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## Typology of competence characteristics of pupils with intellectual disabilities

### Типологія компетентнісних характеристик учнів з порушеннями інтелекту

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#### Abstract

The purpose is to develop a typology of competence characteristics of pupils with intellectual disabilities as a measure of a child's integration into educational activity. The following methods were applied: retrospective analysis and generalization; empirical measurement of relevant parameters of the research subject by means of valid and proprietary methods; k-means clustering, mathematical methods for data processing. The experiment participants: the total number (n=114) of the children from the first to the fifth grades: the pupils with intellectual disabilities (Group 1: n=57; 50.0%) and the pupils with normal development (Group 2: n=57; 50.0%). Key differences were found in the following competences of the research participants: intellectual-cognitive, emotional-motivational and social. It was established that deficiency of cognitive and adaptive skills, violation of social norms and limited communication prevail in the children with intellectual disabilities. Three types of competence characteristics in the pupils with intellectual disabilities in education were determined: Operational-Reproductive (ORT),

#### Анотація

Метою є створення типології компетентнісних характеристик учнів з порушенням інтелекту, як міри інтегрованості дитини в навчальну діяльність. Застосовано методи: ретроспективне аналізування і узагальнення; емпіричне вимірювання релевантних параметрів предмету дослідження за допомогою валідних і авторських методик; кластеризація методом k-середніх, методи математичної обробки даних. Учасники експерименту: загальна кількість (n=114) дітей з першого по п'ятий класи: учні з порушеннями інтелекту (група 1: n=57; 50.0%) та учні з нормотиповим розвитком (група 2: n=57; 50.0%). Виявлено ключові відмінності у таких компетентностях досліджуваних: інтелектуально-когнітивній, емоційно-мотиваційній і соціальній. З'ясовано, що дефіцит когнітивних та адаптивних навичок, недотримання суспільно прийнятих соціальних норм, обмежене спілкування є превалюючими в учнів з порушеннями інтелекту. Визначено три типи компетентнісних характеристик учнів з порушеннями інтелекту в навчанні:

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Limited-Practical (LPT), Limited-Fixed (LFT). The prospect is to create a conceptual model and correction-development program for the formation of key competences of pupils with intellectual disabilities.

**Key words:** education, psychology, intellectual and creative abilities, educational motivation, social knowledge and skills.

## Introduction

Implementation of a competency-based approach is an issue of global discussions closely related to modernization of Ukrainian education aimed at adjusting it to European and global standards.

The outlined modernization implies changes in a regulatory framework, scientific and educational-methodological regulations encouraging to determine guidelines for effective formation of an individual's key competences. Formation of key competences is a condition for a successful individual characterized by harmonious life activity and the ability to participate actively in solving social problems.

The noticeable changes occurring in the field of education of individuals with special needs outline a range of problems. These are organizational-content and methodological issues, the solution to which is aimed at ensuring the functioning of an effective system for education of such children under conditions of a competency-based approach. Such articulation of the outlined problems and the formation of key competences of children with intellectual disabilities require special attention, since these disabilities determine difficulties in the quality, intensity and content of social interaction of such children with a social environment. In its turn, it causes slow formation of key competences in such children and, as a result, failures in education and integration into an educational environment.

**Hypothesis.** The research on typological competence characteristics of pupils with intellectual disorders will allow making important scientific conclusions which should be considered by professionals working with children with special needs and operationalizing the results into educational teaching-methodological materials for professional training of future professionals.

Операційно-Репродуктивний (ОРТ), Обмежено-Практичний (ОПТ), Обмежено-Фіксований (ОФТ). Перспективою є розробка концептуальної моделі та корекційно-розвивальної програми формування ключових компетентностей учнів з порушеннями інтелектуального розвитку.

**Ключові слова:** освіта, психологія, інтелектуальні та творчі здібності, навчальна мотивація, соціальні знання та вміння.

**Purpose** is to develop a typology of competence characteristics of pupils with intellectual disabilities as a measure of a child's integration into educational activity.

## Literature review

Theoretical aspects of the research on a competency-based approach are thoroughly investigated and presented in the following directions: formation and development of a competency-based approach in education (Kremen et al., 2020; Lugovyi, 2020); examination of competences as a systemic manifestation of knowledge, skills, abilities and personality traits on the basis of activity-based and person-oriented approaches (Kostenko et al., 2022; Lokshyna, 2021; Voronov, 2021); practical realization of a competency-based approach in education was outlined in the studies by I. Halian et al. (2020), M. Mulder et al. (2006), I. Popovych et al. (2021a); the problem of the formation of key competences was investigated in the works by L. Prokhorenko et al. (2021). The authors agree that primarily changes should occur in the system of evaluation of the level of pupils' achievements when applying a competency-based model of education.

Conceptual foundations of the formation of life, basic and subject competences in children with special educational needs are given in the studies by M. Mulder et al. (2006). The scientists agree in the opinion that education of children with special educational needs on the basis of a competency-based approach implies an integral system of psychological-pedagogical support that should be aimed at preventing and overcoming life difficulties, challenges in education and socialization, correction of destructive tendencies in a child's development, harmonization of relationships with an environment.

In order to adjust regulations in the area of educational legislation of Ukraine, the concept “competency-based approach” was implemented into regulatory legal acts, in particular (Law No 1838-IX, 2021; Law No 2471-IX, 2022; Law No 764-IX, 13, 2020; Law No 2145-VIII, 2017), national standards for primary and basic secondary education. Changes in stereotypes related to understanding of the issues of teaching children with special educational needs are based on new approaches. These approaches do not deal with personality disorders, but with personality orientation, educational competences, creation of appropriate conditions for equal opportunities for education of children and young people. It should be mentioned that variability of education for such individuals, according to their abilities and special needs, allows them to study at all educational institutions, irrespective of forms of ownership and receive psychological-pedagogical, social-rehabilitation, correction-development support timely and actively participate in social life.

In teaching children with special educational needs, a competency-based approach is related to a person-oriented approach. L. Prokhorenko et al., (2020) thinks that a competency-based approach requires transformation in the content of education, transformation of the model “for everyone” into subjective achievements of a pupil which can be measured. The scientist also emphasizes that an activity aspect can be realized only in activity, in the process of performing a particular set of actions by a pupil (Prokhorenko et al., 2020). The scientists highlight that formation of key and subject-related competences in children with special needs occurs in the process of education. The above mentioned formation is realized by means of using a child’s abilities in the course of mastering a particular subject on the basis of the principles of a purposeful interrelation of education and development of such pupils. It was established that interrelations in the formation of different key competences by means of different educational subjects imply the development of motivation for achievements, operationalization, reflectiveness and self-esteem in children which should be able to determine the aim of their activity, focus their volitional efforts to achieve a positive result, use the experience gained to solve educational problems, perform practical actions on reproductive and creative levels, realize methods of their activity and improve it when it is necessary (Prokhorenko et al., 2021).

In a pedagogical dimension, obtaining key competences is necessary for the formation of the

abilities to gain knowledge independently in the course of life, realize them in practical activity, that is an important task of the educational system for teaching children with special educational needs (Sokolova, 2018). It can be summarized that key competences formed at a sufficient level in interrelation with comprehensive skills form a pupil’s competence characteristic enabling children to accept and react properly to individual and social challenges. Competence characteristics reflect the acquired complex of attitudes, values, knowledge and skills necessary for usual life activities and social life of an individual.

### Materials and methods

While developing an empirical strategy of the research, we took into consideration the approbated empirical studies characterizing the following directions: components of an intellectual process of educational activity (Halian et al., 2021; Hulias, 2020); regularities of sensory-motor (Plokhikh et al., 2021) and anticipatory character of an individual’s activity (Popovych et al., 2021c); regularities of the development of educational process (Hulias & Karpenko, 2022; Popovych et al., 2021b; 2021d; Zaverukha et al., 2022); specificity of the creation of intellectual models and typologies (Nosov et al., 2020a; 2020b; Zinchenko et al., 2019; 2020). The outlined directions and the above studies were implemented into the empirical strategy in order to develop a typology of competence characteristics of pupils with intellectual disabilities.

**Participants.** The research participants of the experiment: the total number (n=114) of the children from the first to the fifth grades: pupils with intellectual disabilities (n=57; 50.0%), comprising Group 1 and pupils with normal development (n=57; 50.0%), comprising Group 2.

**Organization of research.** The strategy of the research was developed and implemented in December, 2021 – January, 2022. The research was agreed with administrations and Ethical Committees of the schools whose pupils participated in the experiment. The participants were informed that they could stop their participation in the experiment without explaining if something did not suit them. Voluntary participation and access to information are the key principles for obtaining reliable data.

**Procedures and instruments.** In order to find characteristics of pupils with intellectual disabilities, complex evaluation of the key competences was performed: intellectual-cognitive, emotional-motivational and social competences and the levels of their development were determined by means of the proprietary methodology “Complex evaluation of competences” (Prokhorenko et al., 2020).

The following important element in realization of the research was modelling special educational situations, developed by the group of co-authors supervised by L. Prokhorenko et al. (2020). In the course of realization of the modeled special educational situations, purposeful observation with entering data to the protocols of observations prepared in advance was applied. The modeled situations involved withholding the performance of reflective tasks that required a pupil to realize a new problem, a certain motivation to obtain a result, review of the experience in terms of the ratio of the components of the knowledge gained and skills acquired, their generalization and systematization, organization of the methods for performing actions, development of the basic criteria for regulation of activities when solving an educational problem, the ability to cooperate. The solution to these problems covered those criteria which allowed determining functional specificity of the key and subject-related competences and the formation of the corresponding skills. The research implied three stages.

The first stage is creation of the “situation of success”, accomplishment of the suggested tasks allowed establishing the development of creative-intellectual skills, motivation for achievements and abilities of self-control and self-evaluation. The children were given the tasks with a familiar method for accomplishing them, i. e. the pupils did not have to experience any difficulties. In the course of their activities, the children’s abilities to plan the accomplishment of tasks independently, determine methods for solving problems, control each stage of solving those problems, aspiration to achieve success while accomplishing a task and ask an adult for assistance were analyzed.

The second stage is creation of the situation of “intellectual storm”. The problems solved at this stage allowed realizing a new problem, formulating a new aim for the solution, the ability to actualize, generalize and systematize the knowledge gained and the skills acquired. The children were given the tasks similar to the

previous ones only in external characteristics, but accomplishment of such tasks was oriented towards a new method for actions. It caused an emotional experience of a common failure (“nobody is able to”) in the children, that lead to positive emotions, since there was no worry for one’s own failure against the background of other’s success.

The third stage implied the creation of the situation of “disruption fixation”. The task of this stage was to encourage the children to explain the things they needed to solve a problem. The children had to test the “deficiency of their experience”. The children were asked to analyze the situation of practical difficulties: where and why there was a difficulty in solving the problem. After that, the educational task and the aim of further activity were formulated, a new method for solving the problem was determined. It was necessary to decide on a possibility to accomplish the task independently or the necessity of common assistance. The children’s review of their own actions encouraged them to analyze new details of the task, determine the construction of a new algorithm, apply the experience gained to solve the problem and find a possibility to transfer the knowledge gained and the skills acquired to new conditions of accomplishing a task, change their actions under these conditions etc.

**Statistical analysis.** In order to determine the types, a simplified variant of *k*-means clustering was used. Application of the appropriated proprietary methods and reliable criteria of the research on competence characteristics of pupils with intellectual disabilities allowed measuring integration of the children into educational activities.

## Results and discussion

It was established in the course of the research that children with intellectual disabilities poorly orient themselves in different social and educational situations, they cannot use the information stored in their memory properly, they are often passive and manifest a low rate of interest. The level of motivation is closely related to insufficient development of cognitive interest to educational process. Additionally, motivation is complicated with weak volitional efforts aimed at overcoming difficulties in the course of intellectual activity. A low level of the development of social competence causes not only behavioral problems, but also leads to serious obstacles in academic, social and emotional development of children.

On the basis of analysis of the observation protocols, the formation of the following components was considered to be a common diagnostic feature of the development of competence characteristics in the children participating in the experiment: intellectual-creative abilities, i.e. cognitive processes, search skills, internal motivation, adaptive capabilities, the ability to cooperate and achieve mutual understanding. In the course of the research the formation of subject-related competences and the abilities to use the knowledge gained in the process of learning other subjects and in life activities were analyzed.

Typological features of competence characteristics of a pupil reflect the level of the development of key competences of the research participants with intellectual disabilities. It was an important conceptual decision to perform diagnostics of comprehensive skills and establish their place in the area of relations between knowledge and action in real practice. A key competence was considered to be an ability to learn, flexibility in relationships with peers and adults, adaptation in a social space. A subject-related competence reflects specificity of a particular subject area of educational activity. Comprehensive skills allowed performing educational activity in the context of requirements to the system of education at a certain stage of education. The outlined competences and comprehensive skills are

interrelated, they develop simultaneously and comprise a pupil's competence characteristics.

It was determined in the course of the experiment that by the level of the development of competence characteristics (intellectual-creative abilities, internal motivation, social adaptation, the ability to cooperate and achieve mutual understanding) the children with intellectual disabilities have reliable differences unlike their peers with normal development ( $t=2.1-3.8$ ;  $p \leq 0.05-0.01$ ). Insufficient development of educational motivation, disruption of purposeful brain activity, a low level of motivational control, cognitive decline, inability to regulate one's own feelings and behavior, diffidence, a lack of abilities of self-control and cooperation comprise specific features of the key competences which have a negative impact on these children's educational activities, that cause serious difficulties in the course of gaining theoretical knowledge and acquiring practical skills.

On the basis of the comparison of the obtained indexes by intellectual-creative abilities; interests and internal motivation; adaptive abilities; the ability to cooperate and achieve mutual understanding; mobility in different educational and social conditions, three types of competence characteristics of the pupils were determined: Operational-Reproductive (ORT), Limited-Practical (LPT), Limited-Fixed (LFT) and essential differences of these types were outlined. In Tabl. 1 quantitative and percentage ratios by the outlined types are given.

**Table 1.**

*Quantitative and percentage ratios by the outlined types*

Type	Group 1 (n=57), %	Group 2 n=57), %
Operational-Reproductive (ORT)	n=5; 8.77	n=36; 63.16
Limited-Practical (LPT)	n=32; 56.14	n=19; 33.33
Limited-Fixed (LFT)	n=20; 35.09	n=2; 3.51

**Source:** Personal elaboration, January, 2022.

**Note:** Group 1 – pupils with intellectual disabilities; Group 2 – pupils with normal development.

It was found that ORT competence characteristics include (n=5; 8.77%) the pupils with intellectual disabilities (Group 1) and (n=36; 63.16%) the pupils with normal development (Group 2). We can state that the children with ORT competence characteristics have a sufficient level of cognitive abilities with domination of unstable educational motivation and cognitive interest in educational subjects. These pupils are motivated to obtain a correct result of their work, they can apply methods of interaction while performing activities in familiar situations, they can use the assistance

received while analyzing and making corrections to their work and they are interested in positive evaluation. In a social context they are capable of predicting people's actions on the basis of analyzing real situations of communication (in families, at school, with friends), realizing a new event on the basis of understanding feelings and intentions of communication participants.

It was established that LPT competence characteristics include (n=32; 36.14%) the pupils with intellectual disabilities (Group 1) and

(n=19; 33.33%) the pupils with normal development (Group 2). It was determined that the abilities to act in educational situations are developed insufficiently, educational knowledge and skills often have processual character that affects the level of perception, completeness and adequacy of reflection of the requirements for activity.

It was found that LFT competence characteristics include (n=20; 35.09%) the pupils with intellectual disabilities (Group 1) and (n=2; 3.51%) the pupils with normal development (Group 2). We can state that the children referred to this type are characterized by insufficient development of educational actions that can be traced in manipulations and randomness, domination of game motifs and motifs of avoiding failure (punishment), a low level of functioning of cognitive processes, a low level of social adaptation and negative perception of themselves.

In a pedagogical aspect, ORT is characterized by adequate reproduction of a familiar practical reality in the form of knowledge and finding possibilities, correlation of knowledge under conditions of a familiar activity. Specification of theoretical knowledge in solving a problem within the framework of the basic concepts and the methods learned, the desire to achieve success, the ability to cooperate is a characteristic feature. ORT is characterized by the awareness of a problem situation, understanding of the necessity to choose optimal variants of organization of cognitive actions, however, there is a necessity of continuous comparison of the content of one's own cognitive actions with a familiar sample, that causes their "solution" and inability to use them under conditions of a new activity. Therefore, competence characteristics acquire a limited character. The basis for LFT is insufficient development of cognitive activity, in which, in the course of realization of available knowledge, interrelations between objects under new conditions of activity are not realized, i. e. under changes of the conditions of a familiar type of activity, construction of a new model is not accompanied by a change in the methods and results. In the process of accomplishing educational tasks, there is fixation of knowledge on the totality of rules (methods), stipulating the content and succession of familiar actions. There is a desire to complete the work faster, inability to take advantage of assistance, insufficient development of interaction in the group.

In a psychological aspect, the common manifestation of competence characteristics of ORT is:

a) motivational readiness for educational process, motivation for achievements; b) insufficient intellectual-creative thinking (insufficient development of the operations of generalization and abstraction, at the same time most children have well-formed operations of analysis and synthesis and they can use them while accomplishing simple tasks, they are able to transfer and reflexive analysis of the knowledge gained in familiar situations); c) the system of personal values is formed in the light of the positions of values of micro- and macro-society (family, school); d) value-based positions both towards oneself and towards others, manifestation of empathy in communication, the ability to determine near and far aims in education; e) balancing processes of excitation and inhibition, that enables a pupil to regulate manifestation of social emotions of compassion and sympathy; active communication.

The major manifestations of competence of the pupils with LPT are: a) domination of external motivation (motifs of praises, excellent marks, avoiding failure or punishment, receiving a certain award) and motivation related to the process of education; educational motifs are unstable and depend on emotional coloration, the complexity of activity (they prefer simple, familiar tasks); b) shortages of perception and storage of information, partial perception of requirements, fragmentary analysis of a task; underdevelopment of reflexive thinking that does not allow purposeful internal-intellectual analysis of a task, these shortages are often combined with unstable attention and disruption of the process of switching; c) the ability to find appropriate mode of communication with different interlocutors in familiar situations and the formation of a certain repertoire of role behavior, but inability to recognize the structure of interpersonal situations in dynamics; d) availability of positive emotions and negative experience which are situational and minimal, that ensures emotional psychological comfort and contributes to optimal functioning of a child in society.

LFT involves: a) underdevelopment (limitation) of educational motivation (children are more attracted by emotional motifs (to receive a candy, watch a cartoon), underdevelopment of the system of purposes, needs and motifs which encourage a child to gain knowledge; immature motivational inclinations, insufficiently developed curiosity, short-term interest in

educational activity, insufficient formation of educational needs; b) a lack of practical skills, caused by a lack of realization of theoretical knowledge and possibilities to use them, that, as a rule, leads to a protective reaction and reduces expressive sensibility; b) mixed attitude towards oneself (positive, negative, conflictive); c) spontaneous, uncontrolled character of emotions, a lack of understanding of true reasons of their manifestations; emotional centrality, orientation towards oneself; limitation of social contacts, their superficial and impersonal nature.

We can state that insufficient formation of thinking, speech, imagination, attention, search and adaptive skills, communicative skills in the pupils with disruption of intellectual-cognitive competence. These children show inability to organize themselves in different educational and social conditions. In other words, disorders of pupils' competence characteristics manifest themselves in underdevelopment of educational motivation, in the ability to use interactive methods in education, functioning in micro- and macro-society, that does not contradict to the results obtained by other researchers (Prokhorenko et al., 2020).

Additionally, we established a correlation between intellectual-cognitive, emotional-motivational and social components of competences in the pupils of the groups under study (Group 1 and Group 2) using the method of Pearson's R correlation analysis with  $p \leq 0.01$ . We determined the value of correlations from  $r = 0.52$  to  $r = 0.83$  – in the pupils with normal development (Group 2) and from  $r = 0.11$  to  $r = 0.23$  – in the children with intellectual disabilities (Group 1).

Interpreting the results obtained, we can state that there is a low correlation between all the components of the key competences in the pupils with intellectual disabilities: between intellectual-creative abilities and educational motivation –  $r = 0.21$ , between educational motivation and social adaptation –  $r = 0.17$ . The obtained data evidence that external motifs dominate in educational situations of these pupils (avoiding failures, receiving praises, excellent marks and approval). In the process of accomplishing educational tasks, they manifest inability to observe requirements of a task, analyze a problem situation, perform activity following a given algorithm, make plans and realize them independently, apply interactive methods in the process of accomplishing a task, use knowledge and information literacy. A lack of educational motivation has a negative impact

on adaptive skills, therefore the majority of pupils are unable to act in micro- and macro-society according to the given requirements/rules. A low level of adaptive skills is combined with inability to interact with others, cooperate and manage conflicts. Moreover, most pupils with intellectual disabilities have no ability of intellectual analysis of a task from the beginning to the end, compare the results obtained with the scheme of solving the problem and the aim, that evidences a lack of well-formed cognitive processes.

Unlike the pupils with intellectual disabilities, the pupils with normal development have a high correlation between the components of the key competences: between intellectual-creative abilities and educational motivation –  $r = 0.76$ , between educational motivation and social adaptation –  $r = 0.61$ , between intellectual-creative abilities and social adaptation –  $r = 0.88$ . It means that in educational activity these children are guided by the motifs of achievements, which are related to the content of education more than to its process in most pupils. These children are characterized by awareness of the necessity to plan a task in advance, follow the plan while accomplishing it, the ability to substantiate and correct the mistakes made. In other words, their intellectual-creative abilities, motivation and social adaptation are formed at a sufficient level. We presented quite detailed discussive substantiation of the results obtained since there are no similar studies which could be close to the suggested typology.

## Conclusions

1. The precondition for insufficient formation of competence characteristics of pupils with intellectual disabilities is underdevelopment of the main categories of the key competences, i.e. underdevelopment of motivational intentions for education; inability to subordinate one's own activity to the aim; a low level of the ability to set goals; a lack of educational motivation, domination of near motifs aimed at performing some operations and actions; inability to find appropriateness/inappropriateness of actions, evaluate and make corrections to the stages of activity; inability to solve problems, estimate risks and make decisions; inability to manage emotions constructively, use emotional intelligence and cooperate in a team.
2. A typology of competence characteristics of pupils with intellectual disabilities was

developed and three types were suggested: Operational-Reproductive (ORT), Limited-Practical (LPT) and Limited-Fixed (LFT). Essential differences of these types and their content features were outlined. Pedagogical and psychological aspects of the types under study were found.

3. Using the method of Pearson's R, correlations between the components in the groups under study (Group 1 and Group 2) were determined, with  $p \leq .01$ : from  $r = .52$  to  $r = .83$  – in the pupils with normal development (Group 2) and from  $r = .11$  to  $r = .23$  – in the children with intellectual disabilities (Group 1).
4. We suggested developing a conceptual model of the formation of the key competences of pupils with intellectual disabilities. Creation of a correction-development program for the formation of the key competences will be a practical foundation of the concept. The program will be based on psychological-pedagogical concepts of developing and person-oriented education and will imply the formation of readiness to solve complex practical problems, the development of critical thinking, the formation of organizational skills, the formation of social adaptation, the formation of the ability of effective interaction, the development of abilities to evaluate a problem and make decisions.

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