A pilot mixed-methods study on the impact of Aronson puzzle and body expression on motivation and classroom social climate in primary education

Un estudio piloto de métodos mixtos sobre el impacto del rompecabezas de Aronson y la expresión corporal en la motivación y el clima social del aula en educación primaria

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Abstract

Introduction and Objective. This pilot study analyzes the effects of a cooperative learning intervention, based on the Aronson Puzzle technique and Body Expression (BE), on intrinsic motivation and social climate in Primary Education. The objective was to explore how these methodologies can improve student motivation and the classroom environment in the context of Physical Education (PE).
Methodology. The intervention, composed of eight structured sessions with BE activities, was designed to foster collaboration and active engagement. A mixed-method approach was used with 26 fourth-grade students (9-10 years old), integrating quantitative and qualitative data to capture the multidimensional impact of the proposal.
Results. Quantitative data were analyzed using the Wilcoxon test, calculating effect sizes (e.g., r = 0.45 for intrinsic motivation). The results showed statistically significant increases ($p < .05$, r = 0.45) in intrinsic motivation and notable improvements in the classroom social climate (interest, satisfaction, communication). The qualitative component was developed through semi-structured interviews, analyzed with conventional content analysis, along with observations and a field diary for triangulation. The data showed an increase in enjoyment, engagement, and positive peer interactions.
Conclusions. The findings demonstrate that these cooperative methodologies not only enhance academic motivation but also positive social dynamics. It is recommended that the study be expanded with larger samples and control groups to confirm its long-term impact. This work contributes to the literature on holistic development in education through cooperative strategies.

Keywords

Child development; collaboration; cooperative learning; Physical Education; student engagement.

Resumen

Introducción y Objetivo. Este estudio piloto analiza los efectos de una intervención de aprendizaje cooperativo, basada en la técnica del Puzzle de Aronson y la Expresión Corporal (EC), sobre la motivación intrínseca y el clima social en Educación Primaria. El objetivo fue explorar cómo estas metodologías pueden mejorar la motivación del alumnado y el ambiente del aula en el contexto de la Educación Física (EF).
Metodología. La intervención, compuesta por ocho sesiones estructuradas con actividades de EC, se diseñó para fomentar la colaboración y la implicación activa. Se empleó un enfoque mixto con 26 estudiantes de cuarto curso (9-10 años), integrando datos cuantitativos y cualitativos para captar el impacto multidimensional de la propuesta.
Resultados. Los datos cuantitativos se analizaron con la prueba de Wilcoxon, calculando tamaños del efecto (por ejemplo, r = 0,45 para motivación intrínseca). Los resultados mostraron incrementos estadísticamente significativos ($p < .05$, r = 0,45) en motivación intrínseca y mejoras destacables en el clima social del aula (interés, satisfacción, comunicación). La parte cualitativa se desarrolló mediante entrevistas semiestructuradas, analizadas con análisis de contenido convencional, junto a observaciones y un diario de campo para la triangulación. Los datos mostraron un aumento en el disfrute, la implicación y las interacciones positivas entre iguales.
Conclusiones. Los hallazgos evidencian que estas metodologías cooperativas no solo potencian la motivación académica, sino también las dinámicas sociales positivas. Se recomienda ampliar el estudio con muestras mayores y grupos de control para confirmar su impacto a largo plazo. Este trabajo contribuye a la literatura sobre desarrollo integral en educación mediante estrategias cooperativas.

Palabras clave

Desarrollo infantil; colaboración; aprendizaje cooperativo; Educación Física; aprendizaje activo.

Introduction

In the current educational landscape, the teaching of Physical Education (hereafter PE) at the Primary Education level (hereafter PE) is undergoing significant transformation, driven by the need to adapt to the evolving demands of society and emerging pedagogical challenges (Leao & Lorente-Catalán, 2024). To address these challenges, a focus on innovative and evidence-based methodologies has become essential. One of the key shifts observed in recent years, as part of this adaptation to "new education," is the growing adoption of active methodologies that promote greater student participation and autonomy during the learning process, particularly in PE (Sánchez-Alcaraz et al., 2020). Among these active methodologies, cooperative learning (hereafter CL) stands out as one of the most widely implemented (Fernández-Río y Méndez-Giménez, 2016). Johnson et al. (1999) describe CL as a process grounded in social interaction among students, fostering communication, shared leadership, and mutual responsibility. They outline five essential elements that constitute its conceptual framework: positive interdependence, individual accountability, promotive interaction, social integration, and group evaluation. In CL, the coordinated effort and interaction among students are crucial for achieving the intended outcomes, which always include individual learning for every group member (Velázquez, 2013).

Numerous studies have demonstrated the cognitive, physical, affective, and social benefits of CL when implemented in PE. For instance, Casey & Goodyear's (2015) review of CL in PE highlights improvements across these four domains in Primary Education, particularly in terms of academic and social performance. Similarly, Lafont (2012) showed that as students advanced in their communicative abilities (social learning), their understanding of motor skills (academic learning) also improved. Dyson (2001), following two CL programs in PE, reported enhancements in students' social skills, while motor skill performance was comparable to that achieved in previous years using direct command methodologies. In the affective domain, Fernández-Río (2003) found improvements in self-esteem, self-concept, honesty, and responsibility, as well as increased motivation, enjoyment of physical activity, and peer interaction, following an annual CL-based program in PE for secondary students. These findings collectively suggest that CL holds potential not only for cognitive and physical development but also for affective and social improvements in PE settings, highlighting its adaptability across different educational contexts and objectives.

One commonly used technique within CL is Aronson's Jigsaw method, which involves organizing students into expert groups, each specializing in a portion of the content, before sharing their learning with their base group (Aronson, 1978). In this approach, students act as both tutors and tutees, with the success of the activity reliant on mutual cooperation, leading to comprehensive benefits (García et al., 2001). The Jigsaw technique has shown benefits in Primary Education, including improved social relationships among students working in groups (Simoni et al., 2013), enhanced academic performance (Traver &García, 2004), and increased student autonomy (Velázquez, 2023). However, despite promising results in the literature, there remains a lack of significant research on the potential of this technique to impact students' affective dimensions, particularly motivation. Similarly, studies examining the effects of the Jigsaw technique on overall classroom social climate are scarce. Although Simoni et al. (2013) reported improvements in social relationships among group members, it is unclear whether Aronson's Jigsaw technique can affect the general social climate in PE classes. This gap underscores the importance of further research focused on the socio-affective outcomes of CL, particularly in innovative content areas such as Body Expression (BE).

Student motivation in PE is a crucial factor in improving learning outcomes. Moreover, it is the responsibility of PE teachers to adapt techniques, content, and resources to meet students' interests and needs, fostering motivation and engagement (Flores et al., 2019). The Self-Determination Theory (SDT) developed by Deci &Ryan (2013) posits that the satisfaction of three basic psychological needs—autonomy, competence, and relatedness—significantly influences motivation. SDT has been widely applied to measure motivation in PE (Moreno et al., 2006). It differentiates levels of self-determined behaviour, with intrinsic motivation being the highest level, where students participate for enjoyment, interest, and without external rewards. Conversely, if these basic psychological needs are thwarted, students are more likely to be extrinsically motivated, meaning their actions are driven by external factors rather than internal satisfaction. This can be further categorized into external regulation (acting for rewards),

introjected regulation (acting to avoid guilt), and identified regulation (acting for the benefits of the activity). Finally, amotivation occurs when individuals lack interest or do not understand the reasons for participating. The relevance of SDT to educational settings underscores the need for instructional strategies that support intrinsic motivation and foster the satisfaction of students' psychological needs.

Motivation in the classroom is one of the best indicators of educational success. Therefore, identifying how teaching approaches influence motivation should be a central focus of educational research (García &Baena, 2017). A key factor that also influences motivation and serves as a strong indicator of educational success is the classroom social climate, defined as the relational structure created by the socio-affective interactions between the teacher and students, as well as among students themselves, during classroom processes (Cid, 2001). Improving the classroom social climate is one of the main challenges faced by the current educational system, as a positive social environment enhances various aspects of schooling, benefiting both teachers and students. Conversely, a negative social climate can undermine academic performance, hinder students' social development, and demotivate teachers in their instructional efforts, ultimately impacting the achievement of educational objectives (Macías et al., 2016).

One content area that may enhance both the classroom social climate and student motivation is BE. Learreta et al. (2005) explain how BE contributes to children's holistic development, strengthening their communication, expression, and creativity skills while promoting social interaction with peers. Nonetheless, studies examining the impact of Aronson's Jigsaw technique in BE learning situations at the Primary Education level are practically non-existent. Furthermore, research on the influence of this technique on key educational variables such as motivation and classroom social climate remains limited. Given the potential of BE to foster a positive social climate and intrinsic motivation, further investigation into its integration with CL strategies is warranted, particularly in the context of PE. Given the limited empirical research integrating Aronson Puzzle and Body Expression strategies in young learners' PE, pilot studies in authentic school settings are necessary to explore feasibility and inform future large-scale designs. This highlights the value of conducting exploratory studies in real school contexts to examine feasibility and identify promising directions for future large-scale interventions.

Therefore, this pilot study seeks to address these gaps by analyzing the effects of integrating Aronson's Jigsaw technique and BE on motivation and classroom social climate among Primary Education students. Specifically, the study aims to (1) examine whether the intervention improves intrinsic motivation and socio-affective classroom dynamics; and (2) explore students' perceptions and experiences regarding the implementation of these cooperative learning strategies in PE.

Method

Participants

This pilot study was conducted in a public educational centre located in Benidorm, Alicante. The sample consisted of 26 fourth-grade students, The selection was based on accessibility and feasibility criteria suitable for a pilot study. (17 girls, 65%, and 9 boys, 35%), aged between nine and ten years old (M = 9.42, SD = 0.49). The entire class was selected as the research group, and no control group was available. The sample was selected through a non-probabilistic convenience sampling. All the participants belonged to the same centre where the study was carried out. Prior to the intervention, the school administration, participants, and their families were informed about the study's characteristics, the voluntary nature of participation, and the anonymity and confidentiality of the data. All parents provided informed consent for their children's participation. While the participants had previously experienced content related to body expression (BE), they had not been exposed to Aronson's Jigsaw technique in this context. The intervention was designed and conducted by the lead researcher of this study, a teacher with 18 years of experience in Physical Education and extensive expertise in the implementation of cooperative learning methodology.

Procedure

An eight-session (45 minutes each) learning situation focused on BE was designed and implemented over a period of three weeks, using Aronson's Jigsaw technique as the guiding methodology. No control group was included due to ethical and organizational reasons within the school, as all students were to

benefit equally from the educational intervention. Therefore, a one-group pre-post design was selected as appropriate for a preliminary exploratory study. The structure of the intervention followed a four-phase framework, adapted from Aronson's original concept (1978), as suggested by Velázquez (2013), to better fit the specific educational context. The phases were: 1) Introduction, 2) Specialization, 3) Collaborative work in heterogeneous groups, and 4) Final product presentation.

In the first two sessions (Phase 1), the working methodology was explained, and different BE components were explored and practiced in a group setting. For example, students practiced fundamental rhythmic steps, such as grapevine steps and chasse, and were introduced to basic elements of group synchronization. Additionally, students were taught the first part of a simple choreography based on a modern dance routine, which included a sequence of four-count movements combining arm and leg coordination. At the end of session 2, five expert groups were formed, each tasked with specializing in a particular section of the choreography, which they worked on during session 3 (Phase 2).

In session 4, the expert groups were dissolved, and new heterogeneous groups were formed, comprising one expert from each section of the choreography. These heterogeneous groups worked collaboratively in sessions 4 through 7, with each student assuming the dual role of "teacher" for their specialized part and "learner" for the remaining parts of the choreography. For example, one group focused on incorporating a turn transition, while another refined the timing of a series of claps and jumps to ensure proper synchronization. By the end of session 7, the complete choreography, combining all sections, had been assembled.

In the final session (Phase 4), each group presented their final product to the entire class, showcasing the full choreography with the transitions and rhythm patterns developed during the sessions (table 1).

Table 1. Timeline of the Learning Situation

Phase	Sessions	Main Activities
Phase 1. Introduction	Sessions 1 and 2	Explanation of the work mechanics. Introduction to Body Expression (BE) and de-inhibition activities. Formation of specialist groups.
Phase 2. Specialization	Session 3	Each specialist group works on the assigned part of the choreography.
Phase 3. Collaborative work in heterogeneous groups	Sessions 4-7	Breaking up specialist groups and forming new groups, each composed of one specialist from each part of the choreography. Collaborative work to prepare the choreography, with each student taking on the role of both teacher and learner.
Phase 4. Final Product	Session 8	Presentation of the final product created by each group.

Instrument

Both instruments used in this study were previously validated in Spanish contexts and have demonstrated good psychometric properties in Primary Education populations. Their content, format, and language were deemed appropriate for the developmental stage of the participants. Perceived Locus of Causality Scale in Physical Education (PLOC; Moreno et al., 200). This scale, adapted to the Spanish context from Goudas et al.'s (1994) scale on motivation towards PE classes, consists of 20 items introduced by the statement "I participate in PE class because...". The items are distributed across five subscales: intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation. Responses are rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). This instrument was used to assess the reasons behind student participation in PE classes. In the present sample, the internal consistency was acceptable, with Cronbach's alpha = 0.81.

Classroom Social Climate Scale (Pérez et al., 2009): This scale focuses on the dimensions of interest, satisfaction, relationships, and communication, particularly measuring teacher-student and student-student relationships and the class's organizational structure. It consists of 12 items with four response options (never/strongly disagree, sometimes/disagree, often/agree, and always/strongly agree), grouped into the aforementioned four dimensions. Cronbach's alpha for this instrument in the current sample was 0.78, indicating acceptable reliability.

Data analysis

Quantitative Analysis

All statistical analyses were conducted using SPSS 28.0. To evaluate the normality of the data, the Shapiro-Wilk test was applied, as it is particularly suitable for small sample sizes. Results indicated non-normal distributions for key variables (e.g., intrinsic motivation: W = .91, p = .04), justifying the use of non-parametric procedures. Based on these results, the non-parametric Wilcoxon signed-rank test was chosen for analyzing pre- and post-intervention differences. This test is well-suited for paired samples where the assumption of normality is not met, allowing us to assess changes in variables before and after the intervention with robustness. In addition to Wilcoxon signed-rank tests, effect sizes (r) were calculated to assess the magnitude of observed differences and are reported alongside each test result. For instance, the effect size for the increase in intrinsic motivation was r = 0.45, indicating a moderate effect (Cohen, 1988).

Qualitative Analysis

Following the intervention, 26 semi-structured interviews were conducted with each student individually, comprising nine questions. The purpose of the qualitative analysis was to complement the quantitative data by offering deeper insights into the effects of the intervention. A conventional content analysis was conducted following the guidelines of Hsieh &Shannon (2005). The interviews began the day after the intervention ended and were completed over two days.

The semi-structured interview script (table 2) was developed by the entire research team, supervised by the research leader, with wide experience in qualitative research. It was based on the study's objectives and theoretical frameworks, including Deci & Ryan's Self-Determination Theory (2013) and the principles of cooperative learning outlined by Johnson et al. (1999). The script consisted of nine questions, grouped into thematic blocks: expectations and initial attitudes, emotional responses during the intervention, perceptions of the classroom social climate, and self-reflection. To ensure its suitability for the target age group (9–10 years old), the questions were adapted to use simple language, and a pilot interview was conducted with two children of similar age to verify comprehension. Adjustments were made based on feedback from the pilot.

Although the questions were designed to elicit specific information, they were open-ended to allow students to contribute additional insights beyond the initial question. Interviews were recorded with prior authorization from both the participants and their families, using an audio device.

To ensure trustworthiness, several procedures were followed. First, interviews were transcribed and analyzed by two independent researchers. Inter-coder reliability was calculated using Cohen's Kappa ($\kappa = 0.82$), indicating substantial agreement. Second, member checking was conducted by summarizing key interview content and sharing it with six randomly selected participants, who confirmed the accuracy of the interpretations. Third, the lead researcher maintained a daily field diary documenting classroom observations, which was systematically integrated during the triangulation process with interview data.

After completing the interviews, the information was transcribed, and the data were carefully reviewed to identify the most relevant results. Each segment of the text representing a key idea or concept was assigned a label (coding). The data were then organized and categorized inductively, resulting in three main categories and corresponding subcategories: 1) Attitude Towards BE: Defined as students' perceptions and evolving attitudes toward body expression, with subcategories of initial reluctance, openness to new experiences, and eventual enjoyment; 2) Motivation: Encompassing students' enthusiasm and engagement with the activities, with subcategories including enjoyment, sense of autonomy, and the role of music in enhancing participation; 3) Novelty Factor: Highlighting how the introduction of unfamiliar content stimulated interest and curiosity, with subcategories of excitement, increased engagement, and appreciation for exploring new forms of movement. These categories were subsequently reported in detail. Finally, theoretical saturation was considered achieved when no new categories or subcategories emerged from the final interview transcripts.

To enhance the consistency and interpretation of the results, the lead researcher observed the intervention daily, maintaining a field diary to document key observations. This allowed for the triangulation of data gathered from the interviews. Additionally, at the conclusion of the intervention, the lead researcher shared the findings with the rest of the research team to ensure consistency in the interpretation of results.

Results

Quantitative Analysis

Table 3 displays the results of the Wilcoxon test for the study variables. Significant increases were observed across all dimensions of the social climate (Interest, Satisfaction, Relationships, and Communication), with p-values ranging from 0.01 to < .001. Furthermore, intrinsic motivation increased significantly ($p < .001$), whereas external regulation and amotivation showed significant decreases ($p = .002$ and $p < .001$, respectively). These changes indicate a positive effect of the intervention on both the social and motivational dimensions.

The intervention led to statistically significant improvements in intrinsic motivation ($Z = -3.21$, $p < .01$, $r = 0.45$), indicating a medium effect size according to Cohen's (1988) criteria. In practical terms, this means that nearly half a standard deviation improvement in intrinsic motivation was observed, suggesting that the intervention had a meaningful impact on students' internal drive to participate in PE activities for their own enjoyment and interest.

Table 2. Comparative analysis using the Wilcoxon test

Variables	Pre	Post	Z	Sig.
Social Climate				
Interest	3.15 ± 0.73	3.77 ± 0.35	3.225	0.001
Satisfaction	2.99 ± 0.65	3.55 ± 0.69	2.575	0.010
Relationships	3.07 ± 0.44	3.57 ± 0.30	3.749	<.001
Communication	3.26 ± 0.53	3.72 ± 0.24	3.501	<.001
Motivational Regulation				
Intrinsic motivation	5.33 ± 1.42	6.55 ± 0.48	3.324	<.001
Identified regulation	5.26 ± 1.59	5.95 ± 0.69	1.358	0.174
Introjected regulation	4.87 ± 1.42	4.54 ± 1.49	-.672	0.501
External regulation	5.63 ± 1.44	3.62 ± 1.96	-3.172	0.002
Amotivation	3.14 ± 1.63	1.56 ± 0.83	-3.517	<.001

Qualitative Analysis

The qualitative analysis yielded results classified into five categories, as shown below:

Attitude Towards BE

During the interviews conducted after the intervention, some students expressed a preference for more traditional physical activities at the start of the learning situation:

"At first, I preferred playing a sport like raspall, I didn't feel like dancing." (Participant 1)

"I thought it was going to be boring, I didn't know what it was." (Participant 9)

This initial preference could be attributed to the fact that most students were unfamiliar with BE, although they showed great enthusiasm and curiosity:

"...I wanted to know what it was, I was eager to try something different." (Participant 3)

"I was really looking forward to it because it was something new, we were going to do in Physical Education." (Participant 6)

Ultimately, the interviews revealed a transformation in students' perception and appreciation of BE:

"In the end, I loved it, and I had a great time." (Participant 9)

"...by the end, I really enjoyed it." (Participant 1)

The analysis suggests a positive evolution in students' perceptions of BE as the learning situation progressed. This shift appeared to positively impact their motivation towards BE activities. This transformation was also noted by the lead researcher in the field diary, where early observations recorded some signs of resistance and shyness during initial sessions, which gradually gave way to enthusiasm and active participation by the final sessions.

Motivation

General Perception of Students

Qualitative responses indicated increased student engagement, interest, and satisfaction with BE activities. Many students expressed a stronger sense of autonomy and enjoyment:

"...we hadn't done so many cool games before." (Participant 12)

"...I had a lot of fun, and I laughed a lot." (Participant 10)

Confidence and Disinhibition

Students also reported personal enjoyment in exploring body movements and expressing emotions through movement, alongside increased confidence and reduced inhibition:

"At first, I was a little embarrassed, but then I wasn't." (Participant 23)

"I thought I wouldn't be good at it, but in the end, I managed." (Participant 14)

The diary entries supported these statements, noting how students who initially hesitated to perform in front of others gradually took on more expressive roles and even encouraged peers during rehearsals.

In addition to personal enjoyment, several students expressed a sense of accomplishment and satisfaction in mastering new movements or expressions:

"I didn't think I would be able to dance well, but I did better than I expected, and I had more fun than I thought." (Participant 17)

"I thought I wouldn't be good at dancing, but in the end, I was." (Participant 7)

Music as a Motivating Element

One factor that contributed to increased student motivation was the use of music as a teaching resource. Music created a more stimulating and attractive environment for the students, further enhancing their motivation for active participation:

"...with music, it was cooler, and the games were more fun." (Participant 9)

"I really liked playing while dancing to the music." (Participant 8)

According to the field diary, the presence of music appeared to elevate the overall mood of the class, with spontaneous clapping, laughter, and rhythmic movement emerging even during transitions between activities.

Novelty Factor

Along with the motivational effect of music, the novelty factor may have also played a role. For this group of students, BE content was not a regular part of their curriculum, and many expressed that doing something different kept them especially motivated:

"We did a lot of different games... that's what I liked the most." (Participant 2)

"Dancing was my favorite part... we'd never done anything related to dance." (Participant 11)

"I had a lot of fun... normally, we play sports or run... this was a big change." (Participant 12)

BE, an uncommon content for these students, seemed to stimulate their participation and motivation. Additionally, the use of a socializing methodology like Aronson's Jigsaw appeared to be one of the factors that increased the participants' interest and motivation.

Cooperative Learning Methodology

Through personal interviews, students expressed a positive appreciation for the methodology used. Many emphasized how working in groups allowed them to share ideas, solve problems together, and feel more involved in the learning process:

"I think it's better to work in a group because if we help each other, we have more ideas." (Participant 4)

"I like playing together more." (Participant 11).

Students also reported improvements in their sense of self-efficacy when participating in cooperative activities. Working in teams allowed many to feel that they contributed meaningfully to the group and that their ideas and skills were valued by their peers. This gave them a sense of competence and achievement that they didn't experience when working individually:

"Working in a group helped me a lot because there were things I didn't know how to do, and they helped me." (Participant 1)

"It was more fun doing things in groups, and that way, we could all participate." (Participant 13)

Dividing the students into expert groups and then allowing them to teach what they had learned to their base groups facilitated a meaningful exchange of knowledge, enhancing understanding, retention, motivation, and autonomy, as each student had the opportunity to teach and learn from their peers:

"I liked learning the dance this way and acting as teachers." (Participant 19)

"It was better to do it in groups because when everyone does it together, it's more confusing, and you can't learn as well." (Participant 7)

However, initial issues related to coordination, communication, and decision-making within the groups were identified:

"At first, when we started with the dance, everyone wanted to share their ideas, and we couldn't agree because they were arguing, which made it harder." (Participant 15)

"As the activity progressed and students worked together, significant improvements in collaboration and teamwork were observed." (Participant 24)

The field diary documented multiple instances of spontaneous peer support, such as students volunteering to help others remember steps or encouraging quieter classmates to participate, reinforcing the inclusive and cooperative environment perceived by the students.

Discussion

The primary aim of this pilot study was to evaluate the effects of a cooperative learning intervention, focusing on BE, on two dimensions: the affective dimension—particularly the motivational factor—and the social dimension, specifically classroom social climate, in a group of primary school students during PE classes. The findings revealed potential improvements in both intrinsic motivation and classroom social climate, supporting the exploratory hypothesis that active methodologies such as cooperative learning may be beneficial in these areas. These results align with previous research emphasizing the importance of innovative pedagogical approaches in fostering both academic and socio-emotional development. By introducing cooperative learning strategies, this study contributes to the growing body of evidence supporting their potential in promoting holistic student development. Below, the discussion is organized into three main sections: intrinsic motivation, classroom social climate, and practical implications.

Intrinsic Motivation

The intervention demonstrated a statistically significant increase in students' intrinsic motivation, as evidenced by quantitative results. This finding was further corroborated by qualitative feedback, where students expressed heightened interest and positive attitudes toward BE activities. These results highlight how innovative and engaging content can inspire curiosity and enthusiasm, key elements of intrinsic motivation. Fernández-Río (2013) emphasized the role of novelty in boosting motivation, stating that introducing unfamiliar and stimulating activities can significantly enhance student engagement. In the present study, BE transformed from an unfamiliar discipline into an enjoyable experience. Students reported feeling more enthusiastic and motivated to participate, likely due to the combination of new content and a supportive learning environment. Similarly, González-Cutre et al. (2023) found that novel content in PE contexts positively influences intrinsic motivation by breaking away from routine practices.

Importantly, while the novelty of BE content was a contributing factor, the cooperative learning methodology played a critical role in sustaining these motivational gains. Cooperative activities encouraged autonomy and peer support, both of which are central components of Self-Determination Theory (Deci & Ryan, 2013). This framework posits that intrinsic motivation is fostered when individuals feel autonomous, competent, and connected to others. The intervention addressed these needs by promoting collaborative exploration and shared responsibility, amplifying the motivational benefits of BE content.

Another key finding was the reduction in external regulation and amotivation observed in the quantitative data. This shift suggests a possible transition from extrinsically motivated behaviors to more self-determined engagement. Students in cooperative settings may have felt more empowered to take ownership of their learning. Sugano & Mamolo (2021) similarly noted that cooperative learning methodologies promote intrinsic motivation by creating environments where students feel valued and supported. Although changes in identified and introjected regulation were minimal, qualitative data revealed that some students recognized their personal strengths in BE activities. This recognition enhanced their sense of competence and connection to the tasks, consistent with findings by Sarbadi et al. (2021). Students expressed pride in teaching peers and contributing to group success, which reinforced their self-efficacy and motivation.

Classroom Social Climate

In addition to its impact on motivation, the intervention significantly improved the classroom social climate. Both quantitative and qualitative data highlighted notable progress in the dimensions of relationships and communication. Collaborative activities provided students with opportunities to engage meaningfully with peers, fostering a sense of trust, respect, and mutual understanding. The quantitative results revealed statistically significant improvements in social relationships, while qualitative feedback provided rich insights into students' experiences. Many participants reported feeling more connected to their classmates, attributing this to the cooperative nature of the activities. This aligns with Dyson & Casey's (2012) research, which demonstrated that cooperative learning enhances peer interactions º emotional well-being in PE settings. One particularly illustrative case involved a student who initially struggled with feelings of isolation. Through group participation, this student described a greater sense of belonging and improved peer relationships. While anecdotal, this example points to the potential of cooperative learning to address emotional and social challenges in school. The team-based approach seemed to strengthen classroom cohesion by encouraging mutual respect and shared responsibility. Simoni et al. (2013) found that cooperative learning fosters empathy and collaboration, essential components of a positive social climate. By working together toward common goals, students developed essential socio-emotional skills, such as effective communication, conflict resolution, and teamwork. The use of qualitative data also revealed how these changes were perceived by students. Many described the learning environment as more inclusive and supportive, with stronger bonds forming between peers. These findings highlight the importance of cooperative strategies in creating safe and collaborative spaces where students feel valued and respected.

Practical Implications

The findings of this study have significant implications for the design and delivery of PE curricula. By integrating cooperative learning methodologies with BE content, educators can create more engaging, inclusive, and meaningful learning experiences. One particularly innovative aspect of this intervention was the inclusion of music as a motivating factor. Music not only enhanced students' enjoyment and engagement but also contributed to a more positive classroom social climate. The qualitative data revealed that music fostered collaboration and shared enjoyment, making the learning experience more dynamic and appealing. Learreta et al. (2005) similarly emphasized the role of music and creative activities in promoting holistic development, particularly in PE settings. The results also underscore the importance of addressing diverse student needs through flexible and student-centered methodologies. Cooperative learning strategies provide a framework for fostering autonomy, collaboration, and mutual support, creating environments where all students can thrive. These findings are particularly relevant in contexts where socio-emotional development is a priority, demonstrating that active methodologies can address both academic and personal growth objectives.

Moreover, the potential for cooperative learning to be adapted to different educational contexts is worth exploring. The principles of collaboration and peer support could be extended beyond PE to other subjects, such as language arts or STEM, to enhance student engagement and foster a sense of community. Future research should investigate how these methodologies can be tailored to meet the needs of diverse populations and educational settings.

Limitations and Future Research Directions

Despite the promising results of this pilot study, several limitations must be acknowledged. First, the study was conducted with a small, context-specific sample, limiting the generalizability of the findings to other populations or educational settings. To address this limitation, future research should include larger and more diverse samples. Second, the short duration of the intervention may have restricted the ability to observe long-term changes. Extending the intervention and conducting follow-up assessments would help determine the sustainability of the observed effects. The absence of a control group is another important limitation. Although positive changes were observed, the lack of comparative data prevents any definitive conclusions about causality. Given these limitations, the findings should be interpreted as preliminary and hypothesis-generating. Future studies using randomized controlled designs are recommended to evaluate the effectiveness of cooperative learning with greater methodological rigor. Further research could also examine how BE and cooperative strategies impact creativity, communication skills, and emotional intelligence—beyond motivation and climate. Comparative and interdisciplinary studies may offer a more comprehensive view of their educational value.

Conclusions

This exploratory research suggests that cooperative learning combined with body expression (BE) may have a positive impact on students' self-esteem, motivation, and classroom relationships. The implementation of Aronson's Jigsaw cooperative technique allowed students to share ideas, solve problems collaboratively, and feel more engaged in the learning process—factors that appeared to support both intrinsic motivation and positive classroom dynamics.

The integration of cooperative learning in PE, particularly through BE content, shows potential for enhancing both motivational and social outcomes. These findings support the idea that active, student-centered approaches can enrich students' educational experience at multiple levels.

Importantly, the use of both quantitative and qualitative data provided a richer understanding of the effects of the intervention, reinforcing the value of mixed-methods designs in educational research. However, as a pilot study, these findings must be interpreted cautiously, and further empirical validation is necessary.

In conclusion, this research offers initial insights that may guide future studies on the use of cooperative methodologies and creative content in PE. It highlights the importance of designing learning environments that prioritize not only academic achievement but also social and emotional development.

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