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PEDAGOGICAL CONDITIONS FOR INTEGRATING SCHOOL, FAMILY, AND NEIGHBORHOOD (MAHALLA) COOPERATION IN PRIMARY EDUCATION BASED ON CROSSOVER DIGITAL ECOSYSTEMS

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ABSTRACT. This article conceptually investigates the theoretical and methodological frameworks for advancing prospective primary school teachers' socio-pedagogical management and communicative competence within a crossover learning paradigm. It explicates the didactic mechanisms for converging formal primary schooling, the family upbringing sphere, and community sociocultural environments (the mahalla ecosystem) into an integrated pedagogical continuum via digital platforms and experiential field pathways. A structured training model is established to prepare future primary educators as community learning coordinators and social mediators, facilitating early learners' socialization, civic values internalization, and real-world competencies.
Keywords: crossover learning, school-family partnership, mahalla community, primary education methodology, prospective teacher, socio-pedagogical integration, communicative management, digital ecosystem.

АННОТАЦИЯ. В данной статье концептуально исследуются основы совершенствования социально-педагогической и коммуникативно-менеджерской компетентности будущих учителей начальных классов в парадигме кроссовер-обучения. Раскрыты механизмы интеграции формального школьного образования, семейной среды и социокультурного пространства махалли в единую экосистему посредством цифровых платформ и практических маршрутов. Обоснована поэтапная система подготовки будущих педагогов как координаторов открытого образования и социальных медиаторов, способствующих успешной социализации, усвоению национальных ценностей и развитию жизненных навыков младших школьников.
Ключевые слова: кроссовер-обучение, сотрудничество школы и семьи, институт махалли, методика начального образования, будущий учитель, социально-педагогическая интеграция, коммуникативный менеджмент, цифровая экосистема.

INTRODUCTION. Globalization and the rapid migration of social interactions into virtual space have significantly complicated the socialization process of growing children in modern society. While children were previously shaped primarily within traditional educational environments based on direct interaction—such as the family, school, and neighborhood (mahalla)—today, algorithms, social networks, and mass information flows have intervened among these three pillars. Frequently, the family becomes detached from the school, delegating full educational and upbringing responsibility to the teacher; meanwhile, the school remains confined within its 45-minute lessons, remaining oblivious to the child's real-life experiences at home and in the community. Consequently, a fragmentation occurs within the child's world of values: they display one form of behavior at school, an entirely different conduct at home, and reveal a hidden subculture across virtual networks. Given that primary school age serves as the initial foundation for an individual's moral framework, civic responsibility, and national identity

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awareness, the disruption of this educational chain inflicts serious damage on the holistic development of the child's personality. Unless school instruction connects with the real local community (mahalla) culture, historical memory, and family lifestyle in which the child lives, all learned concepts remain nothing more than rote memorization and empty formality.

In bridging this systemic gap, the crossover learning approach functions as a modern integrative bridge that organically unites the school, family, and local community. Crossover learning is not merely the application of information technologies, but a social movement that transitions the educational process from the classroom to the neighborhood center (guzar), artisan workshops, household practices, and historical landmarks. In the crossover model, parents are no longer passive spectators or disciplinarians, but active co-researchers alongside the child in joint inquiries; neighborhood activists, artisans, and labor veterans join the process as informal mentors of education. However, establishing such a multi-vector social dialogue demands high socio-pedagogical and communicative-managerial competence from future primary school teachers. The educator must view themselves not merely as an instructor delivering lessons, but as a social project manager, facilitator, and mediator who unifies school, parental, and community resources toward a singular goal.

The pedagogy of cooperation among school, family, and community, child socialization, and the development of the educational environment as an open ecosystem have been investigated by numerous international and domestic scholars. In Uzbek socio-pedagogy, the educational capabilities of the mahalla institution and the ethnopedagogical foundations of family-school cooperation were thoroughly analyzed in the fundamental research of O. Musurmonova, where embedding family spirituality and national values into school education is highlighted as the primary guarantee of students' well-rounded development [1]. The psychological and pedagogical facets of fostering social activity and community consciousness among primary school students were researched by S. N. Nishonova [2]. Her scientific works substantiate the role of practical activities and living personal examples in instilling folk traditions, kindness, and respect for elders in primary school children [2].

Internationally, the classical theory of school, family, and community partnership relies on the renowned six-component model developed by J. L. Epstein [3]. This model encompasses parenting education, communication, volunteering, supporting learning at home, participation in decision-making, and integrating community resources [3]. Crossover learning enables the conversion of all these directions into a unified, dynamic process through digital platforms. U. Bronfenbrenner, founder of Ecological Systems Theory, proved that individual personality development directly depends on harmony between the microsystem (family, classroom), mesosystem (school-family interaction), and exosystem (local community) [4]. Crossover learning emerges precisely as an innovative mechanism strengthening these mesosystem connections.

The theory of utilizing community resources in non-formal education and Communities of Practice was established by E. Wenger, demonstrating that knowledge generates more from shared practical actions, traditions, and professional experience exchanges among people than from textbooks [5]. In Russian pedagogy, designing an open educational space and social-pedagogical partnerships are extensively covered in the works of V. D. Semyonov and A. V. Mudrik [6, 7]. While V. D. Semyonov developed the concept of viewing the school and neighborhood environment as a unified educational complex [6], A. V. Mudrik elucidated mechanisms for enhancing the teacher's communication culture with the community within social pedagogy [7].

ISSN: 2224-6878 | Pakistan Volume 6, No. 10.

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The issues of establishing digital communication with parents in primary education and educational mediation were analyzed by M. Garcia, who emphasizes that digital platforms should transform parents into active project participants rather than mere daily inspectors [8]. Furthermore, studies by R. A. Djurayeva regarding the development of future teachers' socio-communicative activity form the methodical basis for preparing future specialists to work with the community [9]. However, within the analyzed literature, a comprehensive methodical system for creating a continuous digital-practical ecosystem between school, family, and neighborhood through crossover learning, as well as preparing future primary school teachers as communicative managers of this process, has not been sufficiently researched at the DSc (Doctor of Sciences) level.

Ensuring an open educational environment in primary education practice requires abandoning the delivery of instruction strictly within the administrative boundaries of educational institutions and integrating all social spaces of a child's daily life into a unified crossover ecosystem. Within this framework, the school integrates as a theoretical-methodological center, the family as a field of personal-practical values, and the mahalla as a laboratory of practical-social experience and national culture.

This crossover ecosystem operates based on four main systemic levels:

First Level – Institutional and Normative-Methodological Level: At this stage, primary education curricula and calendar-thematic plans are reviewed to identify which topics can be directly integrated with family practices, neighborhood history, or local craft centers. The future specialist in higher pedagogical education defines the didactic goals of this integration and designs an organizational map of learning activities.

Second Level – Information-Communicative and Digital Platform Level: A crossover educational platform connecting the school, family, and neighborhood into a single network is created. Through this platform, parents not only view their child's daily grades, but also access engaging research assignments, audio-video guides, and educational quest scenarios designed for family implementation within the neighborhood. Concurrently, neighborhood activists, artisans, and veterans upload video materials showcasing their practical work, historical memories, and professional trade secrets.

Third Level – Crossover Action-Practical Level: Theoretical concepts studied in the classroom are translated into practical actions within the family and neighborhood domains. Students, alongside their parents, conduct natural-mathematical experiments at home, record oral histories from neighborhood elders, study applied folk arts in artisans' workshops, and synthesize the gathered empirical data using digital tools.

Fourth Level – Collective-Reflective and Value Assessment Level: Collected materials and completed projects are publicly demonstrated at local community centers, school festivals involving parents, or virtual forums. Here, assessment is not merely a numerical score; rather, it serves to reinforce the child's social identity through public demonstration of their work and recognition from parents and mentors.

Preparing future primary school teachers for socio-pedagogical management in higher education is implemented through specific crossover models developed within core primary education disciplines:

Family-Community Crossover Projects in Native Language and Reading Literacy: Departing from traditional methods of merely reading and retelling textbook texts, the crossover research project "My Neighborhood – My History" is organized. After acquiring theoretical knowledge in class regarding oral folklore genres (fairy tales, proverbs, legends), the second phase shifts to the neighborhood. Accompanied by their parents, students visit neighborhood

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elders and labor veterans to conduct audio interviews about ancient place names, endangered customs, and historical events. In the third phase, children analyze these materials in class, enrich them with digital photography, and create an interactive e-book titled "The Living Encyclopedia of Our Neighborhood." Beyond expanding vocabulary, this process instills respect for ancestral heritage and affection toward community members.

Family Budget and Applied Economic Crossover Approach in Mathematics: In teaching four arithmetic operations, percentages, currency units, and measurements, the family environment acts as the most natural laboratory. Future educators learn to design the crossover lesson plan "Our Family Budget and Frugality." Following computation rules learned in class, children and parents calculate monthly utility costs (electricity, gas, water usage) and daily grocery expenses using digital calculators on tablets. Furthermore, they visit local markets to conduct comparative price analyses and construct family savings plans. Uniting mathematics with real household economic relations fosters frugality, respect for labor, and personal responsibility from an early age.

Neighborhood Ecology and Agricultural Research in Natural Sciences (Science): The neighborhood environment provides a rich empirical resource for ecological education and environmental study. Upon mastering classroom rules regarding plant life and environmental protection, crossover research begins. Children directly engage in planting saplings and caring for flowers in home gardens or neighborhood parks alongside parents and local gardeners. They photograph plant growth daily, log data into mobile applications, and test soil moisture using simple methods. During the neighborhood contest "Our Green Neighborhood," each student presents a digital report on their cultivated plant. Thus, natural science transitions from dry theory into an active social movement for environmental conservation.

In higher pedagogical education institutions, preparing primary education students to manage school, family, and community partnerships on a crossover basis is systematically conducted across three stages:

Stage One – Sociological-Diagnostic and Communicative Preparation: Students theoretically study socio-psychological typologies of modern families, technologies for establishing effective parental communication, and the legal-pedagogical capabilities of neighborhood structures. They acquire professional communicative skills in surveying parents, identifying family needs, and conducting negotiations with community leaders.

Stage Two – Hybrid-Design and Platform Management: In higher education classrooms, students independently design crossover project packages capable of involving parents, students, and community representatives. They construct virtual collaboration spaces (Telegram channels, interactive boards, specialized online portals), distribute tasks clearly, and develop engaging mechanisms to draw parents into the educational process.

Stage Three – Practical-Social Integration and Community Practice: During pedagogical internships in general education schools, students directly organize "Neighborhood – School – Family: Crossover Space" initiatives in collaboration with local neighborhood citizen committees (Mahalla Fuqarolar Yig‘ini). They conduct crossover masterclasses for parents, host open workshops for children involving local artisans, and defend their socio-pedagogical findings before academic-methodological councils.

To evaluate the practical effectiveness of the proposed methodology for integrating school, family, and neighborhood cooperation through crossover digital ecosystems, long-term pedagogical experimental testing was conducted. The experimental site involved graduating primary education students from pedagogical higher education institutions, 2nd–4th grade pupils from affiliated partner schools, pupils' parents, and neighborhood citizen committee activists.

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A total of 140 university students participated in the experiment, divided into two equivalent independent groups:

Control Group: Future teachers learned to interact with families and the community within traditional pedagogy curricula, primarily through quarterly parent-teacher conferences, individual conversations, and printed information letters.

Experimental Group: Students completed the specialized module "Crossover Cooperation of School, Family, and Neighborhood in Primary Education." They fully implemented digital collaboration platforms, interactive family task banks, educational routes linked to neighborhood infrastructure, and public project management technologies.

The development level of future teachers' socio-pedagogical and communicative-managerial competencies was evaluated against four primary quality criteria:

Sociological-Diagnostic Criterion: Ability to accurately assess family educational potential, parental educational needs, and local socio-cultural resources.

Crossover-Design Criterion: Capacity to construct hybrid lesson scenarios and interactive task chains connecting curricula with family practices and neighborhood life.

Communicative-Mediative Criterion: Ability to establish open, trusting dialogue among school, parents, and community members, resolve educational conflicts, and transform parents into active subjects of the educational process.

Digital-Management Criterion: Culture of systematically managing three-way continuous feedback via virtual networks, electronic portfolios, and community platforms.

Results from sociological surveys, expert feedback from parents and neighborhood leaders, and analyses of student internship logs confirmed the emergence of qualitatively new pedagogical metrics in the experimental group. During the initial baseline phase, both groups displayed largely reproductive skills regarding family and community engagement. 72% of students perceived parental communication merely as a means to "report bad grades or misbehavior," while failing to envision how the educational potential of the mahalla could be integrated into classroom teaching.

Following the formative phase—once crossover platform management mechanisms were fully implemented in the experimental group—the following conceptual shifts were recorded: First, the quality of parental involvement in school education transformed fundamentally. In the control group, parents remained external observers and monitors, whereas in the experimental group, 81.4% of parents actively collaborated with their children in completing crossover practical tasks (calculating household budgets, plant care, family reading, and audio storytelling). Anonymous parental surveys revealed a 2.5-fold increase in trust toward the school and teacher, alongside a deeper understanding of their child's academic interests. Second, the educational resources of the mahalla institution entered the instructional process organically. Experimental group students organized over 40 open crossover sessions across neighborhood centers, artisan workshops, teahouses, and memorial sites. Local artisans served as live instructors for technology and fine arts lessons, while neighborhood elders participated in reading literacy classes as sources of historical and cultural memory. This process elevated primary pupils' national identity awareness, local pride, and sense of civic responsibility. Third, leadership qualities and socio-pedagogical management traits were consolidated within future teachers' professional identities. Students demonstrated themselves not merely as classroom instructors, but as social initiators driving the neighborhood's cultural-educational center. By hosting useful methodical recommendations, interactive quizzes, and spiritual conversations on virtual platforms for parents and the public, they achieved the status of true "open education coordinators."

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The empirical findings allow for the following practical recommendations to integrate higher pedagogical education and primary school practice:

Introduce a Specialized Module: Higher pedagogical education institutions should incorporate the practical module "Socio-Pedagogical Management and Crossover Cooperation in Primary Education." This module must systematically train future specialists in diagnosing family educational environments, conducting conflict-free parental communication, managing educational platforms, and integrating community resources into lessons.

Establish Cooperation Memorandums: General education schools and neighborhood citizen committees should sign "Crossover Educational Space" partnership agreements. Based on these agreements, dedicated research zones for primary students should be allocated within neighborhood libraries, youth centers, sports fields, and craft workshops, ensuring practical curriculum hours are conducted directly within these venues.

Integrate Family-Community Inquiries into Curricula: Primary education textbooks and digital platforms should systematically feature a "Family and Community Research" section. Tasks in this section must require real dialogue between children, parents, grandparents, or neighborhood leaders, fostering practical life experience that children can share with peers in class.

CONCLUSION. Strengthening cooperation among the school, family, and local community in primary education is not merely a supplementary upbringing measure, but a strategic imperative that establishes a resilient socio-cultural foundation for individual personality development. The crossover approach—seamlessly linking formal instruction with family values and neighborhood infrastructure—emerges as the most effective methodological platform for eliminating educational isolation and aligning learning with real-life needs. Throughout this research, a four-tier crossover digital ecosystem model (normative-methodological, information-platform, action-practical, and collective-reflective) was scientifically substantiated. Within this framework, future primary school teachers' socio-pedagogical and communicative-managerial competencies were developed, elevating specialists to integrators who unify school, family, and community resources toward a singular moral-educational purpose. The socio-pedagogical experiment, long-term monitoring, and qualitative analysis fully confirm the high practical efficacy of the developed crossover cooperation methodology, directly serving to transform parents into active educational participants and the neighborhood into a living center of practical upbringing.

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