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MODERN THEORIES AND METHODOLOGIES FOR EARLY IDENTIFICATION OF SPORTS TALENT: PRESSING ISSUES FOR OLYMPIC AND PARALYMPIC PATHWAYS IN UZBEKISTAN

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Annotation. This article analyzes the issue of early identification of talented young athletes from the perspective of modern theories and methodologies. It examines key aspects of selecting gifted athletes to achieve high results in Olympic and Paralympic sports, with a focus on Uzbekistan's experience in this domain. In particular, using the example of young Greco-Roman wrestlers aged 12–14, the current state of the talent identification system, the effectiveness of applied methods, and pressing issues of early selection are highlighted. Based on the findings, conclusions and recommendations are provided to improve the sports talent selection system.

Keywords: sports talent; early identification; talent selection; talented athletes; youth wrestling.

Introduction

High international performance is tightly coupled to the capacity of a national system to identify talented youth early and develop them systematically over many years. Countries with mature talent identification (TID) pipelines use structured testing and longitudinal monitoring to direct children toward sports that fit their morpho-functional profiles, rather than relying on ad-hoc observation alone.

Uzbekistan is actively reforming this space. Recent state announcements and decrees have emphasized advanced sports education, digital monitoring of youth athletes' physical indicators, and pipeline alignment from schools to elite programs. A new electronic system is being introduced in general schools to assess physiological and anthropometric data and guide students toward suitable sports—a shift intended to widen reach and objectivity in early selection. The government has also highlighted talent selection and coach development for football and other sports, with dedicated schools and national-team centers to create a consistent pipeline. In parallel, the Olympic Village in Tashkent has been positioned as an integrated training-education-science hub, and from 2026 the Republican Olympic & Paralympic Center is slated to operate as a specialized school and college with state funding and access to Village facilities—material steps that enable modern TID practices at scale.

Contextually, Uzbekistan's surge in results at Paris 2024—including a top-15 Olympic medal table finish (8 gold, 2 silver, 3 bronze; rank 13) and a historically strong Paralympic campaign—underlines the timeliness of institutionalizing robust TID.

Theoretical background

2.1. What constitutes "sports talent"?

In sport science, talent is a multi-component construct: genetic endowment, body composition and structure, neuromuscular qualities (speed, strength, power), energy-system capacities, perceptual–cognitive abilities, psycho-behavioral attributes (motivation, resilience), and environmental affordances (coaching, facilities). Effective early identification therefore requires multi-domain assessment rather than any single test.

2.2. Long-Term Athlete Development (LTAD)

The LTAD 2.1 framework stresses age-appropriate, development-sensitive training, the integration of school physical education, community sport, and elite pathways,

and the need to base programming on developmental (not merely chronological) age and "sensitive periods" of trainability. It outlines seven stages from Active Start through Active for Life, with two added stages (Awareness, First Involvement) for athletes with disabilities—directly relevant to Paralympic TID.

2.3. Early specialization versus diversification

Across most sports, intensive single-sport specialization before puberty is neither necessary nor generally advantageous for long-term elite success, and it elevates risks of overuse injury and burnout. Consensus guidance favors early diversification (multi-sport participation) and later specialization during mid- to late-adolescence—while recognizing a few early-specialization sports (e.g., women's artistic gymnastics).

2.4. Relative Age Effect (RAE) and bio-banding

The RAE—systematic over-selection of athletes born early in the selection year—distorts pipelines, fuels dropout among relatively younger peers, and narrows the talent pool. Mitigations include grouping by biological maturity (bio-banding), using proxies such as % predicted adult height or peak-height-velocity timing to complement age categories.

Methods (framework and applied case)

3.1. Evidence base

We synthesized (i) international TID practice data across sports (n = 724 athletes), (ii) comparative results in 12–14-year-olds across wrestling, athletics, and non-athletes, (iii) wrestling-specific test literature (dummy-throw and Starosta-type batteries), (iv) LTAD guidance, and (v) Uzbekistan policy documents and announcements (digital TID platforms, Olympic Village/Center).

3.2. Applied case: 12–14-year-old Greco-Roman wrestlers

We outline a selection battery combining:

Anthropometry & maturity: standing/sitting height, body mass, segment lengths; maturity offset or %PAH for bio-banding.

Physical capacities: 20–30 m sprint (speed), T-test or equivalent (agility), standing and vertical jump (power), grip dynamometry and pull-ups (strength), 60–90 s repeated-effort shuttle or 1000–1500 m run (aerobic/anaerobic profile).

Sport-specific: standardized dummy-throw tests (e.g., maximum suplexes in 15 s; controlled throws in 30 s), short technical execution under fatigue, and supervised sparring indices.

Psycho-behavioral: validated scales for achievement motivation, competitive anxiety/stress coping; structured coach observation rubrics.

Medical/functional: musculoskeletal screening; injury history and red flags.

Contextual: training age, attendance, coachability, and family support.

The battery can be digitally logged for longitudinal modeling—consistent with Uzbekistan's emerging systems for school-level physiological/anthropometric assessment and federations' electronic monitoring.

Table 1.

Empirical distribution across 724 athletes (multi-sport, Turkey)

Talent selection approach	Share of athletes (%)
No formal talent test (natural selection)	70.72
At least one formal test applied	29.28
— Observed physical features	5.66
— Competition results used	8.14
— Basic motor tests (speed/strength/endurance/coordination/balance/flexibility/agility)	10.35
— Technical capacity in competition	5.11

Table 2.

Expected test tendencies in 12–14-year-olds by group Athletics vs. Greco-Roman wrestlers vs. non-athletes (comparative study)

Test (example)	Best-performing group (tendency)
30 m sprint, agility (T-test), 1000 m run/walk	Athletics group tends to outperform
Hand-grip strength, 1-min sit-ups, flexibility, balance (Flamingo)	Wrestlers tend to outperform
Most outcomes across domains	Non-athletes lowest

Results and analysis

Implication: Group-specific profiles are consistent with sport demands (wrestling → strength/balance/flexibility; athletics → speed/aerobic & agility). For Greco-Roman selection at 12–14, place greater weight on strength endurance, grip/upper-body force, trunk endurance, flexibility, and combat-specific capacity—while still tracking speed and agility.

4.1. Wrestling-specific tests and field sensitivity

Field studies validate dummy-throw tests (e.g., "max suplexes in 15 s" or "4 controlled suplexes in 30 s") as sensitive to wrestling-specific capacity and fatigue. Broader batteries inspired by Starosta's coordination suite complement general fitness with combat-relevant skills.

4.2. Managing selection biases: RAE and maturation

Given the RAE's association with dropout and narrowed pipelines, we recommend bio-banded trials (grouping by maturity) within age-group competitions. This approach reduces maturity-driven variance and is positively appraised by youth athletes and coaches.

4.3. Uzbekistan: policy alignment and pathway design

Digital school-based assessments of physiological/anthropometric indicators and routing to appropriate sports are being introduced—creating a data backbone for TID at scale.

National structures (e.g., 14 UFA football schools; national-team center; foreign expert integration) exemplify pipeline coherence.

The Olympic Village is mandated to integrate education, science, medicine, and training; from 2026 the Republican Olympic & Paralympic Center becomes a state-funded specialized school/college with access to Village facilities and student stipends—an ideal locus for multi-domain TID and longitudinal monitoring.

Public competitions such as "Olympic Peaks of New Uzbekistan / Presidential Olympics" are intended to surface talent nationally and place winners into specialized centers—useful selection funnels if coupled with standardized testing and bio-banded tiers.

4.4. Performance backdrop

Uzbekistan's rank 13 at the Paris 2024 Olympics (8–2–3) and its record Paralympic medal haul underscore the momentum and the strategic value of deepening evidence-based TID to sustain and expand success.

5. Discussion

Multifactor TID outperforms"single-metric" selection. Table 1 shows that motor test batteries are underused globally, despite their objectivity. Embedding standardized tests—plus wrestling-specific tasks—into Uzbekistan's digital school pipeline can improve fairness and signal faster growth trajectories.

Balance diversification and early technical windows. Evidence cautions against premature specialization for most sports; yet Greco-Roman demands early acquisition of movement literacy, trunk strength, and flexibility. The pragmatic compromise is broad early diversification (ages ~6–12), systematic general motor development, then increasing specialization after puberty onset, with injury-prevention guardrails. Mitigate

RAE with bio-banding and flexible selection gates. Early developers should not crowd out late-maturing talent. Bio-banded tryouts and tiered entry points (e.g., "late-developer" entry camps) keep the pool wide and reduce attrition. Paralympic inclusion from the start. LTAD for athletes with disabilities begins with Awareness and First Involvement, ensuring early, positive experiences and access to fundamentals before specialization. Embedding classification-aligned tests and medical safeguards into the same digital monitoring system is essential. Coach education matters. Prior government reviews have identified skill gaps in coaching cadres; scaling TID requires strong CPD for youth coaches in physiology, pedagogy, psychology, and data use.

6. Practical proposal: a phased TID protocol for 12–14-year-old Greco-Roman wrestlers (Uzbekistan)

School screen (all students) → height/weight, simple motor tests (20–30 m sprint, standing long jump, sit-ups, hand-grip, sit-and-reach), movement screen; basic interest survey. Data to national platform.

District camp (bio-banded groups) → add agility test, vertical jump, pull-ups, repeated-sprint or 1000 m run; psycho-behavioral screen; medical clearance.

Wrestling-specific trial → standardized dummy-throw (e.g., 15 s max, 30 s controlled), short technical series under supervision; brief sparring with rubric scoring (work-rate, control, adaptability).

Selection decision → composite "talent profile" (z-scores across domains) with coach panel + data scientist review; pathway assignment (local school program vs. specialized center).

Longitudinal tracking (quarterly) → progress flags, injury logs, school performance; bio-band re-assignment as maturity changes; communicate with parents and athletes.

Paralympic pathway → early awareness clinics, classification-aware testing, and adapted skill development through the same data infrastructure.

Conclusion

Early identification works best when multi-domain, development-aware, and system-integrated. For Uzbekistan, the convergence of (i) school-based digital assessment, (ii) national competitions as discovery funnels, (iii) an integrated Olympic Village and a specialized Center (from 2026), and (iv) coach upskilling creates the institutional backbone for world-class TID in Olympic and Paralympic sport. Pairing that infrastructure with bio-banded selection, diversified early training, and wrestling-specific batteries can maximize fairness, broaden the pipeline, and raise the ceiling for 12–14-year-old Greco-Roman prospects—while safeguarding health and long-term development.

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