

“4Cs” COMPETENCES OF THE 21st CENTURY IN THE CONTEXT OF THE STATE STANDARDS OF PRESCHOOL EDUCATION OF THE RA

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ABSTRACT

In an era of chaotic changes and unpredictable crises, society needs individuals who can navigate real-life situations and make decisions. The competency-based approach in preschool education provides preschoolers' individual potential development in the formation of 21st-century competences, which will teach a child from an early age to act independently in various problem-based situations.

The key competences of the 21st century are not only knowledge and skills, but also a value-based attitude towards the world and personal qualities that help individuals successfully realize themselves in the context of teamwork and cooperation. Within the framework of the 21st century key competences, countries adapt universal skills to the specific goals of their national education systems.

The analysis of competences presented in the State Standard of Preschool Education of the Republic of Armenia will allow us to identify their correspondence to the basic competences of the generally accepted “4Cs” model, to define the strengths and weaknesses of the state standard and to formulate a matrix for the holistic development of a future citizen of Armenian society—a personal vision of the “educated person”.

Preschool education implies:

- *to explore the surrounding environment independently and perceive the world holistically,*
- *to communicate and respond adequately, empathize, forgive, and live in harmony with others,*
- *to control own behavior and form identity,*
- *to think creatively, discover new things through the search for non-standard, alternative solutions,*
- *to value national culture and embrace universal human values,*
- *to feel a sense of belonging to one's nation and country.*

KEY WORDS: State Educational Standard of Preschool Education of the Republic of Armenia, key competences of the 21st century, “4Cs” model, comparative analysis.

INTRODUCTION

At present, two processes are happening simultaneously in education: the clarification of universal 21st century competences and the transformation of national education systems in accordance with the urgent problems of each country and the international challenges of the labor market. The content of education is developed depending on the 21st century key competences and the subsequent revision of education system standards, particularly school education (Dobryakova, M. S. & Frumin, I. D., 2020).

The competency-based model of education is currently the most widely recognized internationally. It allows for the revision of key competences and, consequently, guides the selection of educational content towards the development of new literacy/educational foundations.

The bases of education are formed in preschool age. The process of upbringing, rather than formal teaching, reveals the individuality and uniqueness of each child, prioritizing human values and qualities, love, and dignity.

Nobel Prize laureate James Heckman (Hackman D. A., Farah M. J., 2009) demonstrated that the return on investments in preschool socialization programs is significantly higher than that of investments in school and professional education programs. The exceptional importance of preschool education in the formation of competences is also emphasized by Alexander Adamsky, Scientific Director of the Institute for Educational Policy “Eureka”:

“Preschool education can rightfully take a central place in the education system, because today there is a well-established opinion among experts that even key professional competencies are formed during preschool and early school years — from the ability to work in a team to the development of imagination and creativity. If these abilities are not formed at this age, no university can make up for this gap later” (Borzova, I. G., 2022).

The key competences of the 21st century were proposed by the international UNESCO commission led by former President of the European Commission Jacques Delors (Delors, J. (Ed.), 1996). He outlined four fundamental principles as the basis of the 21st century education: *learning to live, learning to know, learning to do, and learning to coexist*.

The report, prepared for UNESCO by an independent commission, strongly urged allocating more resources to education both in individual countries and worldwide, and strengthening international

cooperation in this field. The commission believed that a more flexible system—providing diversity of courses, organic links between professional experience and skills development—would adequately address the gap between labor market demand and supply of specialists. Flexibility, diversity, and accessibility of education in time and space allow individuals to understand themselves and their environment and to fulfill their social role in work and community life.

In other words, education has a social character: during the process, children discover and enrich relationships with others, and acquire the skills of living together. This process must begin in preschool age and take various forms depending on the situation, with active involvement of both family and society.

The “4Cs” competence model, which includes four core competences according to international understanding—**critical thinking, creativity, communication, collaboration**—is the structural nucleus of 21st-century competences, upon which national education standards are built.

The “4Cs” model, developed in the early 21st century within the initiative *Partnership for 21st Century Skills (P21, USA)*, represents four competences that are considered fundamental meta-competences enabling individuals to function effectively under conditions of uncertainty, innovation, and digitalization (Trilling & Fadel, 2009; P21, 2019). These competences are seen as the foundation for forming skills such as digital literacy, leadership, self-organization, and civic responsibility (OECD, 2018).

Modern researchers (Fullan & Scott, 2014) consider the 4Cs as fundamental competences for designing “deep learning pedagogies” aimed at developing critical thinking and creative self-realization of students.

The 4Cs model serves as a bridge between traditional cognitive knowledge and socio-emotional skills, ensuring the transition from a knowledge-centered paradigm of education to a competency-based one, focused on the development of personality as an active subject of activity and communication.

Modern studies emphasize that the formation of basic 21st-century competences begins in preschool age (OECD, 2018). Theoretical justification for this is provided by Vygotsky’s cultural-historical approach, D. B. Elkonin’s theory of play as the leading activity, and research by Trilling & Fadel.

According to the cultural-historical approach (Vygotsky, L. S., 1984), a child’s development is mediated by social interaction, meaning that communication and collaboration become the driving force of development and learning.

Play activity (Elkonin, D. B., 1989) creates unique conditions for the natural development of creativity, initiative, and problem-solving ability. Through joint play and communication, children learn to negotiate, propose ideas, critically evaluate situations, and find alternative courses of action—that is, to master the first forms of 4Cs competences (Trilling & Fadel, 2009).

The formation of the 4Cs at preschool age occurs primarily in integrated educational situations, where the child acts as an active participant in interaction with the surrounding world. Research shows that the use of play and project-based learning contributes to the development of cooperation and communication skills, while the organization of research activities fosters critical and creative thinking (Fullan & Scott, 2014). Thus, preschool age can be regarded as a sensitive period for the formation of the 4Cs meta-competences.

From birth to school, considering the importance of forming socio-behavioral skills such as the ability to communicate, negotiate, and avoid conflict, the preschool educational process should focus on the development of independence, responsibility, emotionality, and civic sense. The emphasis of modern education on the formation of socio-behavioral competences is a demand of the time.

Thus, in shaping the education and competence of preschoolers, the leading role belongs to the Preschool Education Standard. The main principle of this document is to take into account the educational needs of the modern preschool child in the context of informational socialization. The Preschool Education Standard should give children the opportunity to realize their individuality by expanding their personal potential and forming vital competences.

The State Standard of Preschool Education represents a set of state guarantees and requirements for programs, conditions, and outcomes of quality education. The quality of preschool education is assessed based on the formulation of predetermined basic competences.

In the State Educational Standard of Preschool Education of the Republic of Armenia, the key competences are identified according to the following principles:

- correspondence to the 21st century key competences,
- continuity – consideration the competences of primary education,
- enrichment of competences with value and meaning.

The State Educational Standard of Preschool Education of the Republic of Armenia (2024) presents **nine competences**:

1. Linguistic and communication competence.
2. Cognitive and motivational competence.
3. Self-knowledge and socialization competence.
4. Democratic and civic competence.
5. Digital and media competence.
6. Cultural competence.
7. Mathematical and technical competence.
8. Economic competence.
9. Physical culture and health maintenance competence.

MATERIALS AND METHODS

The article presents an analysis of the theoretical foundations for identifying the basic competences of the 21st century, substantiates the importance of forming key competences beginning in preschool age, and highlights the necessity of considering universal 21st century competences when developing state educational standards.

The article also reveals the system of preschool children's competences, which is a distinctive feature of the 2021 State Educational Standard of Preschool Education of the Republic of Armenia. The principles underlying their identification are characterized, and a comparative analysis is carried out regarding their correspondence to the "4Cs" competence model.

In the research process, empirical methods were used: theoretical analysis of scientific sources, questionnaires, and interviews.

Generally accepted views on the four basic competences (**critical thinking, creativity, communication, collaboration**) are fundamental both for describing their manifestations and for determining the degree of their formation.

- **Critical thinking** – a system of cognitive strategies and communicative qualities that enable effective interaction with informational reality.
 - **Creativity** – the result of innovative thinking, a new way of understanding and perceiving things, and the ability to act unconventionally.
 - **Communication** – the ability to express and interpret thoughts, feelings, and facts, and to communicate in various social and cultural contexts.
 - **Collaboration** – readiness and ability to work in a team: to ask for help, to listen to others' opinions, to agree with alternative proposals, to define one's own contribution, and to evaluate the collective result as one's own.
1. The basis for understanding critical thinking is the approach formulated in the works of **K. Popper** (Popper, K. R., 1994): *we learn from mistakes, not through the accumulation of data*. The best condition for critical thinking is the social situation of communication and interaction: *"You and me may be wrong, but together we can gradually approach the truth"* (Popper, K. R., 1966, p. 225). Critical thinking develops through active interaction, exchange of opinions, and critique in the process of joint learning.
 2. In assessing creativity/creative thinking, the guiding framework is **B. Lucas's model** (Lucas, B., 2016). Lucas defines creativity as a set of *habits of mind* that are manifested in actions and can be purposefully formed through learning. He identifies **five key dimensions of creativity**:
 - **Curiosity** – the ability to ask questions, explore, and notice new opportunities.

- **Imagination** – the ability to envision the new, play with ideas, and mentally model different possibilities.
 - **Persistence** – the readiness to overcome difficulties and patiently work on an idea.
 - **Discipline** – organization, attention to detail, and the ability to develop and implement ideas.
 - **Collaboration** – openness to teamwork, idea exchange, acceptance of one's own mistakes and others' viewpoints.
3. Communication and collaboration are easier to describe than the other components of the “4Cs” since these skills manifest externally and are therefore easier to observe. The ability to work in a team, interact, and cooperate is considered one of the key elements in the competence system of the **State Educational Standard of Preschool Education of the Republic of Armenia**.

The structure of communicative competence includes:

- **Readiness for communication:** absence of fear when entering into communication, initiation of communication, readiness to respond to someone else's question, readiness to ask questions.
- **Adaptation to the purpose, context, and communication partner:** in various communicative situations, the ability to choose different verbal and non-verbal means of communication, guided by the emotional state of the partner.
- **Persuasive communication:** the use of verbal (vocabulary and knowledge of language rules) and non-verbal means (gestures, facial expressions, intonation) to achieve the communication goal.

The structure of collaboration (cooperation) includes:

- **Acceptance of common goals:** the ability to share the goals of the team and place them above personal goals, work in a team, integrate one's work into the collective solution, and manage one's emotions in teamwork.
- **Social interaction:** participation in discussions, the ability to negotiate, interact respectfully, listen and accept the opinions of others, coordinate one's actions with those of other team members; willingness to help them; readiness to take responsibility for the overall result.
- **Fulfilling commitments:** readiness to take on a position and assume a role that is effective for teamwork; responsible performance of one's part of the work, achievement of a quality result.
- **Independence and initiative:** the ability to work independently and show initiative within the framework of the assigned task; the ability to involve all team members in solving the task, provide them with support, and motivate them.

The experiment involved 100 preschool educators, whose opinions were taken into account during the process of grouping the competences.

RESEARCH RESULTS AND DISCUSSION

Since the objective of our research was to study the correspondence between preschool children's competences presented in the State Educational Standard of Preschool Education of the Republic of Armenia and the universal competences of the 21st century—particularly the “4Cs”—that is, to determine the compatibility of preschool competences with 21st-century education competences, we considered it appropriate to present the comparative results in the form of tables and figures. These illustrate the degree of compatibility between preschool competences and the “4Cs”.

To provide a full picture of the emphases within the State Standard of Preschool Education of the Republic of Armenia, we first describe the structural components of the concept of “competence” according to the accepted definition in Armenia. The structural indicators demonstrate the priority given to social-behavioral competences.

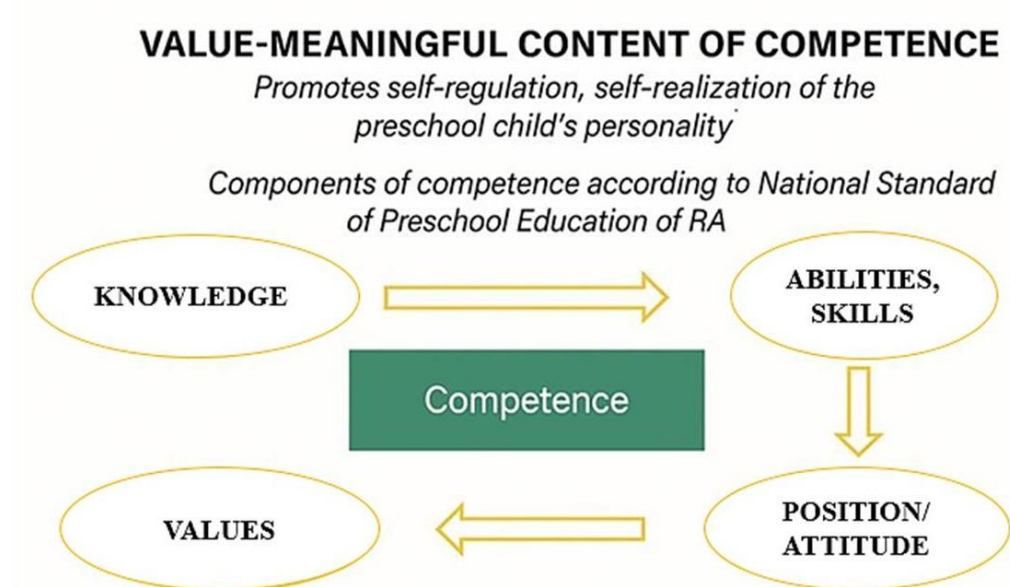


Figure 1. Components of the Concept of “Competence” According to the State Standard of Preschool Education of the Republic of Armenia

As mentioned in the introduction, the **State Educational Standard of Preschool Education of the Republic of Armenia** identifies nine competences which, in essence, correspond to the semantic content of the “4Cs” competences. However, it was necessary to group them in order to both facilitate their formation in practice and to provide educators with a clearer understanding of the final outcomes of preschool education as indicators of its quality.

Competences for preschoolers were also formulated in harmony with the competences proposed by **Jacques Delors**.

The competence of **critical thinking** can be presented as following (Table 1).

Competences of Critical Thinking The State Educational Standard of Preschool Education of the Republic of Armenia	General Characteristics of the State Standard Competences	Characteristics of Critical Thinking in the “4Cs” Model
1. Linguistic and Communicative Competence	The child participates in social life, demonstrating verbal activity. Easily uses speech structures in communication with adults and peers.	Curiosity, initiative, ability to explain the course of one’s thoughts.
2. Cognitive and Motivational Competence	The child shows cognitive interest in the world, natural phenomena, and human relationships. Engages in various types of activities on their own initiative.	Purposeful, self-regulated judgment; consistency of cognitive actions.
3. Self-Knowledge and Socialization Competence	Demonstrates cognitive activity. The child knows own strengths and weaknesses, is initiative-taking, constructive in communication, and is ready for cooperation.	Self-regulation (control), reflection, self-assessment, and correction.

Table 1. Critical Thinking Competence According to the State Educational Standard of Preschool Education of the Republic of Armenia

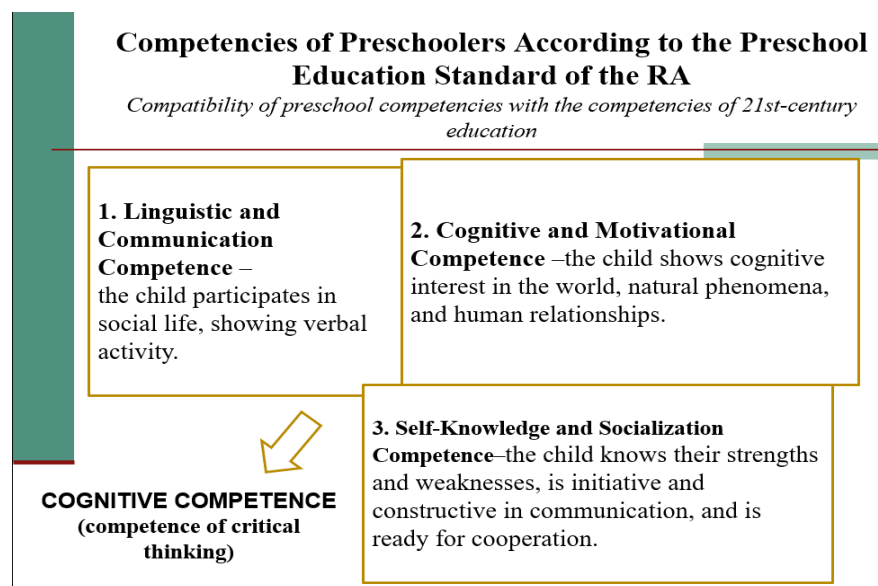


Figure 2. Components of Critical Thinking Competence / Cognitive Competence

Creative thinking competence can be presented as following (Table 2).

Competencies of Creative Thinking (State Standard)	General Characteristics of Competencies (State Standard)	Characteristics of Critical Thinking according to the "4Cs" Model
5. Digital and Media Competence	The child is able to navigate the media space, use basic media tools while following rules, being aware of risks and personal responsibility.	Curiosity, initiative, interest in the surrounding world and desire to learn more about it using media tools. Active search for new information.
7. Mathematical and Technical Competence	The child is able to solve problem-based tasks using mathematical knowledge and familiar technical tools.	Independent search for answers to own questions. Ability to generate a large number of ideas, originality of proposed ideas.
9. Physical culture and health maintenance competence.	The child understands and navigates the basic principles of a healthy lifestyle, demonstrates certain physical readiness and willpower in activities.	Ability to quickly adapt activities to changing conditions, readiness for new actions.

Table 2. Competence of Creative Thinking according to the State Educational Standard of Preschool Education of the Republic of Armenia

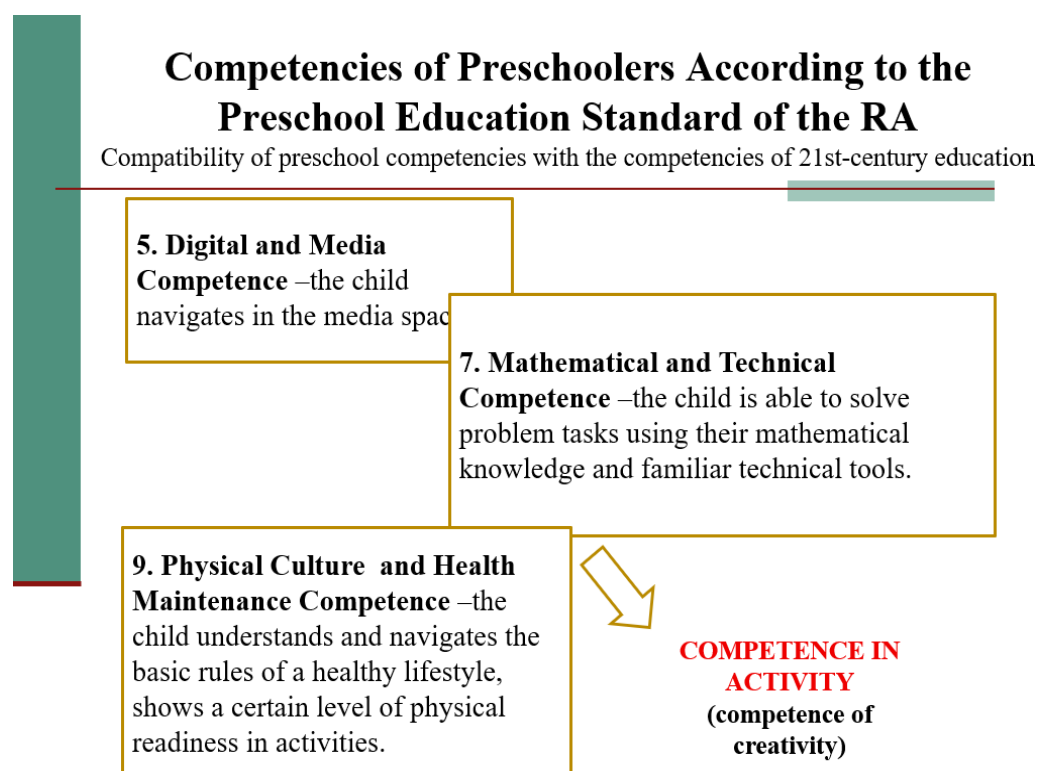


Figure 3. Components of Critical Thinking Competence in Activity

Communication and cooperation competences can be presented as following (Table 3).

Competencies of Communication and Cooperation (State Standard)	General Characteristics of Competencies (State Standard)	Characteristics of Critical Thinking according to the "4Cs" Model
4. Democratic and Civic Competence	The child knows the rules of decency and social justice,	In different communication situations, the ability to
	shows love and devotion to their country, knows its symbols, and has basic understanding of their rights and responsibilities.	choose verbal and non-verbal means of communication depending on the partner's emotional state. Ability to negotiate, interact respectfully, listen to and accept the opinions of team members. Readiness to help.
6. Cultural Competence	The child shows interest in artistic activity, shares emotions, feelings and impressions, distinguishes samples of national and world culture.	Ability to communicate effectively in various social and cultural contexts. Capacity to work independently and show initiative within a given task. Ability to involve team members in problem-solving, support and motivate them. Readiness to take such a position that is effective for teamwork. Use of verbal and non-verbal means to achieve communication goals.
8. Economic Competence	The child understands the role of each person in the development and improvement of the country, shows activity in environmental protection events. Able to discuss the results of their own and others' work.	Readiness to answer and ask questions. Ability to share the team's goals and put them above own goals, work in a team, integrate the results of own work into the collective solution, control emotions in teamwork.

Table 3. Competencies of Communication and Cooperation according to the State Educational Standard of Preschool Education of the Republic of Armenia

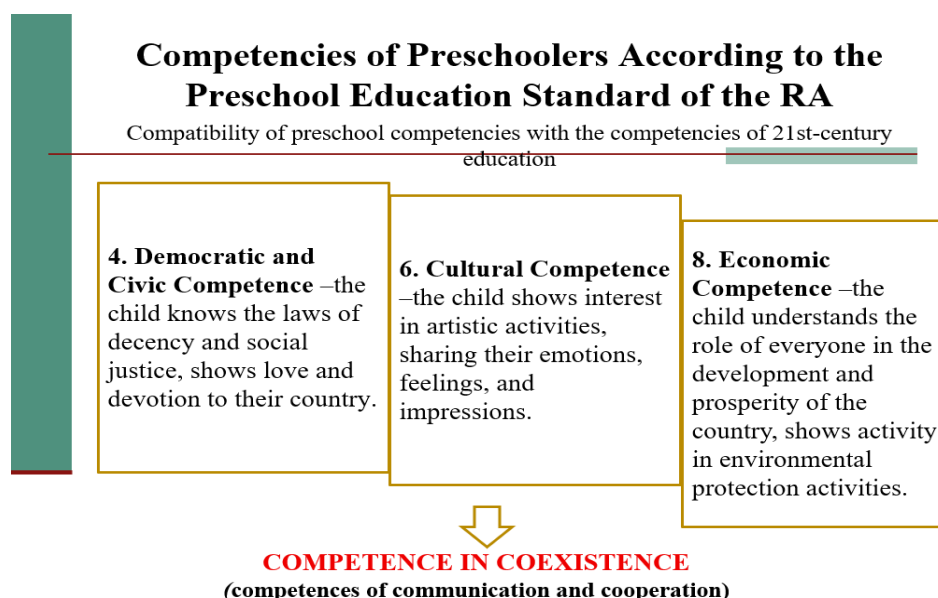


Figure 4. Components of Communication and Cooperation Competencies / Competence of Coexistence

Kindergarten teachers actively participated in the experiment, being involved in the process of grouping competencies in accordance with the “4Cs” competencies. At the end of the joint work, the teachers were asked to answer two questions:

1. Do the competences of the State Educational Standard of Preschool Education of the Republic of Armenia correspond to the key competencies of the “4Cs”?
2. How effective is the grouping of competences in terms of understanding their content?

Questions	Number of Respondents	Correspond	Partially Correspond	Do not Correspond
1. Compliance of the competences of the State Educational Standard of Preschool Education of RA with the key competences of the “4Cs”?	100	50 teachers – 50%	30 teachers – 30%	20 teachers – 20%
2. Effectiveness of grouping competences in understanding their content	100	70 teachers – 70% (Effective)	25 teachers – 25% (Partially effective)	5 teachers – 5% (Not effective)

The answers are presented in **Table 4.**

Table 4. Results of the Survey of Preschool Teachers

CONCLUSION

Analyzing the work carried out, the following should be noted:

- The formation of socio-behavioral competences from an early age is a challenge of the time; therefore, the competences presented in the national education standards should be identical to the key “4Cs” competences.
- The competences presented in the State Educational Standard of Preschool Education of the Republic of Armenia, in terms of values and meaning, do not differ from the competences of the 21st century: their content reflects the principles of education developed by the International Commission under UNESCO, with a clear emphasis on the formation of competences that reflect the effectiveness of interaction and teamwork.
- The competences presented in the State Educational Standard of Preschool Education of RA are formulated strictly based on the age characteristics of preschool children, and in their descriptions there are some inconsistencies with the key “4Cs” competences. However, the spirit of cooperation and the priority of communicative-cooperative competences are clearly visible.
- A stronger correspondence is observed between the key “4Cs” competences and the formation of the final results, presented in dynamics across the areas of preschoolers’ development.

Thus, the matrix of holistic development of the future citizen of Armenian society implies:

- the ability for independent cognition of the environment and holistic perception of the world,
- the ability to communicate and respond adequately, the capacity to empathize, forgive, and live in harmony with others,
- the ability to control behavior and form own identity,
- the ability to think creatively, discover the new through the search for non-standard, alternative solutions,
- the ability to value national culture and perceive universal human values,
- a sense of belonging to the nation and country.

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