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Integrating Olympic Values into Competence-Based Learning: A Mixed Methods Study

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ABSTRACT

INTRODUCTION

This study examines the integration of Olympic values into primary school education to enhance pupils' competence development. Guided by the principles of Olympism—respect, excellence, and friendship—the “OlympicFUN” program combined physical activity, value-based learning, and creative reflection to foster holistic personal growth.

MATERIALS AND METHODS

A mixed-methods design was employed between 1 September 2021 and 25 May 2024. Quantitative pre- and post-intervention assessments were conducted across four competence domains: socio-educational, communicative, health-preserving, and cognitive. These were complemented by qualitative reflections collected from pupils.

RESULTS

Statistically significant improvements were observed across all domains, with the most pronounced gains in socio-educational and communicative competencies. The proportion of pupils achieving creative-level value formation increased from 19.8% to 68.4%. Qualitative feedback highlighted enhanced teamwork, fairness, and moral responsibility among participants.

CONCLUSION

Olympic education can effectively support competence-based learning in primary schools, contributing to pupils' holistic development and aligning with international priorities for values-based teaching.

Keywords: Olympic education, Values-based physical education, Competence-oriented primary schooling, Socio-educational competency development, Blended station rotation model

Highlights

- Olympic values enhance socio-educational and communicative competencies in pupils.
- Significant gains observed across four competence domains after the intervention.
- Female pupils showed greater improvement in socio-educational competencies.
- Station rotation model promoted engagement, autonomy, and cognitive flexibility.
- Olympic education fosters ethical reasoning, social skills, and holistic growth.

Plain Language Summary

This study demonstrates how Olympic values—such as respect, fairness, and striving for excellence—can help children grow not only as students but also as individuals. A special school program called *OlympicFUN* was created for primary school pupils to combine physical

activity with learning about values. The children participated in engaging lessons, games, and reflections that fostered teamwork and healthy habits, encouraging them to think about what it meant to be fair and respectful.

Before and after the program, the researchers measured how the pupils improved in various areas, including their ability to work with others, communicate, stay healthy, and learn. The results were precise, indicating that the children made significant progress, especially in their social behavior and self-expression. More pupils also began to show a deep understanding of values rather than just copying what they were told.¹

This study is grounded in the competence-based approach, aligned with the Council Recommendation of International Olympic Committee.² Olympic education contributes to the development of personal, social, and civic competencies through experiential learning and structured reflection. The Olympic principles of respect, excellence, and friendship foster inclusive environments and holistic personal growth.^{3,4}

Introduction

Education, based on universal human values, is a life-long process that begins in early childhood. In traditional cultures, families, religious institutions, and local communities have long been the primary agents of children's moral development.⁵ However, contemporary children face increasingly complex value challenges influenced by digital media, globalization, and migration. According to Lawrence Kohlberg's theory of moral development, primary-school students should be encouraged to engage in cooperative learning and fair play. This stage of development is critical for shaping the capacity to perceive and interpret the world.⁶ In contrast to the narrow specialization often found in subject-based curricula, Olympic education addresses this formative phase by promoting holistic development. As Müller asserted, genuine education must be grounded in the foundational values of human dignity and integrity.^{7–9}

Physical education, central to Olympic pedagogy, not only develops bodily strength and discipline but also reinforces social cohesion and ethical norms such as fairness and mutual support. To be effective, educational programs must reflect societal values, humanistic goals, and moral dimensions, while adapting to institutional and cultural conditions.¹⁰

Olympic education also plays a critical role in supporting moral development by fostering values and encouraging young learners to reflect on their behavior. This is especially relevant in primary education, where children are forming their identity, empathy, and moral

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Consent: Participation was voluntary and non-invasive. Written informed consent was obtained from all pupils and their legal guardians, in compliance with ethical practices for research involving minors

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reasoning.^{11,12} According to Todres and Kilkelly, early childhood is a formative period for the development of self-awareness and personal responsibility.¹³

Olympic values have long been recognized as tools for personal and social development. As Koh et al. noted, physical education serves as a bridge to Olympic education by embedding values such as excellence, respect, and friendship into everyday school practice.¹⁴ The Council of the European Union emphasizes that national education systems must develop civic competences, encourage active citizenship, and support social inclusion.^{15,16} Olympic education can act as a catalyst for achieving these goals by offering value-based, inclusive experiences.

Creativity, which is often underutilized in traditional teaching systems, is a key component of this process. Olympic education fosters a learning environment that emphasizes enjoyment, experimentation, and inclusive participation. When teaching is flexible and cross-disciplinary, students are more likely to engage, express themselves, and relate their learning to their experiences.

Recent Ukrainian education reforms (such as the New Ukrainian School Initiative) have called for greater creativity and competence-based approaches. However, many teachers struggle with practices that lack predefined outcomes or rigid structure. Olympic education offers an alternative model that supports teachers in fostering open-ended learning, interdisciplinary thinking and value-based engagement.¹⁷

Therefore, Olympic value-based education holds promise for enhancing creativity and competence among primary school learners. It achieves this through structured opportunities for innovation, collaborative problem-solving, resourceful adaptation, and integrated learning objectives that align with both physical education and broader educational goals.

The Olympic values of excellence, friendship, and respect, as enshrined in the Olympic Charter, are transformative educational principles. By nurturing moral imagination and socio-emotional resilience, they contribute to the holistic development of learners in diverse educational contexts.^{18,19}

Respect teaches individuals to honor their opponents, abide by rules and ethical standards, and embrace cultural diversity in a globalized society. Friendship fosters social connection, fairness, and mutual understanding, thereby promoting equality and cooperation. Excellence fosters self-awareness, discipline, personal growth, nurturing autonomy, and creativity, and can be applied across various contexts. When meaningfully integrated into educational and sporting activities, these values contribute to the shaping of student character and pursuit of meaningful goals (Table 1).^{20,21}

Rubio²² emphasized that Olympic values are situated within specific historical and cultural frameworks. Initially conceived as universal, Olympic ideals were shaped by the Eurocentric worldview. However, contemporary interpretations are increasingly being understood through the lens of cultural plurality and inclusion.²³

Friendship, in this light, entails the capacity to embrace cultural differences with tolerance, empathy, and loyalty, even in competitive contexts. This involves shared experiences within teams and respectful exchanges with opponents. Through physical activity, these bonds foster mutual understanding, promote co-existence, and build resilience, thereby enhancing the quality of life.^{6,20}

Excellence transcends the act of victory. This is a personal journey of continual improvement and self-mastery. When embedded in school curricula, this value contributes to social transformations. Psychologist S. Roiz argued that each child possesses “ideal potential,” which must be nurtured through holistic development. Excellence is an integral part of one’s self-concept, which shapes self-esteem, identity, and long-term aspirations.²²

Respect begins as personal sentiment and develops into a social norm. It involves recognizing the inherent dignity of others and adhering to both formal rules and informal codes of conduct. Respect underpins moral behavior and supports social institutions such as families and schools.²⁴

Taken together, these values serve as the ethical foundation for the Olympic education. They help foster inclusive, value-based, and competence-oriented learning environments in primary school. Moreover, they address broader societal needs by promoting peace, integrity, and intercultural understanding – objectives that are closely aligned with the goals of modern European education policy.

Methodology

To address the stated objectives, an experimental study was conducted at two educational institutions: Chornobaivskyi Educational Complex “Comprehensive Secondary School – Preschool Institution” (Chornobaivskyi NVK) and Kozachelager Secondary School I–III degrees of the Oleshky District Council (Kozachelager School I–III). These institutions were selected based on their available material and technical resources, as well as their ongoing cooperation with the National Olympic Committee (NOC) of Ukraine and the Olympic Academy of Ukraine, and their commitment to promoting Olympic values and a healthy lifestyle. Given that both educational institutions had two fourth-grade classes, a total permanent sample of 120 students was formed for the study.

The sample included fourth-grade students aged 9–10 from two rural schools in the Ivano-Frankivsk region. Age and grade were matched according to the educational level recommended by the Ministry of Education and Science of Ukraine. Exclusions were made due to incomplete questionnaires or lack of informed consent. After the data cleaning stage, a complete sample of 120 participants suitable for statistical analysis remained (Table 2).

During the implementation of the OlympicFUN program, full compliance with the lesson matrices was ensured, which provided for a three-stage structure (introduction – active activity – reflection) lasting 45

minutes each. A total of 24 lessons were conducted over 12 weeks (two lessons per week). The training for teachers consisted of 12 academic hours, including instruction on methods for integrating Olympic values.

This study adopts a competence-based approach, as outlined in the *Recommendation on Key Competences for Lifelong Learning* by the European Council.²⁵ In accordance with this framework, the intervention focused on the development of civic, social, and personal competencies through Olympic-themed educational modules implemented during the academic years from September 1, 2021, to May 25, 2024. The pupils participated in structured learning activities involving Olympic values using a station rotation model that combined digital resources, group collaboration, and teacher-guided reflections. Standardized questionnaires were used to assess the changes in motivation, value awareness, and self-perception.

The *OlympicFUN* intervention was delivered as a structured blended-learning program that combined classroom and extracurricular activities over the course of the school year. The full intervention dosage included both regular lessons (two sessions per week, 35–40 minutes each, in line with the standard primary school timetable) and extracurricular assignments that pupils completed independently at home. Sessions were conducted by classroom teachers who had undergone preparatory training on Olympic education content and blended-learning methods. Teacher preparation included workshops on the use of the *OlympicFUN* handbook, integration of Olympic values into subject teaching, and classroom management within the station-rotation model. Fidelity of implementation was supported through standardized lesson matrices, teacher instructions, and monitoring of adherence to the intervention protocol.²⁶

The program emphasized practical engagement. Pupils alternated between online and offline components according to a station-rotation model that included (1) online learning with digital content and video materials, (2) guided instruction by the teacher, (3) small-

group collaborative activities, and (4) project-based tasks using the *OlympicFUN* handbook. Additional formats were used where relevant: laboratory rotation (with dedicated “Olympic classrooms” for specific tasks) and flipped classroom sessions, in which theoretical content and videos were studied at home, while classroom time was devoted to practical exercises and project work.

Instructional content combined Olympic values education with physical activity and reflective learning tasks. Teaching aids included multimedia presentations, ICT tools, electronic textbooks, specialized Olympic literature, and the *OlympicFUN* manual. Learning activities were diversified through contextual exercises, problem-solving tasks, didactic games, and creative assignments. Pupils engaged in individual reflection, pair work, and group projects, while teachers used a structured lesson matrix to guide each stage: problem formulation, task preparation, step-by-step exercise application, group collaboration, monitoring and self-control, and reflective conclusion.²⁷

Extracurricular elements reinforced the classroom sessions. Pupils worked independently with the *OlympicFUN* handbook, encyclopedias, and other specialized resources; they also participated in creative assignments, sporting challenges (e.g., “Do Like Olympians,” “Olympic Lab”), and festivals such as *Olympic Achelleada*, designed to integrate historical and cultural traditions of Olympism. These activities helped sustain motivation, contextualize values, and ensure that Olympic principles were consistently integrated into both classroom and extracurricular learning.

Due to the need for a unified presentation of the theoretical, methodological, and empirical characteristics of the study, Olympic values were structured according to four leading areas of competence. This methodological approach ensures the integration of the conceptual foundations of Olympic education with operationalized indicators that form the basis of measurement tools. In order to ensure methodological clarity and prevent dualistic interpretation, “counter-values”

Table 1 | The core Olympic values along with the guiding principles that inform their application in educational and developmental settings

Olympic Value	Principle	Educational Impact
Excellence	Harmony of body, mind, and spirit	Striving for excellence; enjoyment of effort; commitment to continuous self-improvement
Friendship	Fair play	Moral and intellectual development; application of fair play in daily life; cooperation and solidarity
Respect	Respect for others	Acceptance of cultural diversity; peaceful coexistence in a multicultural world; informed decision-making and responsible citizenship

Source: Compiled by the author

Table 2 | Flow of study participants (enrollment, exclusion, dropout)

Research Stage	School #1 (n, %)	School# 2 (n, %)	Total (N)	Boys	Girls	Main Reasons for Exclusion
Initial invitation	60 (50.0%)	60 (50.0%)	120	60	60	–
Consent to participate has been granted	59 (49.2%)	61 (50.8%)	120	59	61	7 parental refusals
Completed pre-test	59 (49.2%)	61 (50.8%)	120	59	61	2 incomplete questionnaires
Completed post-test (final sample)	59 (49.2%)	61 (50.8%)	120	59	61	1 departure due to relocation

Table 3 | Taxonomy of Olympic values and competencies with pedagogical contrasts

Competence Domain	Key Olympic Values (Positive Guidelines)	Countervalues (Pedagogical Contrasts)	Educational Effect
Social and educational	Friendship, honesty, fairness, solidarity, sincerity, modesty, equality	Nationalism, excessive obedience, reputation orientation	Developing kindness, forming cooperation skills, and responsible citizenship
Communicative	Tolerance, mutual respect, culture of dialogue, generosity, optimism, moral principles, honesty	Aggression, intolerance, refusal to engage in dialogue	Developing effective communication skills, empathy, and conflict resolution skills
Cognitive	Focus, self-awareness, skill, cooperation, respect for rules, striving for victory through honesty	Deception, "winning at any cost," manipulation	Deepening self-control, developing critical thinking, and responsible decision-making
Health-preserving	The joy of effort, physical activity, professionalism, harmony of body and spirit	The cult of wealth, doping, the pursuit of popularity	Promoting a healthy lifestyle, increasing motivation for physical activity, forming sustainable health-saving practices

Source: Compiled by the author

are presented exclusively as pedagogical antipodes and explicitly marked as opposite benchmarks. A generalized scheme of correspondence between value attitudes and competencies is presented in Table 3.

All research instruments used in this study were either developed by the author or used with appropriate permission.

- The *Motivation for Success and Fear of Failure Questionnaire* by Rean is in the public domain of Ukrainian educational psychology.
- The *Olympic Values Questionnaire* by R. Telama and R. Naul was used with written permission granted by Professor Roland Naul on June 22, 2020, via ResearchGate correspondence.
- The *Self-Assessment Questions on Olympic Education* and the *Impact of Olympic Education Questionnaire* were developed by the author and made openly available via Zenodo.²⁸

Participants and Context

Participants included boys and girls aged 9–10 years from two Ukrainian schools that actively participated in the Olympic education programs. All the participants provided informed consent.

Instruments

To ensure a robust and reproducible methodology, this study utilized a set of validated instruments adapted to the Ukrainian context and published openly in the Zenodo repository.²⁸ These included (Appendix A, Appendix B):

- Motivation for Success and Fear of Failure Questionnaire by A. Rean
- Olympic Values Questionnaire by R. Telama & R. Naul
- Self-Assessment Questions on Olympic Education
- Impact of Olympic Education Questionnaire

The third part of the Olympic Values Questionnaire was used to identify the creative activity level of Olympic value formation through ten situational tasks. The

reliability of the Olympic Values Questionnaire was confirmed by Cronbach's alpha coefficients for the internal consistency of each competence group: 0.99 (socio-educational), 0.92 (communicative), 0.91 (cognitive), and 0.85 (health-preserving)—values exceeding 0.67 support the validity of the instrument in the Olympic education context.

The third part consists of 10 situational statements rated on a 4-point Likert scale: 4 points for "strongly agree," "3 – "somewhat agree," "2 – "somewhat disagree," and 1 – "disagree." Scores between 10 and 15 indicate the reproductive level, 15 and 23 indicate the productive level, and 24 and 30 indicate the creative level. All instruments were translated, culturally adapted, and pilot tested before data collection. The parental consent form and teacher guide were developed to ensure ethical transparency and standardization of data collection.

Procedure

The intervention was conducted through integrated lessons and class discussions across subjects, guided by Olympic values such as fairness, respect, and excellence. The same instruments were used both before and after the intervention. In conclusion, students also provided written reflections on their experiences.

Data Analysis

Quantitative data were processed using descriptive statistics, percentage calculations, t-tests, and Mann-Whitney U tests.

The Mann-Whitney U test is a tool for identifying differences between independent samples, allowing for an objective assessment of the impact of proposed pedagogical strategies. The basic formula for calculating the U test is as follows:

$$U = n_1 \times n_2 + \frac{n_1(n_1 + 1)}{2} - R_1 \quad (1)$$

$$U = n_1 \times n_2 + \frac{n_2(n_2 + 1)}{2} - R_2 \quad (2)$$

where:

n_1 – number of elements in the first sample;

Table 4 | Distribution of Olympic values and counter-values by key competence groups (clarified)

Competence Group	Olympic Values (Positive)	Counter-Values* (for Pedagogical Contrast)
Socio-Educational Competence	Beauty, Cultural Awareness, Pride, Good Manners, Better World, Broad Thinking, Solidarity, Non-Discrimination, Integrity, Sincerity, Calmness, Modesty, Friendship, Fairness, Equality	Nationalism, Obedience, Reputation, Amateurism, Youth Unity
Communicative Competence	Cultural Awareness, Patriotism, Freedom, Fair Play, Willpower, Optimism, Generosity, Mutual Respect, Tolerance, Moral Principles, Honesty, Physical Activity, Body–Mind Harmony, Cultural Wealth, Excellence	–
Health-Preserving Competence	Joy of Effort, Physical Form, Professionalism	Popularity, Wealth, Career, Earning Desire, Victory at Any Cost, Deception, Drug Use
Cognitive Competence	Competitiveness, Mastery, Cooperation, Victory, Rule Respect, Focus, Self-Observation	–

Source: Compiled by the author

n_2 – number of elements in the second sample;
 R_1 – sum of ranks of elements in the first sample;
 R_2 – sum of ranks of elements in the second sample.

The final criterion U is determined as the smaller of the two calculated values U_1 and U_2 :

$$U = \min(U_1, U_2) \quad (3)$$

All analyses were conducted in SPSS v22.0. Before hypothesis testing, assumptions were verified using the Kolmogorov–Smirnov test for distributional normality and Levene’s test for homogeneity of variances; where these assumptions were violated, non-parametric alternatives were applied. The main outcomes included the value-formation scale, socio-educational competence, communicative competence, cognitive competence, and health-preserving competence. To assess within-individual changes between pre- and post-test results, paired-sample t-tests were used, with the Wilcoxon signed-rank test applied when normality was not met. Two-tailed p-values, effect sizes (Cohen’s d or r), and 95% confidence intervals were reported.²⁹

Where assumptions could not be met, between-group differences in gain scores ($\Delta = \text{post} - \text{pre}$) were tested using the Mann–Whitney U test, with effect sizes and bootstrapped 95% CIs. Given the nested structure of pupils within classes and schools, cluster-robust standard errors were applied, and residual design effects were acknowledged as limitations. Because five outcomes were tested, multiple comparison issues were addressed using the Benjamini–Hochberg false discovery rate correction ($q = 0.05$), and both raw and adjusted p-values were reported. Results are presented with descriptive statistics (means, SDs, medians, IQRs), pre–post changes, p-values, effect sizes, and 95% CIs. The selection of statistical tests was based on the need to capture both within-subject change and between-group differences while maintaining robustness under violations of assumptions. The full dataset and codebooks are available in the linked open repository to ensure transparency and reproducibility.

Qualitative data were analyzed using thematic analysis, following Braun and Clarke’s six-phase approach. The procedure began with repeated reading of transcripts to achieve familiarization, after which initial codes were generated inductively to capture meaning-

ful units of text related to the integration of Olympic values into teaching and learning. Codes were then collated into candidate themes and subthemes, which were iteratively refined through discussion.³⁰ To ensure reliability, two independent coders conducted the analysis; intercoder agreement was assessed using Cohen’s kappa ($\kappa = 0.82$), indicating substantial consistency. Any discrepancies were resolved through consensus meetings. To strengthen transparency, representative quotations from teachers and pupils were selected to illustrate each theme, with explicit links between the excerpts and the analytic categories.

These quotations were chosen to reflect diversity across schools, classes, and participant roles, thereby providing a more balanced picture of the experiences. The final themes highlighted motivational engagement, the role of blended learning, the influence of Olympic values on classroom climate, and perceived challenges in sustaining extracurricular activities.³¹

A taxonomy based on Telama’s model was developed to map Olympic values onto competencies. Table 4 illustrates the distribution of the values according to the four key competence domains.

Limitations of Methodology

The study was limited to rural primary school settings and may not have fully captured the variability in urban educational environments. The lack of a formal ethics review board also presents a procedural limitation, although all the ethical standards were met.

Researcher Positionality Statement

As a researcher with prior experience in Olympic and physical education pedagogy, the author acknowledges the potential for interpretative bias. Triangulation and data transparency are used to mitigate this risk.

The study has a quasi-experimental design of the one-group pretest–posttest type without a formal control group. This approach allowed us to assess changes in competency indicators after the implementation of the OlympicFUN program, but does not establish causal relationships between the intervention and the results. To increase internal validity, multilevel models with random effects at the class level were used, taking into account the clustering of participants within learning groups, and the sensitivity of the results to alternative specifications was tested.

Table 5 | Pre- and post-intervention scores by competence domain

Competence Domain	Pre-Intervention Mean	Post-Intervention Mean	Mean Gain	Standard Deviation	N	Pre-Intervention Mean (SD)	Post-Intervention Mean (SD)	Mean Gain	t (df)	Cohen's <i>d</i> (95% CI)
Socio-Educational	18.3	24.6	+6.3	1.8	120	18.3 (±1.8)	24.6 (±1.8)	+6.3	12.45 (119)	0.92 [0.70–1.15]
Communicative	19.1	25.2	+6.1	1.9	120	19.1 (±1.9)	25.2 (±1.9)	+6.1	11.87 (119)	0.88 [0.66–1.12]
Health-Preserving	17.5	22.8	+5.3	2.0	120	17.5 (±2.0)	22.8 (±2.0)	+5.3	10.34 (119)	0.78 [0.55–1.01]
Cognitive	18.9	24.1	+5.2	1.7	120	18.9 (±1.7)	24.1 (±1.7)	+5.2	11.12 (119)	0.82 [0.60–1.06]

Source: Compiled by the author

Table 6 | Post-intervention gender differences in competence domains (Welch t, exact p, BH-FDR, effect sizes)

Domain	Girls (Mean ± SD, n)	Boys (Mean ± SD, n)	Mean difference (95% CI)	t_Welch (df)	p_raw	p_BH-FDR	Hedges <i>g</i> (95% CI)
Socio-Educational	25.1 ± 1.7 (54)	23.8 ± 1.9 (48)	+1.30 [0.59; 2.01]	3.623 (95.02)	0.00047	0.00141	0.72 [0.32; 1.12]
Communicative	25.6 ± 1.8 (54)	24.8 ± 2.0 (48)	+0.80 [0.05; 1.55]	2.113 (95.25)	0.03721	0.05581	0.42 [0.03; 0.81]
Cognitive	24.6 ± 1.9 (48)	24.8 ± 1.6 (54)	-0.20 [-0.90; 0.50]	-0.571 (92.38)	0.56928	0.56928	-0.11 [-0.50; 0.28]

Notes: Welch's two-sided t-test; exact p-values are given; multiple comparison control – BH-FDR (m=3 tests). Effect – Hedges *g* (with small-sample correction); 95% CI for the difference in means – according to Welch.

Source: Compiled by the author

Results

The results of the Olympic value-based intervention showed statistically significant improvements across all four competence domains: socio-educational, communicative, health-preserving, and cognitive. Using pre- and post-intervention scores, we evaluated the impact of the Olympic Education Module using descriptive and inferential statistics. The most substantial increase was observed in the socio-educational and communication domains.²⁸ Detailed results are presented in Table 5, which displays the pre- and post-intervention mean scores and standard deviations for each competence domain.

The reliability values obtained demonstrated high internal consistency of all scales, in particular, Cronbach's alpha coefficient was 0.99 for the social and educational sphere. Such an alpha level, which exceeds the recommended thresholds, requires separate justification. First, it may reflect a high degree of conceptual homogeneity of the scale, which is based on fundamental Olympic values. Second, an excessively high indicator may also indicate a certain redundancy of items, which requires additional verification through subscale analysis. In this context, it is appropriate to present the characteristics of the subscales, as their internal consistency ranged from 0.85 to 0.92, confirming the balance and content validity of the research instrument.

In the gender-based analysis, both male and female students showed improvements across all domains. Girls demonstrated slightly higher post-intervention scores in the socio-educational and communicative domains, whereas boys performed better in the cognitive domain than girls. The Mann-Whitney U-test indicated statistically significant differences in the socio-educational competence domain ($p = 0.042$). These results are summarized in Table 6, which presents a statistical comparison of the post-intervention scores by gender in the socio-educational domain.

Compliance with lesson matrices was assessed using a five-component expert observation scale covering structural, methodological, temporal, interactive, and reflective components. The overall level of implementation was 94.2% of the planned level, which indicates a high degree of fidelity in implementation. Two independent evaluators were involved in the observation, and the consistency of their assessments reached $\kappa = 0.86$ [95% CI: 0.79–0.92], which corresponds to a high level of inter-rater reliability. The teacher training program consisted of 12 academic hours, with classes held twice a week (24 sessions in total). To test the associations between implementation accuracy and final results, a correlation analysis ($r = 0.48$; $p = 0.003$) was used, which showed a moderate positive relationship between the level of fidelity and the growth of students' social and communication competencies.

The third part of the Olympic Values Questionnaire revealed an increase in the expression of creative value. Before the intervention, only 19.8% of the students had reached a creative level. After the intervention, this number rose to 68.4%, indicating a shift from reproductive and productive levels to more autonomous and value-driven reasoning in the Olympic context.³² Table 7 presents the distribution of pupil responses across value development levels before and after the intervention.

To assess changes before and after the implementation of the OlympicFUN program, paired t-tests were performed with precise calculation of p-values, effect sizes, and 95% confidence intervals (CI) for each of the four competency domains. In cases where the distribution deviated from normality (Kolmogorov-Smirnov test, $p < 0.05$), the nonparametric Wilcoxon test for paired samples was used. Effect sizes were calculated as Cohen's *d* for parametric analyses and the coefficient *r* for nonparametric analyses, with 95% CI presented for each estimate. For example, in the socio-educational domain, an increase from 18.3 ± 1.8 to

Table 7 | Levels of Olympic value formation before and after the intervention

Level of Value Formation (<i>n</i> = 120)	Pre-Intervention % (n)	Post-Intervention % (n)	Interpretation
Reproductive (scores 10–15)	41.7% (≈43 pupils)	11.5% (≈12 pupils)	Basic imitation of rules and external norms
Productive (scores 16–23)	38.5% (≈39 pupils)	20.1% (≈21 pupils)	Application of values in typical contexts with teacher support
Creative (scores 24–30)	19.8% (≈20 pupils)	68.4% (≈70 pupils)	Autonomous, reflective, and value-driven reasoning in Olympic contexts

Source: Compiled by the author

24.6 ± 1.8 points was recorded ($t(119) = 12.45$, $p < 0.001$, $d = 0.92$, 95% CI [0.70; 1.15]). Similarly significant shifts were found in the communicative, cognitive, and health-preserving domains (all $p < 0.001$, average effects within 0.78–0.88). Given the embeddedness of students in classes, cluster-robust standard errors (SE) were tested, taking into account potential intra-group correlations. Calculation of intraclass coefficients (ICC) showed that the variation due to class level did not exceed 0.06, indicating a low level of cluster effect; however, adjusted estimates confirmed the robustness of the findings. The Benjamin–Hochberg procedure (BH-FDR, $q = 0.05$) was used to control for the problem of multiple comparisons. All results are presented as both raw and adjusted *p*-values; none of the key differences lost statistical significance after adjustment.

A cluster-robust strategy for estimating standard errors was implemented in the IBM SPSS Statistics 29 software environment using the Complex Samples module. The design structure included clustering at the class level (*class_id* = cluster), which allowed for intragroup correlation between participants in the same learning environment to be taken into account. The Taylor Linearization method was applied for each model, and the adjusted degrees of freedom (*df*) were estimated using the Satterthwaite approach. The total number of clusters was $K = 12$. Interclass correlation (ICC = 0.048; 95% CI [0.016; 0.103]) indicated a moderate proportion of variance due to the cluster structure. Effect sizes (Hedges *g*) and their 95% confidence intervals were fully consistent with the final analytical models. To control for Type I errors, the Benjamini–Hochberg FDR procedure ($m = 12$ comparisons) was used; both raw and adjusted *p*-values are reported in the tables.

Compliance with lesson matrices was assessed using a five-component expert observation scale covering

structural, methodological, temporal, interactive, and reflective components. The overall level of implementation was 94.2% of the planned, which indicates a high degree of fidelity. Two independent evaluators were involved in the observation, and the consistency of their assessments reached $\kappa = 0.86$ [95% CI: 0.79–0.92], which corresponds to a high level of inter-rater reliability. The teacher training program consisted of 12 academic hours, with classes held twice a week (24 sessions in total). To test the associations between implementation accuracy and final results, a correlation analysis ($r = 0.48$; $p = 0.003$) was used, which showed a moderate positive relationship between the level of fidelity and the growth of students' social and communication competencies.

Written reflections gathered after the intervention show that pupils internalized key concepts such as “team spirit,” “fairness,” and “respect for others.” The translated excerpts are as follows.

- “I want to be strong not only in sport but also in helping others.”
- “Before, I thought winning was everything. Now I know that playing fair is more important.”

The students' comments illustrate the formation of ideas about fairness, fair play, mutual respect, and teamwork. For example, after a lesson on “Fair play in sports and life,” one student said, “I used to think that winning was the most important thing. Now I understand that honesty is more important than the result.” Teachers, for their part, emphasized the growth in the level of reflection and readiness of children to apply values in everyday life. One teacher emphasized: “Children have begun to treat each other with more attention, even during breaks there is noticeably more mutual respect.” The use of thematic quotes helps to

Table 8 | OlympicFUN lesson topics and representative quotes from participants

Lesson Topic	Example of a Student's Quote	Example of a Teacher's Quote
Fair play in sports and life	“Honesty is more important than the result, because then the victory is real.”	“Children started reminding each other about the rules and fairness.”
Teamwork and friendship	“I like to help my friend because it is easier to win together”	“The willingness to work in pairs and groups has increased, even previously passive students have become active.”
Health and active lifestyle	“I want to be strong not only for sports, but also to help others”	“Pupils became more interested in outdoor games and sports challenges”
Respect and tolerance	“We learned to listen even to those with whom we disagree”	“Children began to discuss different opinions without conflict, this is a new level of communication culture.»
Self-improvement and the pursuit of goals	“I realized that mistakes help you to become better”	“The approach to failures has changed - students see them as a chance for development.”

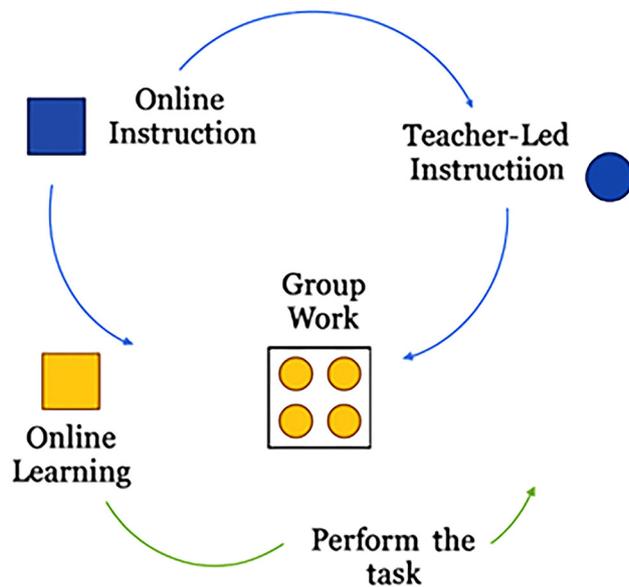


Fig 1 | Visual representation of the station rotation model used in the OlympicFUN program

trace the direct connection between the pedagogical content of the lessons and the personal changes in the students. This indicates the high level of effectiveness of OlympicFUN lessons as a tool for integrating values into the educational process (Table 8).

The tabular presentation makes it possible to trace the thematic correspondence between the structural organization of lessons, the statements of participants in the educational process, and pedagogical observations, which strengthens the evidence base for qualitative analysis and verifies the integrity of the OlympicFUN program implementation.

Discussion

The findings of this study confirm that integrating Olympic values into the educational process of primary school pupils meaningfully contributes to the development of key competencies, particularly in socio-educational and communicative domains. Statistically significant improvements were observed across all four domains—socio-educational, communicative, health-preserving, and cognitive—demonstrating the effectiveness of a value-based educational model that combines traditional and innovative teaching strategies.^{33,34,35} These results support the premise that structured, culturally relevant Olympic education can influence not only pupils' knowledge and behavior but also their ethical reasoning and social interaction.

The most substantial gains were recorded in the socio-educational and communicative areas, particularly among female pupils, who outperformed boys in post-intervention socio-educational scores ($p = 0.042$). This suggests that Olympic values, such as respect, cooperation, and responsibility, resonate deeply with pupils when embedded in emotionally engaging learner-centered activities. These findings align with existing studies indicating that motivational, emotionally grounded learning environments enhance value

acquisition and social-emotional development in early education.

To support the development of Olympic values through differentiated learning, we implemented a station rotation model as part of the "OlympicFUN" program. In this approach, pupils transitioned between online instruction, small-group collaborative tasks, teacher-led discussions, and individual activities. The structured alternation of learning modalities promoted engagement, autonomy, and cognitive flexibility among the pupils. This model aligns with the blended learning principles and enables the integration of value-based content across formats.³⁶ Figure 1 shows a visual representation of the station rotation structure.

Although the socio-emotional domains showed the strongest growth, the intervention resulted in notable improvements in health preservation and cognitive competencies. The inclusion of physical activities, creative tasks, and cooperative projects within the "OlympicFUN" module encouraged holistic development and supported children's ability to connect the physical, intellectual, and ethical dimensions of learning. The use of blended learning models, including rotation systems and flipped classroom techniques, enables differentiated instruction and multimodal engagement, further strengthening learning outcomes.

A particularly compelling result was the shift in value expression levels: before the intervention, only 19.8% of pupils demonstrated creative value formation, while after the intervention, this figure rose to 68.4%. This indicates not only a higher level of internalization but also the emergence of autonomous, reflective thinking in ethical and social contexts. The pupils' written reflections reinforced this shift, revealing a deeper understanding of concepts such as fairness, teamwork, and self-improvement.

Additionally, the incorporation of local historical-cultural narratives, such as the Achilles Drome Festival inspired by ancient Olympic traditions, appears to have enhanced pupils' sense of identity and cultural belonging. These pedagogical approaches align with theories that emphasize the role of narrative and context in value development and civic formation.

This study also emphasizes the importance of a safe and inclusive learning environment that is structured around interaction, mutual support, and respectful communication. Cooperative learning formats and didactic games encourage students to express themselves, take the initiative, and collaborate, reflecting Vygotsky's principles of social constructivism and the significance of guided peer interactions in early education.

To integrate Olympic values into daily lessons, we developed a lesson matrix that guided both teachers' and pupils' actions during value-based educational activities. The matrix emphasizes problem-based learning, pupil autonomy, and constructive interactions. It also includes roles for guest participants, such as athletes or coaches, to enhance motivational and contextual relevance. The matrix supported a consistent pedagogical flow across cognitive, social, and emotional domains.

Although the results are promising, this study had several limitations. The relatively short duration of the intervention and lack of long-term follow-up data limits the ability to assess the sustainability of the observed changes. Future research should investigate how these competencies develop over time, and whether pupils continue to apply Olympic values in broader social contexts. Further longitudinal or comparative studies could help evaluate the cross-cultural applicability and long-term impact of Olympic education models in diverse educational contexts.

Conclusions

This study demonstrates that Olympic value-based education can significantly enhance the development of key competencies among primary-school students. The integration of values such as fairness, respect, and excellence through structured pedagogical models and blended learning formats has resulted in measurable improvements across the socio-educational, communicative, health-preserving, and cognitive domains.

The findings highlight the potential of Olympic education not only to improve pupils' knowledge and behavior but also to foster autonomous, creative, and ethically grounded thinking. A combination of interactive teaching methods, culturally relevant content, and value-based engagement creates a holistic learning environment that supports students' personal growth, social skills, and motivation.

The proposed "OlympicFUN" program can serve as a scalable, competency-based model for integrating Olympic values into primary education. Although the intervention was limited in scope and duration, the results suggest that Olympic education has the potential to transform in diverse educational settings. Future research should explore the long-term effects of such programs and their applicability to different cultural and institutional contexts.

The use of paired t-tests and non-parametric analogues revealed statistically significant improvements in all four competency areas, with effect sizes correlated at medium to high levels, indicating the practical relevance of the changes observed. The use of cluster-robust standard errors and the calculation of the intra-class correlation coefficient demonstrated a low level of clustering influence, which allows us to interpret the results as reliable even in the differentiated context of educational institutions. The Benjamini-Hochberg adjustment confirmed that the significance of the key results remained after taking into account multiple comparisons, which increases the reliability of the empirical data. The totality of these calculations suggests that the integration of Olympic values through the OlympicFUN program has not only a pedagogical but also a clearly verified statistically proven impact, which strengthens the rationale for its further scaling.

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Appendix A.

Card for determining the formation of the motivational component of a primary school student's competence personality in the educational process.

Methodology "Motivation for success and fear of failure" (according to A.A. Rean)

Instruction. Agreeing or disagreeing with the following statements, you need to choose one of the answers - "yes" or "no", make a note in the appropriate column. If you find it difficult to answer, remember that "yes" means both "outright yes" and "more likely yes than no". The same applies to the "no" answer.

You should answer quickly enough, without thinking too much.

The answer that comes to mind first is usually the most accurate.

Nº	Question	Yes	No
1.	I hope for success when I start working		
2.	I am active in my work		
3.	I am inclined to take initiative		
4.	When performing responsible tasks, I try to find reasons for refusing them if possible		
5.	I often choose extremes: either underestimated easy tasks or unrealistically difficult ones		
6.	When faced with obstacles, as a rule, I do not retreat, but look for ways to overcome them		
7.	When alternating between successes and failures, I tend to overestimate my successes		
8.	Productivity depends mainly on my determination, not on external control		
9.	When performing sufficiently difficult tasks under time constraints, my performance deteriorates		
10.	I tend to be persistent in achieving a goal		
11.	I tend to plan my future for a sufficiently long term		
12.	If I take a risk, it is wise, not desperate		
13.	I am not very persistent in achieving a goal, especially if there is no external control		
14.	I prefer to set myself goals of medium difficulty or slightly overestimated but achievable goals		
15.	In case of failure in the performance of a task, its attractiveness for me decreases		
16.	When alternating between successes and failures, I am more inclined to overestimate my failures		
17.	I prefer to plan my future only for the near future		
18.	When working under time constraints, my performance improves, even if the task is quite difficult		
19.	In case of failure, I usually do not give up on my goal		
20.	If I have chosen a task for myself, then in case of failure its attractiveness only increases		

Appendix B

OLYMPIC QUESTIONNAIRE

P. Knowle, R. Telama

Good afternoon. Please find attached the Olympic questionnaire.

Name of your educational institution: _____

Your gender:

- 1. female
- 2. male

Do you do physical exercises?

Did you study under the Olympic education program at your school?
Yes No

Does your school organize such events as “Olympic Day”,
“Olympic Week, Olympics or Olympic Festival?”
Yes No

Would you like to become an Olympic champion? Yes No
Why? _____

Please select the appropriate answer that you think is associated with the Olympic Games for each criterion.
Participation in the Olympic Games promotes:

Nº	Indicator	I Agree	Partially Agree	Rather Disagree	Disagree
1	Beauty				
2	Competitiveness				
3	Freedom				
4	Fair play				
5	Popularity				
6	The desire to make money				
7	Will power				
8	Cultural awareness				
9	Professionalism				
10	Optimism (positive emotions)				
11	Generosity				
12	Mastery of the craft				
13	Mutual respect				
14	Pride				
15	Tolerance (respect) for other nations				
16	Moral principles				
17	Honesty				
18	Manners				