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DEVELOPING STUDENTS WITH INTELLECTUAL DISABILITIES THROUGH DIDACTIC GAMES: AN EVIDENCE-INFORMED REVIEW IN THE CONTEXT OF UZBEKISTAN

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Abstract. This article examines the pedagogical potential of didactic games for developing cognitive, language, numeracy, adaptive and social skills among school-aged learners with intellectual disabilities. Using a structured narrative review and comparative document analysis, the study synthesizes international empirical literature, publications by Uzbek specialists and Uzbekistan's legal framework for inclusive education. Findings suggest that games are most educationally useful when they target a clearly defined skill, provide explicit modeling and feedback, are adapted to learners' communication and cognitive profiles, and are assessed through performance in authentic tasks. Evidence from serious-game trials is encouraging but heterogeneous and cannot be generalized to every type of game or learner. The article offers a practical implementation and monitoring framework for special and inclusive classrooms in Uzbekistan; it does not report original experimental data.

Keywords: intellectual disability; didactic games; special education; inclusive education; cognitive development; Uzbekistan.

Annotatsiya. Ushbu maqolada aqliy zaifligi bo'lgan maktab yoshidagi o'quvchilarda kognitiv, til, hisoblash, moslashuvchan va ijtimoiy ko'nikmalarni rivojlantirish uchun didaktik o'yinlarning pedagogik salohiyati o'rganiladi. Strukturaviy rivoyat sharhi va qiyosiy hujjatlar tahlilidan foydalangan holda, tadqiqot xalqaro empirik adabiyotlarni, o'zbek mutaxassislarining nashrlarini va O'zbekistonning inklyuziv ta'lim bo'yicha huquqiy asoslarini sintez qiladi. Tadqiqot natijalari shuni ko'rsatadiki, o'yinlar aniq belgilangan ko'nikmaga qaratilgan, aniq modellashtirish va fikr-mulohazalarni taqdim etgan, o'quvchilarning muloqot va kognitiv profillariga moslashtirilgan va haqiqiy vazifalarni bajarish orqali baholanganda, ta'lim jihatidan eng foydali hisoblanadi. Jiddiy o'yin sinovlaridan olingan dalillar dalda beruvchi, ammo turlicha va har bir o'yin turi yoki o'quvchi uchun umumlashtirilishi mumkin emas. Maqolada O'zbekistondagi maxsus va inklyuziv sinflar uchun amaliy amalga oshirish va monitoring qilish tizimi taklif etiladi; u asl eksperimental ma'lumotlarni taqdim etmaydi.

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Kalit so'zlar: aqli zaiflik; didaktik o'yinlar; maxsus ta'lim; inklyuziv ta'lim; kognitiv rivojlanish; O'zbekiston.

Аннотация. В данной статье рассматривается педагогический потенциал дидактических игр для развития когнитивных, языковых, математических, адаптивных и социальных навыков у школьников с интеллектуальными нарушениями. Используя структурированный обзор литературы и сравнительный анализ документов, исследование обобщает международную эмпирическую литературу, публикации узбекских специалистов и правовую базу инклюзивного образования Узбекистана. Результаты показывают, что игры наиболее полезны в образовательном плане, когда они направлены на развитие четко определенного навыка, обеспечивают явное моделирование и обратную связь, адаптированы к коммуникативным и когнитивным профилям учащихся и оцениваются посредством выполнения аутентичных заданий. Данные, полученные в ходе испытаний серьезных игр, обнадеживают, но неоднородны и не могут быть обобщены на все типы игр или учащихся. В статье предлагается практическая модель внедрения и мониторинга для специальных и инклюзивных классов в Узбекистане; оригинальные экспериментальные данные не приводятся.

Ключевые слова: интеллектуальные нарушения; дидактические игры; специальное образование; инклюзивное образование; когнитивное развитие; Узбекистан.

Introduction

Didactic games are structured play activities with explicit educational goals, rules, learning materials and feedback. For learners with intellectual disabilities, these activities may offer repeated, meaningful opportunities to practice sorting, counting, communication, memory, turn-taking and everyday decisions. Their value is not simply that lessons become entertaining: an effective game connects observable actions to a curriculum objective and supports gradual independence. Intellectual disability encompasses diverse levels of intellectual and adaptive functioning; consequently, instructional plans must be individualized rather than based on a single diagnostic label.

The policy relevance of accessible instruction is clear in Uzbekistan. Article 20 of the Law “On Education” establishes inclusive education with attention to individual capabilities and special educational needs [1]. Presidential Resolution No. PQ-4860 sets measures for improving education for children with special educational needs [2]. Cabinet of Ministers Resolution No. 638 approves regulations concerning inclusive education in general schools [3]. These legal instruments support educational access and adaptation; they do not themselves establish the efficacy of any particular didactic game.

The need for practical approaches is reinforced by recent national initiatives. UNICEF described joint work with Uzbekistan’s Ministry of Preschool and School Education to develop inclusive digital schools and train leaders from 50 pilot schools in 2025 [4]. This development makes it timely to distinguish accessible educational games from untested technological novelty.

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Research objective: to analyze the benefits, constraints and implementation conditions of didactic games for learners with intellectual disabilities and formulate an evidence-informed classroom model applicable to Uzbekistan.

Materials and Methods

Design. This is a structured narrative literature review with qualitative comparative analysis of policy and research publications, not a randomized trial or a systematic review with exhaustive database coverage. Sources were selected for direct relevance to intellectual disability, educational games, special pedagogy and Uzbekistan's education system. Priority was given to peer-reviewed international reviews and studies from 2022–2025, official Uzbek legislation and authoritative institutional publications. A relevant Uzbek-authored pedagogical paper from 2024 was included to represent local scholarship.

Analysis procedure. Each source was examined for (a) population and educational setting, (b) game type, (c) targeted learning domain, (d) evidence of effectiveness, (e) limitations and (f) transferability to Uzbek classrooms. Findings were synthesized thematically rather than pooled statistically. Because studies frequently combine learners with intellectual disability and autism spectrum disorder, outcomes are identified as mixed-population evidence where applicable. No participant data were collected, and no new intervention effect sizes were calculated.

Results

Evidence from international research. A meta-analysis of 11 randomized controlled trials involving 654 children with intellectual disability and/or autism spectrum disorder reported a small positive overall effect of serious games on adaptive and cognitive skills (Hedges' g = 0.420; 95% CI 0.130–0.710), with moderate-to-high heterogeneity [5]. This is promising but does not demonstrate that all games work equally well, or that the effect applies exclusively to children with intellectual disabilities. A 2024 systematic review of computer-assisted reading instruction identified 47 eligible studies involving autism and/or intellectual disability, highlighting the diversity of reading programs and the importance of implementation conditions [6].

Subject-specific applications. Bober, Kosenko and Korol (2024) described the design of an interactive website with didactic games aimed at vocabulary development in younger learners with intellectual disabilities [7]. This provides a relevant design example, although the description of a tool should not be equated with definitive proof of learning gains. In Uzbekistan-related scholarship, Tagonova (2024) discussed didactic games for developing elementary mathematical concepts, including number, quantity, geometric shapes, space and time, among primary school pupils with intellectual disabilities [8]. These contributions support the selection of language and numeracy as priority instructional targets, while the strength of each claim must be judged against the underlying study design.

Practical instructional model. Across the reviewed literature, useful game features include short and predictable rules, concrete or pictorial materials, repeated practice, immediate informative feedback, progressive task difficulty and opportunities to use the skill outside the game. The following matrix is a proposed teaching framework synthesized from the literature, not results from a new field experiment.

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Table 1. Proposed didactic-game activities and measurable outcomes (author's synthesis).

Target skill	Example didactic game	Adaptation	Observable indicator
Attention and classification	Sort picture/object cards by one feature	Begin with two categories; use prompts then fade	Correct independent sorts across sessions
Early numeracy	Match quantities to numeral cards	Use manipulatives and small number ranges	Accurate counting in class and daily tasks
Vocabulary and communication	Name–match–request picture game	Offer symbols, gestures or AAC choices	Spontaneous functional requests and naming
Working memory	Remember a short picture sequence	Increase sequence length gradually	Accurate recall after a brief delay
Social participation	Turn-taking board game	Visual turn cue and explicit role modeling	Turns taken and appropriate peer responses
Daily living skills	Simulated shopping with objects/tokens	Practice real objects before abstraction	Transfer to supervised practical routines

Assessment. A feasible monitoring approach is to record baseline performance, teach a specific skill through repeated sessions, and compare subsequent independent performance using the same scoring rules. Suggested indicators include percentage of correct responses, number of prompts required, time on task, frequency of functional communication and generalization to ordinary classroom or home routines. Records should distinguish improvement in game performance from transfer to everyday functioning.

Discussion

Didactic games should be understood as instructional tools rather than stand-alone therapies. Their principal pedagogical advantages are opportunities for repeated practice, visible feedback, shared attention, differentiated challenge and active participation. However, poorly designed games may overload attention, reward guessing instead of understanding, or create dependence on adult prompting. Competitive formats may also discourage learners who require more time. Games should therefore be selected for developmental appropriateness, accessibility and the learner's preferences.

Digital games can supply audio-visual prompts and automated repetition, but they introduce additional barriers: device cost, screen accessibility, language availability, teacher training, data privacy and potential distraction. Low-cost tangible games—matching cards, number objects, picture schedules and role-play—remain

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valuable, especially when connectivity or equipment is limited. Technology should be chosen because it improves access to a specified learning goal, not because it appears modern.

A staged instructional cycle is recommended:

1) identify one functional target;
2) assess the learner's starting point;
3) select a suitable game and accessible response mode;
4) model the rules;
5) use short guided sessions with systematic prompting and feedback;
6) gradually reduce assistance;
7) check retention and transfer in a non-game setting; and
8) revise the plan with teachers and caregivers.

Cooperation between special educators, classroom teachers, psychologists, speech-language professionals where available, and families helps maintain consistent expectations across environments.

The international evidence has important limitations. Some syntheses group different disability categories, ages, game technologies and outcome measures; the resulting heterogeneity reduces certainty about which intervention works best for a particular learner. Uzbek pedagogical publications provide contextually relevant ideas but do not automatically establish causal effectiveness. The present article is also limited by its narrative selection of literature, lack of primary classroom data and absence of a formal risk-of-bias assessment across all included sources. Future Uzbekistan-based studies should compare clearly specified game-based lessons with usual instruction, document learner characteristics, measure maintenance and generalization, and report adverse or unintended effects.

Conclusion

Didactic games can be a practical component of individualized education for learners with intellectual disabilities when they are linked to explicit academic, communicative, social or adaptive goals. Current research supports cautious optimism, especially for structured and feedback-rich activities, while showing that effects vary across interventions and learner groups. For Uzbekistan, the most defensible approach is to combine the country's inclusive-education commitments with teacher preparation, accessible low-cost materials, appropriate digital tools and ongoing measurement of meaningful learning outcomes. The ultimate indicator of success is not how well a pupil plays a game, but whether the learned skill supports greater independence and participation.

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