should be separated. UDL and differentiated instruction can proactively offer multiple participation pathways, but universal options cannot replace individualized reasonable accommodations (Haegele et al., 2024; Lourenço et al., 2025). Teachers should negotiate distance, speed, equipment, rules, posture, or information presentation with students around a shared learning goal, and collaborate with disability support personnel when necessary. Specific support should be based on individual experience rather than prescribed solely on the basis of a diagnostic label.

Implementation quality also depends on teacher preparation and the organization of competition. Existing studies consistently identify insufficient training, resources, and confidence as barriers to inclusive PE, while TPSR likewise depends on sustained professional learning (Pocock & Miyahara, 2018; Rekaa et al., 2019; Tant & Watelain, 2016; Dunn & Doolittle, 2020). Before class, teachers can jointly review technical progression, participation barriers, and role allocation; after class, they can record successful inclusive practices and areas requiring adjustment. This is consistent with models-based practice, which emphasizes alignment among pedagogical goals, teacher behavior, and student experience (Casey & Kirk, 2021). Competition should generally follow the sequence “mastery before comparison”: cooperative practice, personal progress, and tactical problem-solving should precede structured competition, with fair officiating, communication, progress, and supportive behavior incorporated into assessment. Handicapping or tiered competition may be used, but it should be negotiated transparently and implemented without

stigmatization (Gerdin et al., 2021; Philpot et al., 2021).

4.4 Implications for University Physical Education

University PE classes commonly bring together students with markedly different sport experiences, physical abilities, and support needs, and students may not have established relationships with one another. Embedding reciprocal roles, differentiated practice, and brief reflection within sport-specific lessons can turn otherwise implicit social objectives into teachable and observable learning content. Research on TPSR with university students suggests potential value for social-emotional competence and self-efficacy (Li et al., 2025), while university students with disabilities continue to report participation and accessibility barriers (Úbeda-Colomer et al., 2019; Yermakova & Jagiello, 2026). The university context therefore provides a direct and important setting in which to test the framework.

Nevertheless, class size, facilities, institutional policies, assessment rules, cultural context, and teacher expertise will all influence implementation. Contextual adaptation may change specific tasks and classroom routines, but five core commitments should be retained: student voice, meaningful roles, reciprocal responsibility, flexible participation pathways, and belonging.

4.5 Limitations and Future Validation

This paper has four main limitations. First, it uses purposeful conceptual synthesis rather than a systematic review, so the literature base should not be regarded as exhaustive and the framework dimensions are not statistically derived factors. Second, the framework is researcher-generated and has not yet undergone expert content validation, stakeholder co-design, or classroom-based empirical testing; its feasibility, acceptability, causal effects, and transfer effects therefore remain unknown. This is especially important because students with disabilities have not yet participated as co-designers of the present version. Third, a substantial proportion of the evidence on TPSR and inclusive PE comes from

school settings, and the core assumptions proposed for university table tennis require direct examination. Fourth, direct empirical evidence on disability-inclusive university table tennis and disability-specific table-tennis pedagogy is limited within the assembled literature, so the sport-specific adaptations and examples should be treated as hypotheses for testing rather than established best practices.

Future research should therefore not move immediately to effectiveness comparisons. Content validation, stakeholder co-design—explicitly including students with disabilities—and feasibility testing should precede controlled evaluation and transfer follow-up. The stages in Table 6 are illustrative rather than prescriptive: sample sizes, pilot duration, and analytic choices should be justified for the local context and study purpose rather than treated as fixed requirements.

Table 6. Proposed Validation Pathway

Stage	Participants/data	Primary purpose	Illustrative outputs
1. Expert content review	A multidisciplinary panel with expertise in university PE, table tennis, adapted/inclusive PE, disability, and TPSR	Establish relevance, clarity, feasibility, and conceptual coverage of the framework.	Item- and scale-level content validity indices; qualitative revision comments.
2. Stakeholder co-design	University table tennis teachers and students, explicitly including students with disabilities and students who use participation supports	Identify inaccessible or potentially stigmatizing designs, missing adaptations, and culturally relevant practices.	Thematic analysis; revised framework and classroom examples.
3. Feasibility pilot	One or more new university table tennis classes in a short-term pilot (e.g., several weeks)	Evaluate acceptability, implementation fidelity, workload, participation, and unintended exclusion.	Fidelity observations; attendance/actual activity time; brief student experience questionnaire; teacher logs; interviews.
4. Controlled evaluation	Multiple classes with a comparison condition where feasible and ethically appropriate	Examine effects on responsibility, respect, belonging, participation, and technical learning.	Pre-post outcomes, effect sizes and confidence intervals, implementation data, and subgroup/interaction analyses where justified.
5. Transfer follow-up	Students after course completion	Examine whether responsibility and inclusion values are applied beyond PE.	Follow-up survey/interview evidence; examples of transferring responsibility and inclusion values to study, work, clubs, or community life.

Validation studies should report both implementation fidelity and educational outcomes. Mixed methods are particularly suitable for this framework: quantitative data can estimate changes in technical learning and dimension-aligned outcomes, whereas observations, interviews, open-ended responses, and teacher logs can explain how students experience task adaptations, peer roles, competition, agency, and belonging. Students with disabilities should participate as co-designers in framework refinement rather than only as research participants. Formal studies should

report effect sizes, confidence intervals, implementation data, and unintended effects and, where theoretically justified and sufficiently powered, examine differences associated with initial skill level, disability-related support needs, gender, prior sport experience, or competitive orientation. Transfer requires longitudinal follow-up beyond the end of the course and should not be inferred solely from responsible behavior observed during lessons (Goodwin & Watkinson, 2000; Gordon & Doyle, 2015; Rekaa et al., 2019).

5. Conclusion

University table tennis can extend beyond technical drills and performance testing by treating responsibility, respect, participation, and belonging as explicit curriculum concerns. Drawing on TPSR-informed responsibility education, disability-inclusive pedagogy, differentiated task design, student voice, and negotiated adaptation, this researcher-generated provisional framework connects technical learning with meaningful participation by students with and without disabilities. Six dimensions—respect, responsibility, cooperation, inclusive participation, belonging,

and transfer—are translated into observable table tennis teaching practices and embedded within a cyclical five-phase lesson structure. The core proposition is that equity involves enabling students to enter learning meaningfully, contribute, retain agency, and make progress rather than treating everyone in exactly the same way. The framework has not yet been co-designed or empirically validated; its value lies in providing an explicit, practical, and testable structure for future research on whether university table tennis can support technical competence alongside responsible, respectful, and inclusive participation.

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