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### **Development of Social Intelligence of Students on the Basis of Integration of Subject Knowledge**

#### *Abstract*

*Introduction.* The article deals with the problem of formation of social intelligence of high school students through the met educational process with the use of active forms and methods of teaching. The authors substantiate the relevance of the study of students' social intelligence development within the framework of their learning activities as one of the key socio-psychological components of personality formation at school age. *Methodology and Methods.* The stages of the experiment to study the level of students' anxiety (social adaptation) as one of the components of social intelligence in the process of teaching adolescents are described. A total of 200 high school students participated in the study. During the experiment, quantitative research methods were used. The establishing and control stages of the experiment are based on the method of determining the social anxiety of students James G. Phillips. The formative stage of the experiment is based on the complex integrative developmental program, implemented in the natural conditions of the school environment. *Results.* During the study, it was found that the integration of subject knowledge and active teaching methods presented in the complex integrative developmental program, has a positive effect on the reduction of social anxiety among students, which contributes to the development of social intelligence of students. *Scientific novelty.* It has been experimentally proven that the integration of subject knowledge and active teaching methods within a comprehensive program contributes to reducing social anxiety and developing social intelligence in students. *Practical significance.* The distinctive feature of the complex integrative developmental program is the integration of subject knowledge and active forms and methods of teaching. The developed program can be implemented in school practice to develop social intelligence in students.

*Keywords:* social intelligence; social anxiety, subject knowledge; integrative program, experiment.

**Introduction.** In the conditions of dynamic socio-economic and technological changes in modern society, the formation of student's competencies that ensure their successful adaptation in society, is of particular importance. One of the key factors of successful personal adaptation is a high level of formed social intelligence. The development of social intelligence among students is one of the most important objectives of the modern education system. This process contributes to the formation of a competent, adaptive and

psychologically healthy personality capable of successful interaction in society. To achieve this goal, it is necessary to pay attention to the development of the following key components of social intelligence: empathy, self-regulation skills, social adaptation, communication skills and interpersonal interaction skills.

The purpose of the study is to experimentally investigate the impact of subject knowledge integration on the development of social intelligence of high school students. The main research question was as follows: «Does the

integration of subject knowledge have an impact on the development of social intelligence, using the example of anxiety reduction in high school students?».

Social intelligence is a part of human self-actualization and an important indicator of social and individual development of personality (Saraeva et al., 2013). Foreign researchers (Aryani et al., 2024) note that social intelligence is the capacity, capability, or ability to build relationships with others effectively.

In traditional teaching, the emphasis is mainly on the cognitive development of students and mastery of subject knowledge, while social intelligence, being an important component of personality, often remains outside the targeted pedagogical influence. Meanwhile, studies in psychology and pedagogy (Stern & Spoerl, 1938; Davis et al., 2011; Goýlman, 2022) emphasize that a high level of social intelligence is positively correlated with academic performance, professional success, and the quality of social interactions.

In the modern world, the approach that integrates academic learning (learning of individual subjects) with the development of social-emotional skills among students is becoming more popular (Atkins et al., 2023; Pratiwi et al., 2024; Moreno et al., 2024; Liu, 2024). This is realized through the integration of subject knowledge and social-emotional learning, which allows the formation of not only academic but also communicative, empathic and reflective skills.

In traditional teaching, the result is the indicators of mastered knowledge, however, nowadays it is not the sum of acquired knowledge that is important, but the preparation for future challenges. All this characterizes the level of formation of universal learning competencies in the learners. One of the indicators of meta-subject educational results is the formed skill to integrate the acquired knowledge, which is possible with the application of certain teaching strategies, methods and forms of presentation of material with a wide use of meta-subject links.

As a result of the study of research on the integration of subject content, the authors have developed the complex integrative

developmental program (hereinafter - CIDP), aimed at the development of all aspects of social intelligence (empathy, self-regulation, social adaptation, communication skills, interpersonal relations) through the meta-subjectivity of the educational process. The proposed CIDP integrates the subject content of education through selected teaching methods, forms of organization of learning activities of students and developed methodological support. Since the development of social intelligence in schoolchildren is most effectively achieved through their learning activities, the priority areas of learning activities with the greatest potential for self-realization of students were selected (Kırichenko, 2009). These are personal development and education in the course of extracurricular activities, academic work, research work, and project activities.

**Materials and Methods.** The methodological approaches of the study are based on the theory of Salovey & Mayer (1990), which defines the relationship between emotional and social intelligence, resulting in the ability of learners to use emotional information in their thinking and activities.

Method of research. Quantitative research methods were used to test the impact of subject content analysis on the development of social intelligence through a reduction in student anxiety. A pre-test/post-test experiment with a control group was conducted in a natural school environment. At the ascertaining and control stages, J.G. Phillips' method for determining school (social) anxiety was used. The formative stage consisted of the implementation of a comprehensive integrative development program (CIDP), a distinctive feature of which is the targeted integration of subject knowledge and active forms and methods of teaching.

The study uses an author's integrative-motivational-emotional model based on the ideas of the motivational framework «Self-Determination Theory» (Deci & Ryan, 2012) and the theory of learning emotions «Control-Value Theory» (Pekrun, 2006). In the study, interdisciplinary integration and active teaching methods form an autonomous-supportive environment (autonomy, competence, con-

nectedness), strengthen subjective control and the value of learning activities. As a result, students' academic anxiety as an indicator of social adaptation decreases and their social and emotional competencies are strengthened.

A cluster sample was used in the study. Two hundred students from a general education school

and a lyceum participated in the experiment. Parallel classes of 8th and 9th grades were selected in two schools of Pavlodar. Experimental ( $n = 102$ ) and control ( $n = 98$ ) groups were formed, comparable in terms of age, academic performance, and level of socialization. Data on respondents are presented in Table 1.

Table 1. *Representative sample data*

Group	Number of students by groups	School	Grade	Number of students by grades
experimental	102	SCS	8A	26
			9A	25
		School-lyceum	8B	25
			9C	26
control	98	SCS	8B	24
			9B	25
		School-lyceum	8C	24
			9B	25

The control group was taught according to the traditional program, while the experimental group was taught according to the CIDP. Teaching in schools was conducted according to a single State Standard for Secondary Education, which ensured similarity of conditions and representativeness of the sample.

To assess school anxiety, James G. Phillips' Method for identifying the level of school anxiety in students, adapted and translated into Kazakh, was used, which includes 58 statements rated on a 5-point Likert scale (Egorenko et al., 2023). The survey of students in the experimental and control groups was conducted before and after the implementation of the CIDP. Before taking the survey, respondents were asked to read and sign an informed consent form with the right to choose or refuse to participate in the experiment.

The research data was collected online. The indicators were represented in the categories «high/medium/low» anxiety levels. Standardized anxiety diagnostics were performed in the EG and CG. The results are presented in a summary table and a diagram of average values. After the implementation of the CIDP in the EG and a comparable period of training in the CG, a repeat diagnosis was performed using Phillips and a comparison of anxiety level distributions was made.

Descriptive statistics were used, with responses presented as a percentage distribution. This made it possible to compare the results between schools and groups of students to identify differences in the development of social anxiety, as well as to identify key patterns and frequencies in student responses.

**Results.** The aim of the empirical study is the impact of integrating subject knowledge and pedagogical methods on the level of development of social intelligence of learners.

The ascertaining stage consisted of diagnosing the initial level of learner's anxiety according to the James G. Phillips method (Egorenko et al., 2023). Standardized tests were used for preliminary testing of students. The diagnostic results are presented in Figure 1 and Table 2.

– in both groups a significant number of students (on average about 50%) have an average level of anxiety, which requires preventive work;

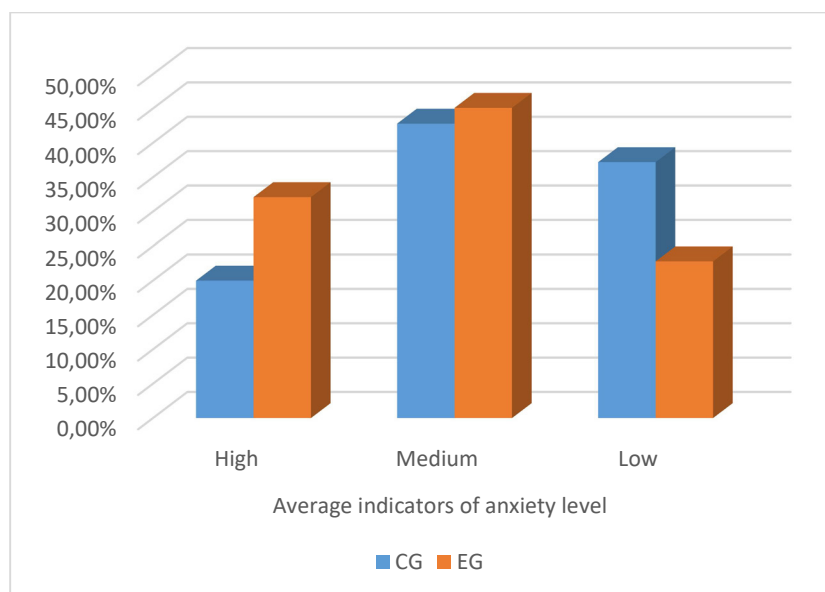
– a high level of anxiety was found in an average of 30% of EG students;

– the main factors of anxiety are related to fear of evaluation, lack of support from teachers, difficulties in relationships with peers.

The results of the ascertaining stage of the experiment revealed the aspects requiring

attention for the development of emotional intelligence fear of the situation of knowledge testing, non-compliance with the expectations of others and self-expression. This made it possible to develop the CIDP aimed at the development of emotional intelligence of students. CIDP was

developed on the basis of the state educational standard of secondary education, taking into account the achievement of learning objectives in subjects and approved by the methodological council of the secondary education organization of Pavlodar city.



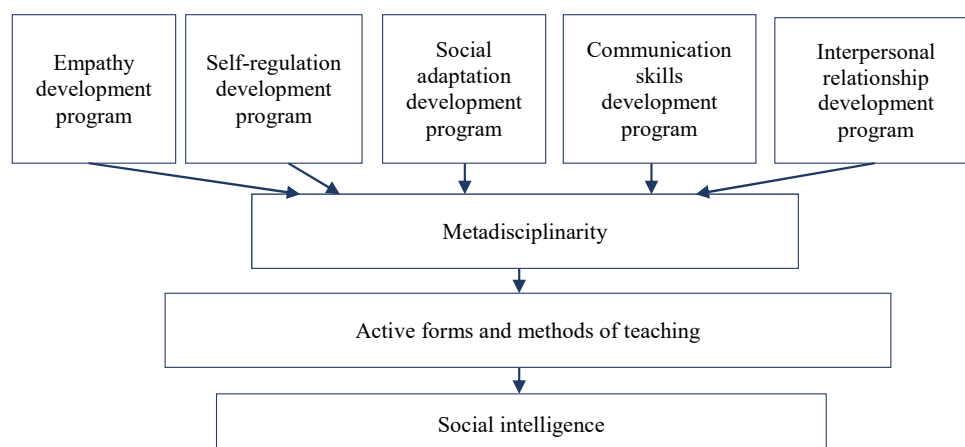
**Figure 1: Comparative indicators of anxiety level (social adaptation) according to the mean**

**Table 2. School anxiety level (social adaptation)**

Indicators	Level	CG	EG
Average indicators of anxiety level	High	20%	32,1%
	Medium	42,8%	45,1%
	Low	37,2%	22,8%

The formative stage of the experiment was based on the application of the CIDP aimed at the development of components of social intelligence (empathy, self-regulation,

social adaptation, communication skills and interpersonal skills) through the meta-educational process and with the use of active forms and methods of teaching (Figure 2).



**Figure 2: Complex integrative developmental program**

In CIDP, the integration of subject knowledge in the educational process is a purposeful interrelation between structural components of different subjects and is based on teaching methods such as:

- *Interdisciplinary research projects* that integrate theoretical frameworks and methodological approaches to different subjects to solve complex problems or study multifaceted phenomena. Projects promote collaborative learning and encourage students to consider problems from different perspectives;

- *Essay writing* is a method that synthesizes linguistic competence with scientific literacy to improve both the understanding of subject content and the ability to articulate and communicate effectively with audiences;

- *Artistic representation of objects and phenomena*, where the integration of, for example, history with the visual arts allows students to gain a deeper understanding of the historical era, visualizing of key events and figure. This approach develops student's historical knowledge and creativity;

- *Game forms of learning* (quests, puzzles, role-playing games related to the educational material, etc.) with elements of rewards for successful completion of tasks;

- *Group trainings and individual conversations* aimed at developing empathy, communication and teamwork skills, as well as relieving high levels of anxiety.

The contents of the CIDP are displayed in Table 3.

Table 3. *Social adaptation program*

Topic and activity	Goal	Expected result
«Know thyself»: getting to know each other through play	Relieving tension, building confidence	Improvement of social interaction
«Mind Games»: math problems in teams	Development of cognitive confidence	Reducing the fear of making mistakes
«Emotions in learning»: training on expressing emotions	Awareness of emotions, reduction of emotional tension	Building confidence in open expression
Interdisciplinary quest	Combining learning knowledge in a game format	Increasing confidence through success in the game
«Are we good listeners?»: group work	Development of active listening skills	Improving understanding
Practical work: application of knowledge in the lesson	Linking theory with practice	Increasing interest in subjects
«My superpower»: summarizing the results	Reflection and discussion of achievements	Building a positive self-perception
Closing meeting: a common game	Strengthening cooperation skills	Creating a positive interaction experience

Are examples of correction asks:

«Integrated quest» (25 minutes)

The class is divided into 4 groups. Each group performs a task related to one of the academic subjects:

Example samples of tasks:

1) *Geography*: develop a tourist itinerary of an excursion to one of the regions of Kazakhstan, indicating natural sights, climatic conditions and necessary safety measures;

2) *Algebra*: solve a logical problem using equations - how many different combinations of prizes, treats and gifts can be bought for a school holiday if a limited amount of money is allocated?

3) *Physics*: devise and describe a simple experiment that demonstrates how friction works in everyday life (e.g., in sports or transportation);

4) *History*: make a historical quest – an interactive game for classmates based on the



events of one of the key periods (e.g. the Great Patriotic War (World War II), the Golden Horde or the reign of Abylai Khan).

Upon completion, each team presents the results, and the rest of the class participates in the discussion, asking questions and suggesting other options for developing the assignment.

Questions for discussion:

- Which assignments sparked the most interest and why?
- Were there times when you felt anxious?
- Which knowledge or skills will be useful for you in your life?

The class creates conditions for reducing anxiety through engagement, play and an interdisciplinary approach.

The tasks demonstrate the practical value of knowledge and help students to feel confident through cooperation and success. These assignments promote a holistic view of the world, critical thinking, communication

and research skills. At the same time, playing together makes the learning process emotionally supportive and safe.

Increasing self-confidence through successful completion of learning tasks and participation in-group activities helps students to overcome their fears and strengthen their positive attitude towards learning. The expected long-term effects include improved learning outcomes, increased school engagement and a decrease in the number of students with high levels of anxiety.

A repeated assessment of school adaptation level (specifically anxiety), using James G. Phillips methodology after the implementation of the comprehensive program, demonstrated that integration of specialized methods to reduce anxiety positively affects students' behaviour and emotional well-being. This, in turn, helps create favourable conditions for the development of social intelligence (Figure 3, Table 4).

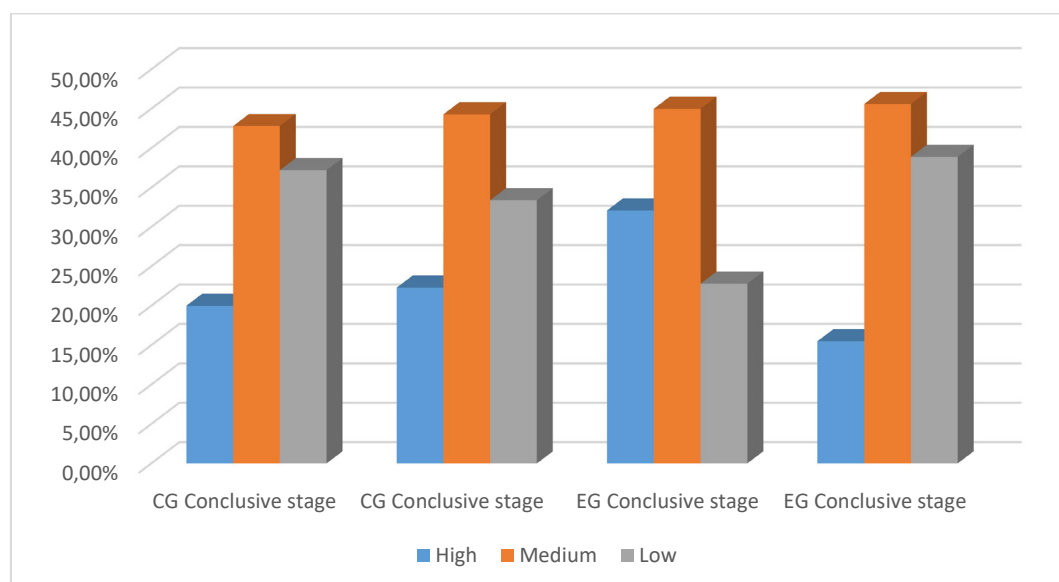


Figure 3: Comparative measures of anxiety (social adjustment) by mean post-CIDP scores

Table 4. Indicators of changes in the level of school anxiety (social adaptation) after undergoing CIDP

Data	Level	CG before CIDP	CG after CIDP	EG before CIDP	EG before CIDP
Average anxiety level indicators	High	20%	22,3%	32,1%	15,5%
	Medium	42,8%	44,3%	45%	45,6%
	Low	37,2%	33,4%	22,8%	38,9%

Comparative analysis of the results of repeated diagnostics of respondents showed that the percentage of students with high level of anxiety in EG decreased by 16.6% (from 32.1% to 15.5%), while in CG - increased by 2% (from 20% to 22.3%). At the same time, the percentage of schoolchildren with low level of anxiety increased by 16.1% (from 22.8% to 38.9%) in EG respondents, while in KG the percentage of schoolchildren with low level of anxiety decreased by 3.8% (from 37.2% to 33.4%). Thus, EG students began to participate more actively in-group work and demonstrate self-confidence.

**Discussion.** In developing the study design, the authors were guided by Kreijkes & Grotorex's (2024) recommendations for describing the characteristics of control groups and their learning conditions. Since parallel 8th and 9th grades with equal starting conditions were selected, it can be said that the sample is representative in assessing potential causes of differences between the experimental and control groups.

The developed and tested CIDP, based on the synthesis of subject knowledge and active learning methods, made it possible to expand the implementation of meta-competence in educational practice through the emphasis not only on cognitive, but also on social-emotional learning outcomes. This is in line with international approaches to integrating subject content with SEL (Pratiwi et al., 2024; Moreno et al., 2024).

The obtained results of the experiment confirm the findings of scientists (Cardozo et al., 2020; Silke et al., 2024) about the positive impact of active learning methods on improving the social adaptation of students. At the same time, scientists recommend adapting these methods in such a way as to minimize students' anxiety in the classroom, creating a supportive and conducive educational environment.

In addition, the results of the study correlate with the findings of scientists (Nicole et al., 2025; Jack et al., 2020) about the importance of directed and organized learning in the development of students' emotional intelligence and reducing their anxiety levels. The study

makes an empirical contribution by confirming that the systemic integration of subject content and active learning methods contributes to the reduction of social anxiety in schoolchildren (by 16.6% in the experimental group) (Cardozo et al., 2020; Salter et al., 2024). According to the results of the study, we adhere to the position of scientists (Pulgar et al., 2022) about the role of cooperation among students, social interactions and support among peers in improving the overall psycho-emotional state of learners.

The results of the experiment confirm the results of studies (de Lijster et al., 2018; Salter et al., 2024), where anxiety is considered as an obstacle to social adaptation in school. Considering the results of this study, measures to improve social interaction along with reducing anxiety levels through group tasks with role assignment were included in the design of the CIDP.

Meanwhile, there are obvious limitations of the study, related, as noted by scientists (Kreijkes & Grotorex, 2024), to the question of the benefits of integrating subject knowledge on the academic performance of learners in each individual subject left unexplored. For the purposes of this study, we can only argue that integrating subject knowledge improves the development of learner's emotional intelligence. However, the appropriateness of this approach on a sustained basis needs further investigation in terms of improving students' social experiences and academic performance.

It should also be noted that the data from the current study were not subjected to in-depth factor analysis, which limits the findings of the study. Subsequent studies may include factor analysis, for example, examining the integration of subject knowledge (Abu-Hijleh et al., 2025) on the scale of empathy and or cooperation of learners or comparing different groups of learners, etc. (Gholamian et al., 2019).

It should also be noted that the long-term impact of CIDP on pupils' adaptation has not yet been studied. As Pulgar et al. (2022) note, a sustained effect in the development of emotional intelligence requires long-term work in a stable educational environment that includes elements of mutual support and reflection.

**Conclusion.** The results of the study indicate that high levels of school anxiety and insufficient social adaptation are observed in more than one third of respondents. The main factors named are fear of the situation of testing knowledge, not meeting the expectations of others and self-expression, which requires prevention and intervention at the school level. The CIDP aimed at reducing school anxiety using active learning methods and subject knowledge showed positive changes in the level of student's confidence and their ability to cope with emotional difficulties in learning activities. The use of cross-curricular assignments and active forms and methods of teaching contributed not only to the development of cognitive and social skills, but also to a significant reduction in students' anxiety. In the course of the lessons, students learned to reduce their anxiety level through successful completion of tasks, which in turn increased their self-confidence. Systematic use of these methods

in the future can significantly increase the psychological adaptation of students, contributing to their more harmonious development in both academic and social spheres.

The teacher's use of active forms and methods of teaching forms the student's ability to integrate subject knowledge to solve problems. This learning environment helps students to respect the opinions of other children, to consider situations from different perspectives, and to learn to interact constructively together. As a result, students become more open, flexible and confident in team projects. In addition, the educational process based on the integration of subject content with active forms and methods of teaching contributes to the development of student's self-reflection skills. This, in turn, has a positive impact on the development of children's confident interaction with the surrounding world and rapid adaptation to changing conditions of social reality.

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