ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

PSYCHOLOGICAL SCIENCE AND EDUCATION

ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

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PSYCHOLOGICAL SCIENCE AND EDUCATION

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Содержание

Dear Readers!

Here is the 3rd issue of the journal Psychological Science and Education (№ 3—2024 g.). There are two traditional sections, "Developmental Psychology" and "Educational Psychology".

The section "Developmental Psychology" studies the connection between the development of memory and attention of preschoolers and their gaming activities (board and digital games), using the game "Dobble" as an example. Another topic raised in the issue is the correlation between attitudes towards cheating, social beliefs and perceived attitudes of others. The results show a correlation of active and passive dishonesty with perceived norms and one's own values.

In this section you can also find the study of the big five personality traits defining language anxiety and creative personality, you will also find the results of research on the specificity of higher mental functions in children with a leading left hand. The final article of this section analyzes the influence of role-playing games and project activities on the development of social competence in older preschool children.

The section"Educational Psychology" discusses the methodology of formation of universal learning actions for getting meta-subject results of general education. It considers the key ideas of cultural-historical and system-activity approaches, which are fundamental in achieving the main results of school education, and raises the problem of developing new teaching methods based on the use of reflexive technologies.

The section closes with a review of contemporary critical thinking research and a study of critical thinking and literacy skills in elementary school.

We hope that the readers will find a lot of interesting materials in the new issue of the journal Psychological Science and Education.

The Editors

DEVELOPMENTAL PSYCHOLOGY (AGE PSYCHOLOGY) |
ПСИХОЛОГИЯ РАЗВИТИЯ (ВОЗРАСТНАЯ ПСИХОЛОГИЯ)

Association between Memory and Attention Performance among Preschoolers Playing Traditional and Digital Games (on the Example of "Dobble")

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The article presents the results of the project "The Impact of Digital Activity on the Development of Cognitive Functions in Preschool Age". The study was conducted from February to May 2023 at the Center for Interdisciplinary Research of Contemporary Childhood at MSUPE, involving 76 children from preparatory groups of kindergartens in Moscow. The following methods were used: the "Learning 10 Words" Method (A.R. Luria), D. Weksler's Subtest (the "Coding Method"), 3. "Test of Intertwined Lines" (A. Rey's Test Modification), and the "Mark the Signs" Method (Pieron-Ruser Test). According to the obtained data, the digital version of the game "Dobble" has the greatest effect on the development of the studied parameters of memory and attention in preschool children. The obtained empirical data are consistent with the results of similar studies and are of interest to psychologists, educators, and parents in planning and conducting educational and play activities.

Keywords: board games; digital games; preschool age; cognitive functions; memory; attention; game applications; Dobble.

Связь показателей памяти и внимания с использованием настольных и цифровых игр дошкольниками (на примере игры «Dobble»)

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В статье представлены результаты проекта «Влияние цифровой активности на развитие когнитивных функций в дошкольном возрасте». Исследование проводилось с февраля по май 2023 года на базе Центра междисциплинарных исследований современного детства МГППУ при участии 76 детей из подготовительных групп ДОУ г. Москвы. Были использованы следующие методики: Методика «Заучивание 10 слов» (А.Р. Лурия), Методика «Шифровка» (Субтест Векслера), Методика «Тест переплетенных линий» (Модификация теста А. Рея), Методика «Проставь знаки» (тест Пьерона-Рузера). Согласно полученным данным, наибольший эффект на развитие исследуемых параметров памяти и внимания детей дошкольного возраста оказывает цифровая версия игры «Доббль». Полученные эмпирические данные согласуются с результатами аналогичных исследований и представляют интерес для психологов, педагогов и родителей при планировании и проведении обучающих и игровых занятий.

Ключевые слова: настольные игры; цифровые игры; дошкольный возраст; память; внимание; игровые приложения; Dobble.

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Introduction

In Russian psychological and pedagogical science play is traditionally considered the leading activity of preschool age, in which central age-related new formations are developed, including voluntary behavior, subordination of motives, imagination, visual-figurative thinking, internal plan of actions, and mediation [3; 7; 17]. The exceptional importance of play for child development is primarily due to the peculiarities of play as a special type of activity. According to S.L. Rubinstein, play is "a meaningful activity, i.e., a set of meaningful actions united by a single motive" [14, p. 649]. According to A.N. Leontiev, the play motive, unlike all other types of activity, lies not in the result of the action but in the very process of play [10]. It is the presence of the play motive that allows us to distinguish a set of play actions performed by the child from the actual play activity, in which various mental functions and processes, including cognitive ones, develop. Today, researchers from different countries are increasingly attracted to the problem of developing cognitive processes in preschool children under the conditions of the rapid penetration of digital technologies into the child's play.

In recent years there has been a decrease in the age at which children around the world become acquainted with gadgets and a steady increase in the time children spend interacting with them [15]. According to a report by the Joint Research Centre of the European Commission for 2017, most children get acquainted with digital technologies in the first months of life and become active users of gadgets by the age of two [20]. While abroad, digital devices specifically designed for children (toys connected to the Internet, books, and games with augmented reality) are particularly popular, preschoolers in Russia mainly use their parents' gadgets—cellphones, tablets, and computers, which largely determines the digital content available to them [6]. Most often Russian preschoolers use educational programs and digital games.

The concept of "digital game" (hereinafter referred to as DG) encompasses two phenomena for which the terms "digital play" and "digital game" are used in English-language scientific discourse. The term "digital play" refers to the actual play activity as a system of rules, roles, plots, and play actions. "Digital game" primarily refers to software and implies a certain material and/or virtual content: the goal of the game, predefined settings, game levels, a system of characters, etc. [28]. In this study, the term DG is considered in the meaning of "digital game," the closest synonym of which is "video game."

At present, psychological and pedagogical science has already accumulated a significant amount of data on the influence of DG on the development of preschoolers [8; 13; 18; 19; 21; 22; 23; 26]. Several studies have shown that when screen time norms are observed, DGs contribute to the development of a child's working memory [18; 22], with reaction speed games having a particularly strong effect [13]. In addition to working memory, voluntary attention is also developed [8].

It should be noted that alongside studies on the impact of digital games on preschool development, there is a growing body of work focusing on board games (hereinafter referred to as BG). This trend is partly due to the increasing popularity of BGs among preschoolers [24; 25; 27; 29]. For example, according to a survey conducted in 2023 by the Center for Interdisciplinary Research

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on Contemporary Childhood at MSUPE among parents of preschoolers, 91.5% of children aged 3—7 play board games and 70.1% play digital games [16]. Studies on board games often explore their impact on the development of communication skills, the acquisition of counting skills and mathematical operations, the formation of regulatory functions, and the expansion of knowledge about the surrounding world [24; 27; 29]. At the same time, the problem of the influence of board games on the development of cognitive processes remains insufficiently studied.

In 2023—2024, with the support of the Russian Science Foundation a project is implemented at the Center for Interdisciplinary Research on Contemporary Childhood at MSUPE, which aims to identify differences in memory and attention indicators in older preschool children who play board games and their digital analogs (using the popular game "Dobble" as an example).

Methodological Basis and Research Design

Unlike several contemporary studies in this field, whose authors rely on the currently popular model of executive functions, this study was conducted in the framework of the Cultural-Historical Theory and Activity Approach.

It is necessary to clarify the interpretation and content of the key concepts used in this study. The concept of attention is understood as "the process of selecting the necessary information, ensuring selective programs, actions, and maintaining constant control over their progress" [11 p. 168]. Attention is determined by the structure of human activity, reflects its dynamics, and serves as its control mechanism. S.L. Rubinstein identifies six main properties of attention [14], which include: concentration, distribution, stability, switch ability, flexibility, and volume.

In turn, memory, according to A.R. Luria, is interpreted as "the recording, reten-tion, and reproduction of traces of past experience, giving a person the ability to accumulate information and deal with traces of past experience after the phenomena that caused them have disappeared" [11, p. 192]. The process of memory formation in a child is associated with mastering the mechanism of mediation [3; 4]. Traditionally, various types of memory are distinguished in psychological and pedagogical science [2; 5; 9]. This study focuses on auditory, visual, short-term, and long-term memory.

The design of the study presented in this article included the experiment itself, as well as pre- and post-diagnostics, within which the following methods were applied:

1. "Learning 10 Words" method (A.R. Luria) was used to assess such parameters of auditory short-term and long-term memory as memorization, retention, and reproduction;

2. D. Weksler's Subtest (the "Coding" method) was used to study the volume of visual memory;

3. "Test of Intertwined Lines" (A. Rey's Test Modification) was used to study the degree of concentration of voluntary attention.

4. The "Mark the Signs" method (Pieron-Ruser Test) was used to assess such parameters of voluntary attention as stability, distribution, switch ability, and pace of activity.

The data from the pre- and post-diagnostics were tested for normal distribution using the Kolmogorov-Smirnov criterion. The distribution indicators of all variables differed from normal, so non-parametric methods of statistical analysis were used. Specifically, the statistical non-parametric Wilcoxon t-test was applied to compare effects within each group before and after the experimental impact (intra-group comparisons), the Mann-Whitney U test for inter-group comparisons, and Spearman's correlation coefficient. The calculations were carried out using the IBM SPSS Statistics 23 package.

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The experimental study was conducted from February to May 2023 at two kindergartens in the city of Moscow (Southern Administrative District and Central Administrative District). The sample included 76 children from preparatory groups (M=6.60 years, SD=0.41, 51.32% girls).

According to the research design, the children were divided into three groups: Experimental Group 1 (EG 1), where the children played the board game version of "Dobble," Experimental Group 2 (EG 2), where the children played the digital game "Dobble" — "Double Match: one common image" on tablets, and the Control Group (CG). 19 children were in EG 1 (11 boys and 8 girls), 26 children in EG 2 (10 boys and 16 girls), and 31 children in CG (16 boys and 15 girls). The experiment used the board game "Dobble" and its digital equivalent. The game aims to develop the ability to concentrate, distribute, and switch attention, as well as cognitive flexibility, and reaction speed. The digital equivalent chosen was the app "Double Match: one common image." This app's card appearance closely resembles the board game's cards, and it allows for joint play with a familiar partner, which is crucial for this study.

According to the research design, over 8 weeks, children from the experimental groups played the board (EG 1) or digital (EG 2) version of "Dobble" twice a week. Thus, each child participated in about 16 game sessions during the experimental study.

Participants in EG 1 played the board game for about 10-15 minutes in pairs or in groups of three. If the children were highly engaged, the game could continue longer. At the beginning of the experiment, a few children from EG 1 (N=2) refused to play the board game, saying they were more interested in playing with construction sets. During the experiment, around the 2nd-3rd week, more children (N=4) refused to play the board game, saying they were "bored with playing 'Dobble'." By the end of the experiment, only 6—8 children showed interest in the board game, while the rest participated only after persuasion, though they usually became involved during the game. In the 6th-8th weeks of the experiment, the children began to invent their own game rules: they were allowed to play with the cards by their own rules after the experiment time had passed. At the beginning of the experiment, the children reacted strongly to winning or losing; by the end of the project, the intensity of their emotional responses decreased.

In EG 2, the duration of the game session was fixed and was approximately 10-15 minutes per day, since, according to Sanitary Regulations and Norms 2.4.1.2660-10, the continuous duration of computer work in the form of educational games for children aged 6-7 should not exceed 15 minutes per day. The game was played in pairs under adult supervision. In EG 2, each child used their tablet with the installed digital game (DG). The tablets were connected to each other over the network for joint play. Around the 3rd week of the experimental study, children from EG 2 (N=2) began showing signs of fatigue and reluctance to play the DG. Additionally, some children (N=3) tried to take on the role of game organizers, inventing their own rules for turn-taking. After this, a constant change of gaming partners was introduced, and a competitive motive appeared in the game, which helped to restore interest in the gaming process. Throughout the study, a group of children (N=6) stood out, showing a desire to support their gaming partner (children helped their partner find matching images on their cards).

Results of the Experimental Study

At the stage of the initial diagnosis using the "10 Words" method, there were no differences between the three groups: the average reproduction scores did not show statistically significant differences (Z = –0.24; p ≤ 0.81 for EG 1 and EG

2; $Z = -0.19$; $p \leq 0.85$ for EG 1 and CG; $Z = -0.34$; $p \leq 0.74$ for EG 2 and CG), indicating equal cognitive performance among preschoolers in each group at the initial testing stage. Significant results were found in all the three groups between the data from the initial and final diagnostics, i.e., the average number of words reproduced increased in each group (Table 1).

Differences between the memory capacity indicators before and after the experiment are observed in all three groups ($Z = -5.59$; $p \leq 0.000$). There is a clear trend of increasing the number of reproduced words by the 4th trial and successful delayed retention of the stimulus material as per the results of the initial and final diagnostics. Overall, these data can be attributed to the general cognitive development of the children due to their age.

Significant differences in the average number of reproduced words were found among the three groups during the final testing phase (Fig. 1). The children in EG2 demonstrated the best memory retention. The average number of reproduced words was nearly 9 (8.75), significantly higher than the results of children in EG1 ($Z = -2.96$; $p \leq 0.003$) and CG ($Z = -3.68$; $p \leq 0.000$) (Fig. 1).

The comparative analysis results show an effect on the development of short-term and long-term auditory memory in EG2 children after the experimental study.

Positive effects observed in the average indicators of visual memory capacity using the Weksler's Subtest before and after the experiment in all three groups indicate positive dynamics in overall memory development. For example, in EG2, where children demonstrated an average level of visual memory development before the experiment (9.43), they achieved a significantly higher level (11.79) by the end of the experiment. A similar effect, though less pronounced, was observed in CG (9.69 before and 10.59 after). Children in EG1 also improved their results, reaching the threshold of a high level of visual memory development (9.63) (Fig. 2). Significant differences between the final testing indicators in the experimental groups (NI and CI) were identified ($Z = -2.17$, $p \leq 0.03$). Also, significant differences were found between the final testing indicators in EG2 and CG ($Z = -1.9$; $p \leq 0.06$). In both groups, the average indicators before and after the experiment correlated with each other (in EG2 ($r = 0.64$; $p \leq 0.03$) and CG ($r = 0.51$; $p \leq 0.01$)). However, differences between the indicators of respondents from EG1 and CG could not be identified ($Z = -0.73$; $p \leq 0.5$).

The obtained effect indicates that children who played digital games became

Table 1

Comparison of average scores for each test at the stages of initial and final testing

	EG1		EG2		CG	
	Before	**After**	**Before**	**After**	**Before**	**After**
1st trial	4,31	6,16	3,77	6,39	4,03	5,9
2nd trial	5,52	7,16	6,31	8,26	6,19	7,17
3rd trial	6,57	8,32	7,32	9,48	7,13	8,07
4th trial	7,63	8,84	8,16	9,7	8,26	8,14
5th trial	8,26	9,21	8	**9,82**	9	8,1
After 1 hour	7,68	7,53	6,92	**8,9**	7,23	7,44
M (5 trials)	6,458	7,938	6,712	8,73	6,922	7,476
M (5 trials + delayed reproduction)	6,67	7,86	6,62	8,75	6,68	7,47

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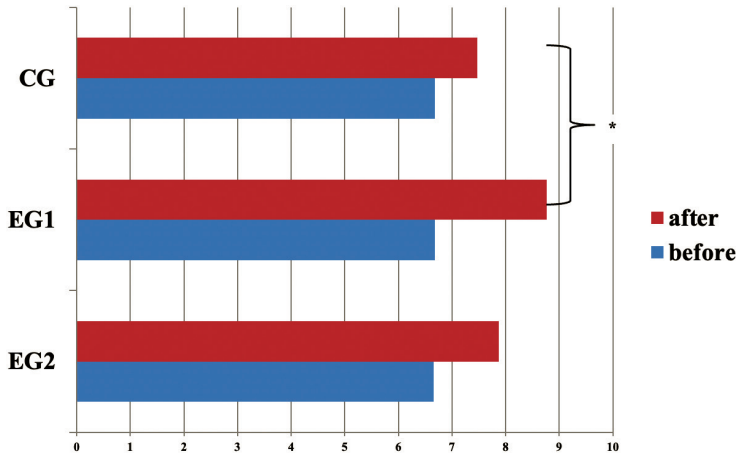
Fig. 1. Comparison of initial and final testing indicators across all groups

more effective at memorizing and repro-
ducing visual stimuli compared to children
who played board games and those in the
control group.

The results of the "Intertwined Lines
Test" (Modification of A. Rey's Test) were
analyzed based on the parameters of time
and the number of errors during task per-
formance.

In the experimental group 1 (EG1), the
average time to complete the tasks de-
creased from 1.94 (pre-test) to 1.7 (post-
test) with a significance level of p ≤ 0.05. In
the experimental group 2 (EG2), the time
spent on the game decreased from 2.58
(pre-test) to 1.91 (post-test), although these
values slightly missed the acceptable level
of statistical significance at p ≤ 0.1. In the
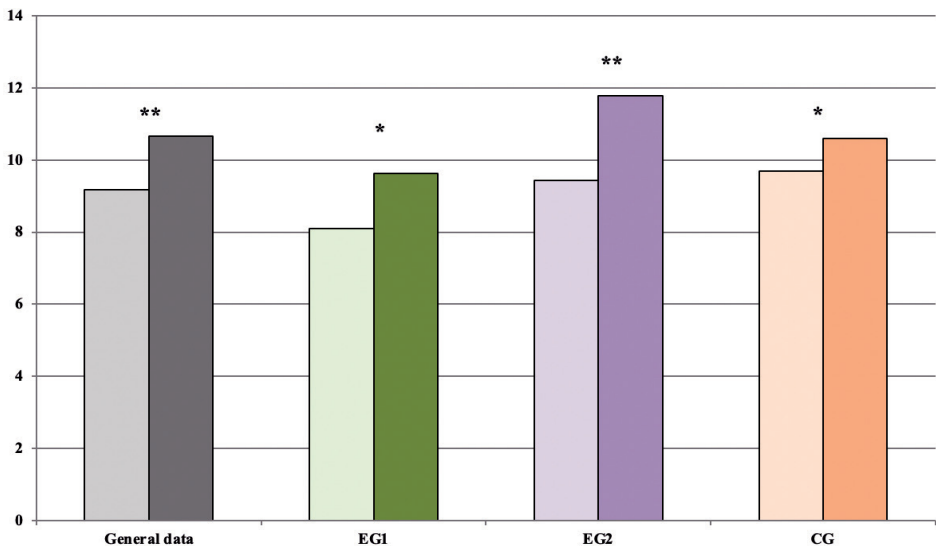
Fig. 2. Comparison of initial and final testing indicators across all groups in visual memory

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control group (CG), the indicator dropped from 2.13 (pre-test) to 1.69 (post-test) with a significance level of $p \leq 0.01$ (Fig. 7). Overall, across all three groups, the trend of decreasing time was observed from 2.23 to 1.76 ($p \leq 0.000$), indicating that all children completed the tasks faster by the post-test (Fig. 3). This trend could be explained by the familiarity with the methodology.

The indicator of the number of errors in all three groups also showed a decreasing trend (Fig. 4). In EG1, the number of errors during task performance decreased from 4.53 (pre-test) to 3.42 (post-test), and in EG2, from 4 (pre-test) to 3.05 (post-test) (significance levels $p \leq 0.05$). The control group improved its results from 4.1 (pre-test) to 3.5 (post-test); however, this indicator did not reach the necessary level of statistical significance ($p \leq 0.24$). Overall, the number of errors across all three groups decreased from 4.15 to 3.35 with a significance level of $p \leq 0.000$.

Additionally, a correlation analysis was conducted between the time indicators and the number of errors. In EG1, a significant positive correlation was found between the time indicators and the number of errors made in the post-test — 0.52 ($p \leq 0.01$). Thus, the faster the children in this group completed the task, the fewer errors they made. A positive correlation
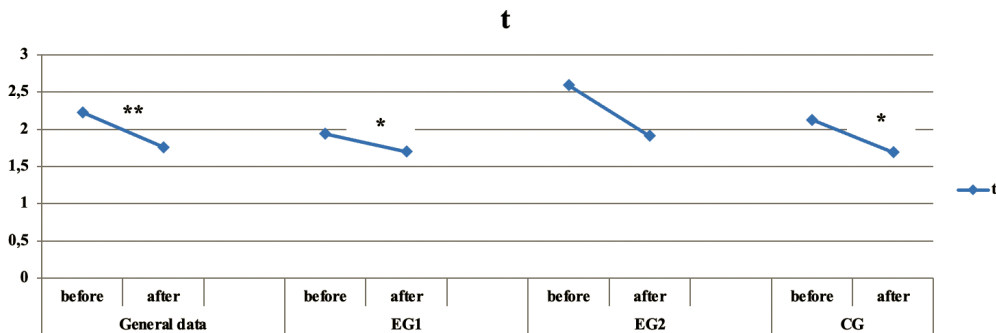
Fig. 3. Comparison of time indicators across all groups (*$p \leq 0.05$; $p \leq 0.000$)
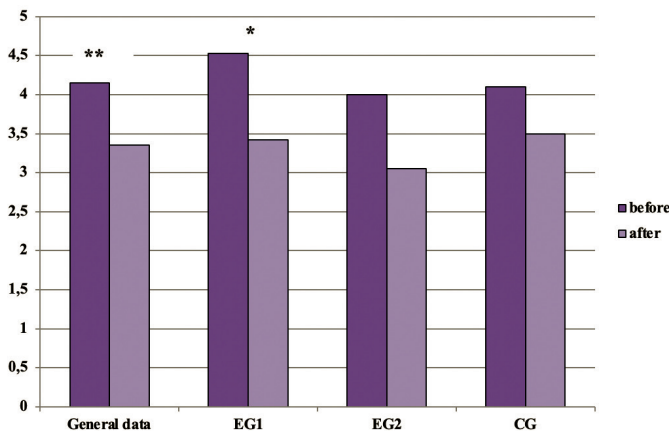
Fig. 4. Comparison of the number of errors across all groups (*$p \leq 0.05$; $p \leq 0.000$)

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was also observed between the time indicators in both instances — 0.47 (p ≤ 0.01). No significant correlations were found in EG2 or CG, except for a positive correlation between the time and the number of errors in the pre-test in CG — 0.47 (p ≤ 0.01). Overall, there were no statistical differences in the time indicators and the number of errors among the three groups, which could be explained by individual differences among the children and the presence of additional factors. The time indicators and the number of errors in all three groups significantly decreased in the post-test compared to the pre-test, indicating that all children completed the tasks more efficiently, spending less time. These findings suggest a trend towards increased attention stability.

The results obtained from the "Mark the Signs" methodology (Pierón-Ruser's test) were analyzed across all groups based on the following indicators (Fig. 5):

1. "time" — total time taken to complete the task. At the stage of the initial diagnosis, the groups did not differ in terms of time. After the experiment, significant differences were found between the experimental groups: children in EG2 completed the tasks significantly faster than children in EG1 (Z = -3.89; p ≤ 0.000). Children in CG also completed the task faster than preschoolers in EG1 (Z = -2.61; p ≤ 0.009). However, preschoolers in EG2 completed the task faster compared to the children in CG, although the coefficients did not reach an acceptable level of statistical significance (Z = –1.8; p ≤ 0.07).

2. "false" — number of errors (total and at each stage). No differences were found between the groups in this indicator (except for subjects in CG and EG2 at the second testing stage); however, overall, each group improved their results in the post-test compared to the pre-test.

3. "step" — number of steps. The number of steps, i.e., the number of figures, filled in 30 seconds, was used to evaluate the children's performance. Statistical differences were noted between the experimental groups at the pre-test stage: children in EG1 made significantly more steps compared to children in EG2 (Z = –2.1; p ≤ 0.04). At the post-test stage, the differences between the experimental groups increased to a significance level of p ≤ 0.000. The group of children who played the digital game made the fewest steps when completing the tasks.

4. "coeff" — task performance coefficient (calculated as the number of steps divided by the total number of figures). This indicator was calculated to identify the individual performance of each child. Differences at the level of p ≤ 0.04 were found between the experimental groups at the pre-test stage.

Thus, children in EG2 performed the task more efficiently than children in EG1: they filled a greater number of figures for each 30-second step. Similar differences were found between CG and EG1 in favor of the control group children, whose performance was higher (Z = –2.5; p ≤ 0.01). Post-test results also showed differences between the experimental groups (at the level of p ≤ 0.000). Additionally, differences were found between CG and EG1 at the significance level of p ≤ 0.01. These data suggest that preschoolers in EG2 performed the tasks more efficiently than children in EG1, and children in CG also showed greater productivity compared to participants in EG1.

Thus, children from EG2 showed better results across all analyzed parameters. They completed the task more accurately and efficiently, spent less time, and made fewer moves. The group quickly memorized the symbols for each figure, retained the instructions, and rarely referred back to them during the process. The observed effects suggest a high degree of sustained voluntary attention and a high activity rate among children in this group.

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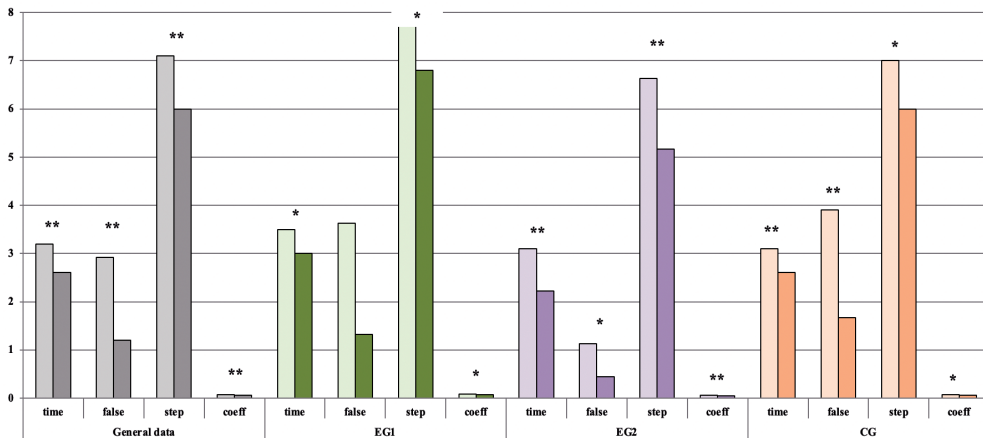
Fig. 5. Comparison of groups across all indicators (*p ≤ 0.05; p ≤ 0.000)

Discussion and Conclusions

The presented study aimed to identify differences in memory and attention indicators among older preschool children playing board games and their digital counterparts (using the popular game "Dobble" as an example). The analysis results showed significant positive effects in the group of children who played the digital version of the game "Double Match: one common image" in developing short-term and long-term auditory memory, visual memory, and sustained voluntary attention, compared to the control group and the group of children who played the board game "Dobble." Thus, the digital version of the game "Dobble" had a more significant developmental impact on the studied parameters of memory and attention in preschoolers from the experimental sample compared to its traditional analog.

The obtained results confirm the findings of studies on related topics. For instance, in the study by E.E. Klopotova and T. Kuznetsova, it was shown that developmental DG (memories "Deer" and "Numbers") used for about 20 minutes a day can positively influence concentration, distribution, and switching of voluntary at-

tention [8]. In the work of V.A. Plotnikova, it was proven that children who prefer DG for quick reaction demonstrate a higher level of development of visual working memory compared to their peers who do not like playing such games [13]. Moreover, several studies have shown improvements in visuospatial working memory indicators in groups of preschoolers exposed to video games [18; 22].

Regarding digital games, it should be noted that the authors could not find studies specifically analyzing the impact of digital games on the memory and attention of preschoolers. In this context, it is worth highlighting the research conducted under the guidance of A.N. Veraksa [25; 29], as these projects focus on the relationship between digital and board games and the development of regulatory functions in children. These studies have shown that in the short term, digital games positively influence the formation of regulatory functions in preschoolers [29]. However, in the long term, the effect of digital games is not stable, and the best results are achieved through the use of board and role-playing games. The authors explain this by noting that role-playing and board games

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can not only improve individual executive function indicators but also reorganize inter-functional connections, leading to a qualitative shift in children's mental development [25].

It is necessary to dwell separately on the theoretical and methodological basis of the aforementioned works. The theoretical and methodological apparatus of most of these studies [13; 18; 25; 29] is based on the model of executive functions, understood as "a set of top-down mental processes necessary for concentration when automatic, instinctive, intuitive behavior becomes ineffective or impossible" [12, p. 62]. Executive functions include working memory, cognitive flexibility, and inhibitory control. Inhibitory control is responsible for selective attention, suppression of certain behaviors (self-control), and cognitive inhibition (interference control). Working memory integrates all the elements needed to solve a specific task that appears at different times. Cognitive flexibility involves adapting to changing demands or priorities and allows transitioning from one rule to another [1; 12].

The authors of this study, in turn, rely on the Cultural-Historical Concept and Activity Theory (works of L.S. Vygotsky, A.R. Luria, S.L. Rubinstein, A.N. Leontiev), where cognitive (intellectual and thinking) processes are inextricably linked with activity and are considered, along with emotional and volitional processes, as an integral characteristic of mental processes. Mental processes are formed within the context of various specific activities. In other words, it is in the process of activity, specifically play activity for preschoolers, that the formation and development of cognitive processes such as attention and memory occur [10; 11; 14].

It is also essential to emphasize that the authors of this study paid particular attention to the "purity of the experiment" by selecting a board game that met several characteristics. Firstly, the game involved memory and attention. Secondly, the printed and digital versions of the game were as visually similar as possible. Thirdly, a mandatory feature of the digital version of the game was the possibility for collaborative play, with each child playing from their own device. Fourthly, in both the board and digital games, the researchers encouraged interaction among the children. Thus, the authors aimed to make the board and digital game situations as identical as possible. This approach underlines the novelty and originality of this study.

Interestingly, despite the differences in theoretical and methodological approaches, the results of the aforementioned studies and the research presented in our work are remarkably similar. All studies have demonstrated that moderate use of digital games can positively affect the development of visual memory and voluntary attention. The use of various theoretical and methodological approaches and research designs further confirms the reliability of the obtained data.

As potential future directions for this project, expanding the diagnostic tools and increasing the sample of respondents could allow for the extrapolation of the observed effects to a broader audience. Based on the results of similar studies, it also seems important to conduct follow-up diagnostics several months after the experiment's conclusion to obtain data on the long-term impact of digital and board games on the development of cognitive processes.

The obtained data are of interest to psychologists, educators, and parents, and can be used in planning and conducting educational and play activities in preschool educational institutions.

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Attitude to Cheating and its Correlation with Social Beliefs and the Supposed Attitude of Others

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Academic dishonesty is a widespread but dangerous phenomenon, as it forms tolerance for fraud in other areas, including through tolerance of the dishonesty of others. The article is devoted to the analysis of the correlation between the subjective assessment of the permissibility of academic dishonesty and belief in a competitive world (BCW), the supposed assessment of peers and adults among schoolchildren, loyal and not loyal to dishonesty. It is considered both the attitude towards cheating itself (active dishonesty), as well as the message about the dishonesty of others and the refusal to help in dishonesty (passive dishonesty). 507 people were recruited for the research, 296 of them girls, aged from 13 to 18 years, average age of 15,6 (±1,38), who completed the questionnaire online. The level of BCW was measured using the questionnaire "Scale of belief in a competitive world, short version" by J. Dakkit adapted by O.A. Gulevich and colleagues. To assess the permissibility of cheating, were used vignettes, which described dishonest behavior and judgments about this behavior. Participants were supposed to assess them on a Likert scale from 1 to 9. Each type of dishonesty (cheating itself, reporting cheating and refusing to help with cheating) was represented by 3 vignettes. The results showed that the assessments of the admissibility of certain aspects of cheating are not related to each other and have a different structure of links with the BCW and the intended assessment of others. The results confirm the data on the greater complexity of honesty compared to dishonesty. For the disloyal, the permissibility of cheating is associated with more factors than for the loyal. Active dishonesty in loyal people is associated with prevalence, in disloyal people — with BCW and the opinion of parents.

Keywords: academic dishonesty; high and low loyalty to cheating; perceived norms; belief in a competitive world.

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Связь отношения к читерству с социальными верованиями и предполагаемым отношением других у старшеклассников

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Представлены материалы анализа связи субъективной оценки допустимости академической нечестности с верой в конкурентный мир (ВКМ), предполагаемой оценкой сверстников и взрослых у школьников, лояльных и нелояльных к нечестности. Подчеркивается, что академическая нечестность широко распространенное, но опасное явление, так как формирует терпимость к мошенничеству и в других сферах, в том числе и за счет терпимого отношения к нечестности других. Рассматривается как отношение к собственно читерству (прямой нечестности), так и к сообщению о нечестности других и отказу помочь в нечестности (косвенной нечестности). Выборку составили 507 человек, из них 296 девушек, возраст — от 13 до 18 лет, средний — 15,6 (±1,38), заполнявших опросник онлайн. Уровень ВКМ измерялся с помощью опросника «Шкала веры в конкурентный мир, краткая версия» Дж. Даккита в адаптации О.А. Гулевич и коллег. Для оценки допустимости читерства использовались виньетки с описанием нечестного поведения и суждения об этом поведении, согласие с которым нужно было оценить по шкале Ликерта от 1 до 9. Каждый вид нечестности (собственно читерство, сообщение о читерстве и отказ помочь в читерстве) был представлен 3 виньетками. Установлено, что оценки допустимости отдельных аспектов читерства не связаны друг с другом и имеют различную структуру связей с ВКМ и предполагаемой оценкой других (одноклассников, учителей, родителей). Результаты подтверждают данные о большей сложности честности по сравнению с нечестностью. Также полученные данные показали, что у нелояльных допустимость читерства связана с большим количеством факторов, чем у лояльных.

Ключевые слова: академическая нечестность; высокая и низкая лояльность к читерству; воспринимаемые нормы; вера в конкурентный мир.

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Introduction

Academic dishonesty (cheating) is an unpleasant phenomenon, but widespread [1; 3; 15; 18], it manifests itself in various forms, but in all cases it involves violating academic rules for the sake of some benefits. Cheating lays down so-called "neutralizing attitudes" [14], which contribute to the fact that dishonesty becomes possible, since it is normal [19] and as a result it is reproduced in the workplace [17].

The attitude to dishonesty includes both an assessment of the permissibility of their own dishonest behavior (direct dishonesty), and an assessment of the message that someone is cheating and agreeing to help the cheater (indirect dishonesty). The subject of the research in the work is the connection between the assessment of the permissibility of direct and indirect cheating with general ideas about whether there are rules in the world and how they work, about its prevalence, the expected reaction of classmates, teachers and parents among high school students who are loyal and not loyal to dishonesty.

Belief in a competitive world (BCW), in accordance with the theory of J. Dakkitta [7] is based on the belief that there are no rules, the world is built on the agreement of everyone with everyone and everything is possible to achieve goals. In such a world, dishonesty is not only acceptable, but also desirable. Research shows that BCW is directly related to self-esteem of dishonesty [5], willingness to cheat at a job interview [9] and corrupt intentions [26]. Although the contribution of BCW to the assessment of the permissibility of cheating among schoolchildren has not been sufficiently studied, it can be assumed that in the perception of a world in which there are no rules, cheating will be considered acceptable.

Both declarative and perceived norms contribute to the assessment of the permissibility of a particular behavior. Declarative ones are fixed in official rules, and perceived ones are a subjective idea of what is possible and what is not possible in the current social reality, what will be approved or not approved [16]. In cases where perceived norms do not coincide with declarative ones, behavior is determined by the influence of perceived ones, since their processing for decision-making is based on heuristic (obvious) rather than systematic information processing, which requires less cognitive effort [13].

Research shows that the assessment of the prevalence of cheating is one of the most significant predictors of dishonesty among students and schoolchildren [6; 10; 15; 18; 30]. The strong influence of peer behavior may indicate that academic dishonesty is not only learned by observing peer behavior, but also that peer behavior provides a kind of normative support for deception [15].

Perceived norms are formed both from a subjective assessment of the extent of dishonesty, and from the expected reaction of others, which for schoolchildren are classmates, teachers, parents. The likelihood of cheating increases in a situation where a person is sure that others, especially classmates, will not report the violation, and, if necessary, will help to deceive, and adults will not condemn or punish.

The willingness of students to report rule violations is considered one of the significant factors in reducing dishonesty [22], but research shows that it is not common and is considered very undesirable behavior [3; 22; 23; 27; 29]. Anyone who decides to report violations on the part of a friend risks being rejected by the team [22].

Another important component of the attitude towards cheating is assistance in

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fraud. In this case, the assistant also behaves dishonestly, but does it for the sake of another, which can be perceived as morally acceptable behavior [28]. However, the attitude towards the decision to help or refuse dishonesty and the relationship of the decision with the assessment of the admissibility of active dishonesty and other factors have not been sufficiently investigated.

The real disapproval of cheating on the part of classmates and classmates is one of the most significant factors in preventing dishonesty [12; 15; 30]. If many students have a negative attitude towards cheating, then it is difficult to get help with cheating, and there is a high probability that someone informs a teacher [12].

Although the opinion of adults is in many cases less important for high school students than the opinion of their peers, studies, according to the results of a meta-analysis by G. Tabares and colleagues [24] show a significant contribution of the position of parents to the prosocial behavior of adolescents. This allows us to assume that parents' opinions about various aspects of cheating are related to the assessment of the permissibility of such behavior.

The position of teachers also plays an important role. Cheating among schoolchildren is significantly inversely related to the disapproval of teachers [1], and the willingness to report dishonesty is directly related to teachers' support for such behavior [23].

However, research shows that in the same conditions, people cheat to varying degrees. And, although the level of deception in laboratory experiments is directly related to the general honesty index in the country [8], people who are influenced by common perceived norms differ in their tendency to deceive [11; 21]. Unlike most traits, the levels of dishonesty do not have a normal distribution,

and depending on the tasks, either a small part of the participants lie to the maximum extent, or a small part lies minimally [11]. It is relevant to identify the psychological differences between "liars" and "non-liars". For example, students who are loyal and disloyal to dishonesty have a different structure of connection with faith in a just world and the possible results of dishonesty [4].

This suggests that the permissibility of dishonesty among loyal and non-loyal schoolchildren also has a different structure of connections with the idea of the existence of rules and norms in the world, which is reflected in the BCW, with the prevalence of cheating and the expected reactions of others.

The study was organized to test the following hypotheses:

1. Students loyal to dishonesty rate the prevalence of direct and indirect cheating significantly higher, and the negative reaction of classmates, teachers and parents significantly less than disloyal ones.

2. Those loyal to dishonesty consider both direct and indirect cheating less acceptable than those who are not loyal, the reaction of classmates is more negative, and adults are more positive.

3. Students who are loyal to dishonesty have significantly higher BCW than those who are disloyal.

4. Direct and indirect forms of dishonesty are directly related to both loyal and disloyal dishonesty.

5. The permissibility of all forms of dishonesty among those loyal to cheating is directly related to the BCW, the prevalence assessment, and vice versa — with the alleged negative reaction to the dishonesty of classmates.

6. The permissibility of dishonesty among those who are disloyal to cheating

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is directly related to BCW and the alleged negative reaction of adults.

Empirical Research

Sampling and methods

The study participants were 507 people, 296 of them girls. Age from 13 to 18 years, average 15.7. The differences in age are not significant.

The level of BCW was measured using the questionnaire "Scale of faith in the competitive world, short version" [2], consisting of 12 statements. Examples: "Money and wealth are exactly what is valuable in life," "A person who has an advantage in a situation should use it in any way to achieve his goal." Agreement with the statements is assessed on a 5-point Likert scale.

3 vignettes were used in each case to analyze attitudes towards the permissibility of cheating, reporting cheating to the teacher and refusing to help with cheating.

After each vignette, participants were asked to rate agreement with the following statements on a 9-point Likert scale.

1. This is a common behavior.

2. If classmates find out about it, they will treat him worse.

3. He will have disagreements and misunderstandings with teachers or the administration, which may develop into a conflict.

4. If parents find out about this, they will most likely disapprove of his actions.

The analysis of the results showed that the Cronbach's alpha for agreeing with the statements for all vignettes is 0.795, which indicates a fairly high consistency of responses and makes it possible to consider the total value as an indicator of the admissibility of dishonesty. Gender differences are not significant in all cases, which made it possible to consider the sample as a whole, without dividing subgroups of girls and boys.

Statement of results

To identify subsamples with high and low levels of cheating tolerance, the upper and lower quartiles of the distribution of the agreement were used with the statement that it is possible to do so. The subsample with a low tolerance of cheating consisted of 127 respondents with scores from 3 to 9 points (the lower quartile of the general distribution), the subsample with a high tolerance included 126 respondents with scores from 18 to 27 points. Since in most cases the distribution in the subsamples according to the Shapiro-Wilk criterion differed from the normal one, non-parametric criteria were subsequently used.

The analysis of the results showed that the permissibility of dishonesty has no significant links with the permissibility of reporting the dishonesty of others and with the permissibility of refusing to participate in dishonesty for either loyal or disloyal to dishonesty, which suggests the absence of a holistic attitude of schoolchildren to cheating.

The Mann-Whitney criterion was used to test the hypothesis of differences in agreement with judgments and the level of BCM. The results are shown in Table 1.

Spearman's criterion was used to test the hypothesis of the correlation between assessing the admissibility of dishonesty, reporting the dishonesty of others and refusing to participate in dishonesty with social beliefs and the alleged attitude of others. The results are presented in Table 2.

Discussion

The results of comparing agreement with judgments about cheating options suggest that loyal and non-loyal students of

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Table 1

Differences in agreement with statements and the level of social beliefs among students who are loyal and disloyal to dishonesty

	Disloyal to dishonesty				Loyal to dishonesty					
	Mean	Std.Dev.	Skewness	Kurtosis	Mean	Std.Dev.	Skewness	Kurtosis	U	Effect size
The permissibility of dishonesty										
Prevalence	13,323	4,963	0,033	-0,443	20,738	4,400	-0.367	-0,595	2208,0****	0,724
Deterioration of classmates' relationships	16,283	3,390	0,341	2,630	14,151	3,816	-1,030	2,450	5871,0***	0,266
Problems with teachers	17,929	5,790	-0,310	-0,439	15,794	6,660	-0,111	-0,811	6507,5	0,187
Disapproval of parents	20,118	5,570	-0,689	-0,174	14,929	6,454	-0,124	-0,779	4342,0****	0,457
The message of dishonesty										
Prevalence	10,780	6,309	0,770	-0,010	11,841	7,442	0,550	-0,762	7533,5	0,058
Acceptable	10,142	6,934	0,810	-0,212	8,563	6,357	1,070	0,390	6874,5	0,141
Deterioration of classmates' relationships	21,370	5,425	-1,17	1,57	22,183	5,262	-0,853	-0,207	7188,0	0,102
Problems with teachers	11,024	6,889	0,634	-0,362	12,262	7,118	0,408	-0,515	7220,5	0,098
Disapproval of parents	14,906	6,592	-0,022	-0,546	17,214	6,252	-0,253	-0,294	6349,5*	0,206
Refusal to help with dishonesty										
The prevalence of failure	15,646	6,060	-0,075	-0,497	16,397	6,433	-0,057	-0,611	7454,0	0,068
Acceptable	16,685	6,234	-0,183	-0,560	14,627	6,416	0,121	-0,648	6502,0	0,187
Deterioration of classmates' relationships	18,031	4,381	-0,306	1,540	19,651	4,733	-0,149	-0,276	6474,5	0,191
Problems with teachers	10,055	5,096	0,318	-0,541	12,127	7,011	0,338	-0,734	6693,5	0,163
Disapproval of parents	11,614	5,326	-0,036	-0,754	14,175	5,894	0,141	-0,114	6089,5***	0,230
BCW	44,276	15,258	-0,008	-0,489	59,833	13,133	-0,061	0,811	3433,5****	0,571

Note: * — <0,05, ** — <0,01, *** < 0,001, ****< 0,0001 The significance is given taking into account the Bonferroni correction.

the same school have different perceived norms of direct dishonesty, and that for loyal students, dishonesty is more consistent with perceived norms and the assumed opinion of peers. These differences can be explained by the effect of false agreement

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Table 2

**The correlation of assessing the acceptability of dishonesty, reporting
the dishonesty of others and refusing to participate in dishonesty
with the perceived attitude of others and social beliefs**

	Disloyal to dishonesty			Loyal to dishonesty		
	Dishonesty	Message	Refusal	Dishonesty	Message	Refusal
Prevalence	0,109	0,464****	0,466****	0,414****	0,481****	0,260
Deterioration of classmates' relationships	-0,039	-0,311***	-0,046	-0,166	-0,680****	-0,194
Problems with teachers	-0,093	-0,035	-0,335***	-0,01	-0,369****	-0,115
Disapproval of parents	-0,381***	-0,207	-0,319***	0,089	-0,099	-0,031
BCW	0,290**	-0,023	-0,338****	0,025	-0,098	-0,092

Note: * — <0,05, ** — <0,01, *** < 0,001, ****< 0,0001 The significance is given taking into account the Bonferroni correction.

[20], according to which people tend to attribute their vision of the world to the majority. And the difference in parents' reactions is most likely due to real differences in family upbringing.

However, the idea of the prevalence of indirect dishonesty and the reaction of others to it among those loyal and not loyal to cheating are similar. Indirect dishonesty is carried out in a social context and its perception can be more objective.

As expected, the permissibility of all aspects of cheating has a different structure of connection with BCW and the expected reaction of others. The rejection of dishonesty, as a more complex behavior among those who are not loyal to cheating, is not related to the reproduction of what can be directly observed, but to the norms learned from parents and the general idea of how the world works. Research [25] shows that honesty requires greater cognitive resources, and schoolchildren need more grounds for honest behavior, both the general low belief that not all means are good, and the opinion of parents. In the

absence of such restraining factors, students act primarily on the basis of a direct impulse, relying solely on perceived norms.

The links of the permissibility of indirect dishonesty, which presupposes social interaction, are structured differently.

The structure of the links between the permissibility of reporting cheating is similar for both loyal and disloyal. Schoolchildren are guided only by perceived norms, and loyal ones are also guided by the opinion of teachers. This corresponds to the data of Stevenson and colleagues on the dependence of the probability of reporting dishonesty on the behavior of teachers [23]. The connection with the BCW and the opinion of the parents is not significant in any case. The fact that it is impossible to "surrender" others is supported by social relations and is not related to ideas about the structure of the world.

For those who are disloyal to dishonesty, refusal to help is associated with almost all the factors considered, except for the reaction of classmates. Perhaps this is a rather difficult decision for them, affecting both the

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general idea of rules and social norms. And for loyal people, no connection is significant, probably the decision is made without taking into account the factors considered, for example, on the basis of sympathy for those asking or their own benefits.

Conclusions

The data obtained are consistent with the idea that honesty is more complex than dishonesty, clarifying the differences in the nature of the correlation between active and passive dishonesty with perceived norms and one's own values.

Direct dishonesty (self-cheating) among the non-loyal is related to the general idea of the world, the value system and the opinion of parents and is not related to perceived norms. And for loyal people, the permissibility of their own dishonesty is related to the behavior and reaction of others, but not to the BCW and parental attitudes.

The correlation of indirect forms of cheating with other factors is differentiated in both loyal and disloyal people. Reporting the dishonesty of others, as a condemned action, is associated with perceived norms for everyone. There are probably no uniform standards for helping others to be dishonest. And for the loyal, it is probably related to factors that were not taken into account in the study, and for the non-loyal, the decision to help is related to all factors except the opinion of the teachers.

Perhaps the reasons for the different attitudes towards dishonesty in a single environment are determined by the difference in family upbringing, which needs special study, as well as the possibility of forming other collective norms.

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The Big Five Personality Traits as a moderator of the Relationship between Foreign Language Classroom Anxiety and Creative Personality

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The current research is devoted to determining the influence of creative personality traits and Big Five personality traits on the components of foreign language anxiety (test anxiety, communication apprehension, and fear of negative evaluation). Respondents (*N*=452) aged between 16 and 45 (*M*=23,41, *SD*=7,22) received the Renzulli Creative Personality Assessment scale, the Big Five Personality Traits survey proposed by Gosling, Renftrow and Swann, and the foreign language classroom anxiety scale (FLCAS) proposed by Horwitz. The present study hypothesised that creative personality traits influence FLCA components, and the Big Five moderate the relationship between creative personality and FLCA. The results of the study showed that the scale of creative personality predicts all FLA components. It was also concluded that agreeableness moderates the relationship between creative personality and FLA in groups with a certain socio-economic status. Based on the results, we suggest that teachers pay more attention to the individual differences of students control the level of language anxiety.

Keywords: foreign language classroom anxiety; foreign language learning; creative personality; Big Five personality traits.

Большая пятерка личностных черт как модератор связи между языковой тревожностью и чертами креативной личности

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Представлены результаты исследования, посвященного определению характера связи черт креативной личности и личностных черт Большой пятерки с компонентами языковой тревожности (тревожность при тестировании, боязнь общения и боязнь негативной оценки). Респондентам (*N*=452) в возрасте от 16 до 45 лет (*M*=23,41, *SD*=7,22) были предложены шкала оценки креативной личности Рензулли, опросник личностных черт Большой пятерки (С.Д. Гослинг, П.Д. Ренфтроу, В.Б. Свонн мл.), и шкала языковой тревожности на занятиях иностранным языком Е.К. Хорвитц. Гипотеза настоящего исследования состояла в том, что черты креативной личности определенным образом связаны с компонентами языковой тревожности (ЯТ), а пять основных черт Большой пятерки модерируют отношение между чертами креативной личности и ЯТ. Результаты проведенного исследования показали, что шкала креативной личности определяет уровень языковой тревожности. Также было установлено, что доброжелательность является модератором связи между креативной личностью и языковой тревожностью в группах с определенным социально-экономическим статусом (СЭС). На основании полученных результатов преподавателям предлагается обращать особое внимание на индивидуальные различия обучающихся с целью контроля уровня языковой тревожности.

Ключевые слова: языковая тревожность; изучение иностранного языка; креативная личность; Большая пятерка личностных черт.

Introduction

Nowadays, creativity and its nature have become of great interest in many fields — from fashion design and literature to business and management. Creativity became one of the central topics in education in general [23;37] and in foreign language acquisition in particular [26; 35; 43]. Meanwhile, teachers, linguists, psychologists, and experts in cross-cultural communication aim to indicate predictors of success in foreign language acquisition [4; 6]. The success of language acquisition is linked to a student's ability to be an independent and self-governing learner. Since creativity is associated with brand-new ideas, imagination, and experiments [43],

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it is no surprise that there are creative approaches to teaching a foreign language.

Horwitz, Hortwitz, and Cope were the first ones to suggest the term *foreign language anxiety* (FLA) [24]. According to their study, FLA consists of the following components: test anxiety, communication apprehension, and fear of negative evaluation. According to MacIntyre and Gardner, FLA is situation-specific anxiety that is associated with a feeling of tension in language learning [33]. FLA is closely related to academic performance and language achievement [22] and leads to low self-esteem, lack of self-confidence, and difficulty acquiring new information [47].

An extensive body of literature focuses on FLA sources [31; 41]. Some studies suggest that sociodemographic factors influence FLA. For instance, it was found that some socioeconomic status (SES) contribute to FLA. Subjective SES means how individuals evaluate their social class compared to others [14]. Thus, fear of negative evaluation, communication apprehension and test anxiety were significantly predicted by the current subjective SES of the respondents [17]. Other studies suggest that FLA is predicted by internal and external motivation [29; 30], language aptitude [34], and personality traits [48; 49]. One of the most popular models to assess is the Big Five Personality Traits (BFPT). This model includes five dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (emotional stability), and there are many studies about the influence of the BFPT on different constructs [15; 38; 42; 45].

There are several definitions of creative personality [44; 49]. High levels of intelligence, openness to experience and emotion, freedom from restraints, aesthetic sensitivity, flexibility, and independence in thoughts and actions are the characteristics of a creative personality, according to Vervalin [49]. According to Stein, a creative personality is a curious, self-assured, and ambitious achiever [44]. They are also self-critical, conventional, self-sufficient, intuitive, and empathic.

Some studies investigated the relationship between the BFPF and creativity [23; 25; 27]. Kaspi-Baruch concluded that high extraversion and emotional stability, together with low conscientiousness result in the highest creativity levels in individuals oriented toward learning [27]. They suggested that openness predicted creativity. This finding is in line with Jir sek and Sudzina's research [25]. The same study found similar yet less significant evidence for the link between extraversion and creativity. They also found a negative relationship between conscientiousness and creativity. Unlike most studies,

At the same time, numerous studies investigated the influence of BFPF on FLA development [7; 13; 32; 42]. Some studies reported a significant positive relationship between neuroticism and FLA [7;13]. On the contrary, MacIntyre and Charos did not find any connection between emotional stability and language anxiety [32]. There are also inconsistent findings regarding the link between extraversion and FLA. MacIntyre and Charos suggested that FLA is associated with higher levels of extraversion [32]. However, Dewaele found that the relationship between these two variables is only moderately significant and was only found in one sub-group [13]. Vural suggested that all five personality traits predict anxiety — openness, conscientiousness and extraversion are negatively related, whereas agreeableness and neuroticism are positively related to speaking anxiety [50]. Toyama and Yamazaki pointed out two BFPFs that influence FLA — neuroticism and openness to experience [48]. Erzhanova, Kharkhurin and Koncha suggested neuroticism, extraversion, and openness to experience predict all three components of FLCA [16].

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Similarly, certain studies discovered associations between trait anxiety and creativity [10]. They found significant positive correlations between creative ability and trait anxiety. More frequent research on negative correlations suggested that other factors may moderate the relationship between these two factors [9]. Daker and colleagues found that levels of anxiety were higher for situations that required creativity compared with the same situations that did not [11].

The reviewed literature suggested a relationship between FLA and creativity. At the same time, BFPT revealed an influence on both FLA and creativity. These findings raise the question: can BFPT impact the existing relationship between creative personality and FLA components?

Present study

The current study examines the influence of BFPT on the relation between creative personality and FLA. We advanced the following hypotheses: First, creative personality predicts FLA components of fear of negative evaluation, test anxiety, and communication apprehension. Second, BFPT moderates the relationship between creative personality and FLA component.

Methods

Participants

Four hundred twenty-four individuals (66 males and 358 females) aged between 16 and 45 (M=23.41, SD=7.22) participated in the survey. All respondents were foreign language learners. The recruitment of the participants was organised through social media (VK, Facebook). The respondents were native Russian speakers from 31 countries, mostly from Russia (317) and Kazakhstan (31). We ensured that all respondents were competent in Russian because the survey was administered in that language; their self-reported proficiency in Russian was M=4.72 out of 5.00 (SD=.69;

see description of the language assessment below).

Procedure

The data was collected online using a reliable survey platform (www.1ka.si/). It took roughly 20 minutes to complete the survey. Before taking part in the survey, the respondents were informed that their participation was voluntary and uncompensated. The HSE University Ethics Committee approved the survey and the informed consent form was presented to participants.

Instruments

Socioeconomic status

To evaluate respondents' socioeconomic status (SES), we asked them to indicate their SES on a 5-point Likert scale (very advantaged, advantaged, average, disadvantaged, very disadvantaged). The same instrument was used in the studies by Kharkhurin and Okamoto [28; 36].

Foreign Language Anxiety Assessment

Participants' levels of FLA are assessed using the Foreign Language Classroom Anxiety Scale (FLCAS) [24]. We used a Russian version of the survey adapted by Kalganova and Mardanshina [2]. FLCAS demonstrated high internal consistency (α=.93) [24]. 33 5-Likert scale items from the questionnaire are divided into three categories: test anxiety, communication apprehension, and fear of negative evaluation. «I am usually at ease during tests in my class» is an example of a test anxiety item. «I get nervous when I do not understand every word the teacher says» is an example of a communication item. «I feel confident when I speak in the class» represents a fear of a negative evaluation item. The participants' overall scores ranged from 33 to 132 points; greater scores indicated more anxiety on each scale.

Creative Personality

To assess creative personality, we used the adapted version of The Scale

for Rating Behavioral Characteristics of Superior Students [39]. The survey has four subscales — learning, motivation, creativity, and leadership. The only scale used in this study is the Creative Personality scale, which consists of 10 4-point Likert-type questions assessing a person's creativity. One example of an item is "A high-risk taker; adventurous and speculative". The maximum score is 40 points, calculated as the sum of all answers to all questions. According to Renzulli., the Creative Personality Characteristics scale has a good coefficient of stability (α=.79, p<.01) [39].

Personality traits assessment

The adapted version of the Ten Item Personality Inventory for Russian-speaking people was used to evaluate the personality traits of the participants [21]. The initial assessment was developed by Gosling, Rentfrow and Swann and includes a list of ten pairs of adjectives (two pairs representing each personality trait) [20]. The russian version of it was adapted by Tunik [5]. Each pair of terms represents opposite poles of the personality traits. On a 7-point Likert scale, the participants were asked to evaluate how well these combinations suit their personalities ("I view myself as..."). The five subscales included in the evaluation tool include openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Kornilova and Chumakova employed the forward-backwards and dual-panel processes to translate the questionnaire into Russian [3].

Results

Correlational analyses

Table 1 presents descriptive statistics (means and standard deviations) and Pearson correlations for the research variables. The correlation analysis depicts the way how different scales of BFPT and FLA questionnaires are correlated.

Agreeableness is found to be associated with conscientiousness (r=-.302, p<.01), creative personality (r=.104, p<.05), and fear of negative evaluation (r=.105, p<.05). Conscientiousness was negatively associated with openness to experience (r=-.386, p<.01) and creative personality (r=-.132, p<.01).

In addition, neuroticism was positively associated with creative personality

Table 1

Correlation matrix between the research variables in the current study (N = 424)

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Extraversion	3.38	.89	—								
2. Agreeableness	3.17	1.16	-.049	—							
3. Conscientiousness	4.40	1.03	.108*	-.302**	—						
4. Emotional stability	2.98	1.16	-.127**	.058	-0.042	—					
5. Openness to experience	4.02	1.11	-.027	.021	-.386**	-.030	—				
6. Creative Personality	23.13	5.49	-.148**	.104*	-.132**	.447**	.078	—			
7. Fear of negative evaluation	39.88	12.34	-.193**	.105*	-.014	.222**	-.188**	.217**	—		
8. Communication apprehension	39.31	13.44	-.264**	.074	0.013	.234**	-.187**	.295**	.861**	—	
9. Test anxiety	8.22	2.98	-.190**	.028	0.078	.172**	-.212**	.151**	.710**	.717**	—

Note. * p < .05. ** p < .01.

(r=.447, p<.01) as well as with all three components of foreign language anxiety: fear of negative evaluation (r=.222, p<.01), communication apprehension (r=.234, p<.01) and test anxiety (r=.172, p<.01). Openness to experience was significantly correlated with fear of negative evaluation (r=−.188, p<.01), communication apprehension (r=−.187, p<.01), and test anxiety (r=−.212, p<.01).

Fear of negative evaluation was found to be positively related to communication apprehension (r=.861, p<.01) and test anxiety (r=.710, p<.01). In turn, communication apprehension was positively associated with test anxiety (r=.717, p<.01).

H1: Creative Personality Contributes to Foreign Language Anxiety

Table 2 presents the results of the linear regression analysis used to test the first hypothesis on how creative personality may predict foreign language anxiety (fear of negative evaluation, communication apprehension and test anxiety). The results demonstrate that the creative personality contributes to all three components of foreign language anxiety: fear of negative evaluation (β=.082, p<.01), communication apprehension (β=.723, p<.001) and test anxiety (β=.488, p<.001). Therefore, it can be concluded that a creative personality contributes to foreign language anxiety. So H1 is confirmed.

H2: BFPT moderates the relationship between creative personality and foreign language anxiety components

Finally, we tested the hypothesis about the moderation effect of BFPT on the relationship between creative personality and foreign language anxiety components. To test the moderation hypotheses, a regression model according to Figure 1 was constructed.

Annex A presents the results of the moderation paths for the creative personality variable. The results demonstrate some weak interaction effects between agreeableness on the relationship between creative personality and test anxiety and agreeableness on the relationship between creative personality and communication apprehension. However, the R square for both models is low (R^2=.095 and .030 respectively), therefore, it is impossible to conclude an interaction effect between the research variables.

However, following the previous research findings by Erzhanova and colleagues, there is a need to investigate the relationship between the research variables by dividing the sample into sub-groups of the SES of the respondents [17]. Annex B presents the detailed results of the sub-group moderation analysis. We do not consider the models with interaction effects where R2 is rather low. As recommended by Dawson, the moderator was divided into low and high slopes based on the outcome in which low

Table 2

Results of linear regression analysis between Creative Personality and Foreign Language Anxiety (N = 424)

Predictor	Outcome	Estimate	SE	t	p	Stand. Estimate	95% Confidence Interval	
							Lower	Upper
Creative Personality	Test anxiety	.082 **	.026	3.147	.002	.151	.031	.133
	Communication Apprehension	.723***	.114	6.350	.000	.295	.499	.946
	Fear of Negative Evaluation	.488	.107	4.575	.000	.217	.278	.698

Note. * p < .05. ** p < .01. *** p < .001.

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Direct effect (not via moderator)

Moderator

Extraversion
Agreeableness
Openness to
experience
Emotional stability
Consciousness

Creative Personality

Foreign language anxiety:
-fear of negative evaluation
-communication apprehension
-test anxiety

Moderator

Direct effect (not via moderator)

Fig. 1. A conceptual model of the association between research variables

and high values for quantitative moderators are mean and minus/plus one SD from the mean for all moderation models [12].

Considering the moderation model of the agreeableness on the link of creative personality on test anxiety, the results showed that this interaction occurs in the high slope of the moderator (β=-.382, *p*<.05) for very advantaged SES, in the high slope of the moderator (β=.341, *p*<.001) for advantaged SES. As for the moderation effect of the agreeableness on the relationship between creative personality and communication apprehension, the results demonstrate that this interaction occurs in the low slope of the moderator (β=-.854, *p*<.01) and in the high slope of the moderator (β=1.643, *p*<.001) for the advantaged SES group. The results of the moderation analysis of agreeableness on the creative personality and fear of negative evaluation showed that the interaction occurs in the high slope of the moderator (β=1.375, *p*<.001) for the advantaged SES group.

Considering the moderation model of the extraversion on the link between creative personality and fear of negative evaluation, the results showed that this interaction occurs in the high slope of the moderator (β=1.025, *p*<.01) for very advantaged SES.

As for the moderation effect of emotional stability on the relationship between creative personality and communication apprehension, the results demonstrate that this interaction occurs in the low slope of the moderator (β=-7.048, *p*<.05) for a very advantaged SES.

Considering the moderation model of the openness to experience on the link of creative personality on test anxiety, the results showed that this interaction occurs in the low slope of the moderator (β=.648, *p*<.05) for very advantaged SES.

Discussion

The current research investigates whether creative personality impacts FLA develop-

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ment and whether there is a moderating effect of the BFPT on the relationship between creative personality and FLA. The study's results demonstrate that creative personality is a positive predictor of FLA. Interestingly, we also found that some of the BFPT have a moderating effect on the relationship between creative personality and FLA components in only advantages and very advantages SES groups. Thus, agreeableness has a moderating effect on the relationship between creative personality and FLA. Extraversion, emotional stability and openness to experience were found to be moderators between creative personality and fear of negative evaluation, communication apprehension and test anxiety respectively. At the same time, openness to experience moderates the relationship between creative personality and communication apprehension.

Creative Personality predicts FLA

The results of the current study suggest that creative personality predicts fear of negative evaluation, communication apprehension, and test anxiety. Interestingly, higher scores of creative personality are associated with higher levels of FLA components. The predictive nature of creative personality for FLA contradicts some previous findings in the literature. According to some authors, creativity is positively related to an individual's mental health as it promotes relaxation and reduces stress [40]. In the current research, we speculate that creative personality predicts all three components of FLA since sensitive people are more creative [8].

Reflected by higher levels of neuroticism, creative personalities often report high anxiety scores [19]. It might also be explained by the findings that the creative process is often associated with a lack of energy and intense frustration [18]. The same study highlights that creative individuals are inclined to doubt themselves, as novelty and originality demand develop-

ing new skills and ideas. Learning a foreign language requires much time and effort, and there is never an immediate result. It takes much practice and patience to master a new language, while creative people are often impatient.

Moreover, creativity is associated with imagination [1]. Creative individuals might feel extra tension when speaking a foreign language or taking a language exam, as they can vividly imagine the possible consequences of making mistakes in that context. These feelings of frustration and self-doubt might be the grounds for developing a fear of negative evaluation, communication apprehension, and test anxiety.

Agreeableness has a moderating effect on the relationship between Creative Personality and FLA in advantaged SES groups

Based on the study results, agreeableness has a moderating effect on the relationship between creative personality and all FLA components in advantaged SES groups. Being associated with an advantaged SES might lead to having expectations for achievement and success. First, agreeableness lead to a stronger positive relationship between creative personality and fear of negative evaluation. We speculate that these expectations from an advantaged group contribute to feeling pressured to perform well in evaluative situations, while people with high scores in agreeableness also tend to follow the rules [46]. Second, higher levels of agreeableness lead to a stronger positive relationship between creative personality and communication apprehension. This FLA component is "social" as it involves the context of direct interaction with people. At the same time, agreeableness is also a socially oriented trait. We speculate that the moderating role of agreeableness, in this case, is connected to these constructs' great extent of social orientation, especially in advantaged SES groups, where the image

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and impression they have on a companion are important. Third, agreeableness has a moderating effect on the relationship between creative personality and test anxiety. According to some studies, agreeableness positively relates to academic performance [38]. We speculate that by being academically more successful, learners feel more pressure in the examination context.

Extraversion has a moderating effect on the relationship between Creative Personality and Fear of Negative evaluation in advantaged SES groups

We found that, for a very advantaged SES group, extraversion is a moderator between creative personality and fear of negative evaluation. We speculate that a very advantaged SES group has better access to resources, that can amplify the positive effects of a creative personality (creative workshops, social skills training, innovative thinking). High creative personality enhances the positive aspects of extraversion, which might contribute to reducing fear of negative evaluation.

Emotional stability has a moderating effect on the relationship between Creative Personality and Communication Apprehension in advantaged SES groups

Based on the results, agreeableness moderates the relationship where higer levels of creative personality leads to higher level of communication apprehension. Individuals with low emotional stability are more sensitive to feedback and more likely to perceive others' responses as critical or negative, leading to higher communication apprehension.

Openness to experience has a moderating effect on the relationship between Creative Personality and Communication apprehension and Test Anxiety in specific SES groups

Individuals with high openness are generally more adaptable and resilient in the face of challenging situations like tests. They may see tests as opportunities for learning and intellectual engagement rather than threatening. In advantaged SES groups, where educational environments might be more stimulating and supportive, high openness can mitigate test anxiety. These students may benefit from education that encourages exploration and creative problem-solving, making test situations less stressful.

Conclusion

Creativity is a viral construct in the education field. Many teachers and methodologists tend to implement creative approaches in the learning context and develop creativity in their students. However, the topic of creativity in foreign language acquisition is not fully understood to date. We found that creative personality contributes to all three FLA components — fear of negative evaluation, communication apprehension, and test anxiety. In addition, we also found that some of the BFPT have a moderating effect on the relationship between creative personality and FLA components in only advantages and very advantages SES groups.

The current research has some *limitations*. First, the age range of the respondents is considerably wide. Even though the recent study by Erzhanova, Koncha, and Kharkhurin suggested that age does not predict the level of FLA components [17], different age groups have specific personality characteristics, which might lead to different levels of FLA.

Second, the sample of the current research is gender imbalanced. The sample mainly consists of female representatives, which may play a role in the studied relationships between the variables.

Third, to assess the SES of the respondents we used a self-reported instrument containing one question about the perceived status of the participants. This might have impact on the responses due to social desirability and response bias. Also,

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to further investigate the influence of SES on FLA we suggest that a more complex instrument (involving questions about parents' level of education, level of income and employment status) is used.

This study has *theoretical and practical implications*. First, we aim to fill the gap in the literature regarding the role of creative personality in FLA. To date, there has been a lack of empirical research and evidence on how creativity relates to FLA. Second, unlike other findings that emphasise the stress-reducing role of creativity [49], the current research suggests that creative personality predicts FLA. Based on these findings, we recommend that teachers pay more attention to their learners and be more conscious when implementing creative techniques. Third, it is crucial to train teachers to understand the diverse needs of students with different personality traits and SES backgrounds. Workshops can focus on how to recognize and support creative personalities in language learning process.

Annex A

Results of moderating role of Big 5 components on Creative Personality — Foreign Language Anxiety link using standardized coefficients (N = 424)

Effect	β	SE	t	p	LLCI	ULCI
Constant	9.701	7.584	1.279	.202	-5.205	24.608
Direct effect of Creative Personality on communication apprehension***	1.224	.329	3.723	.000	.578	1.870
Direct effect of Agreeableness on communication apprehension+	4.153	2.255	1.841	.066	-.281	8.586
Creative Personality× Agreeableness+	-.160	.096	-1.663	.097	-.349	.029
$R^2 =.0951; F (3.420) =14.7134 . p =.0000$						
Effect	β	SE	t	p	LLCI	ULCI
Constant	14.983	12.120	1.236	.217	-8.8403	38.807
Direct effect of Creative Personality on communication apprehension+	.923	.519	1.779	.076	-.097	1.943
Direct effect of Conscientiousness on communication apprehension	1.621	2.614	.620	.536	-3.517	6.759
Creative Personality× Conscientiousness	-.041	.114	-.363	.717	-.264	.182
$R^2 =.0903; F (3. 420)= 13.8956. p =.0000$						
Effect	β	SE	t	p	LLCI	ULCI
Constant ***	47.284	10.565	4.475	.000	26.516	68.051
Direct effect of Creative Personality on communication apprehension	.163	.434	.374	.708	-.691	1.016
Direct effect of Extraversion on communication apprehension*	-6.637	2.906	-2.284	.023	-12.349	-.924
Creative Personality× Extraversion	.138	.121	1.141	.255	-.099	.376
$R^2 =.1395.; F (3. 420) =22.7011. p =.0000$						
Effect	β	SE	t	p	LLCI	ULCI
Constant ***	28.307	6.045	4.683	.000	16.426	40.189
Direct effect of Creative Personality on communication apprehension	.265	.278	.955	.340	-.281	.812
Direct effect of Emotional stability on communication apprehension	-.927	1.976	-.469	.639	-4.812	2.958

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Creative Personality× Emotional stability	.106	.083	1.281	.201	-.057	.269
	$R^2 =.1038; F (3. 420) =16.2085. p = .0000$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant *	20.615	9.541	2.161	.031	1.859	39.369
Direct effect of Creative Personality on communication apprehension**	1.277	.422	3.027	.003	.448	2.106
Direct effect of Openness to Experience on communication apprehension	.213	2.253	.095	.925	-4.215	4.642
Creative Personality× Openness to Experience	-.125	.099	-1.265	.207	-.319	.069
	$R^2 =.1350; F (3. 420) =21.8431, p =.0000$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant *	3.490	1.740	2.006	.046	.069	6.910
Direct effect of Creative Personality on test anxiety**	.204	.075	2.698	.007	.055	.352
Direct effect of Agreeableness on test anxiety+	.899	.518	1.737	.083	-.118	1.916
Creative Personality× Agreeableness+	-.038	.022	-1.727	.085	-.082	.005
	$R^2 =.0300; F (3.420) =4.3236, p =.005$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant	2.436	2.767	.880	.379	-3.003	7.875
Direct effect of Creative Personality on test anxiety+	.198	.118	1.671	.096	-.035	.431
Direct effect of Conscientiousness on test anxiety	.834	.597	1.398	.163	-.339	2.007
Creative Personality× Conscientiousness	-.024	.026	-.941	.347	-.075	.027
	$R^2 =.0346; F (3. 420)=5.0250. p =.002$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant ***	9.838	2.457	4.004	.000	5.008	14.668
Direct effect of Creative Personality on test anxiety	.015	.101	.149	.882	-.184	.214
Direct effect of Extraversion on test anxiety	-.934	.676	-1.382	.168	-2.263	.395
Creative Personality× Extraversion	.015	.028	.547	.585	-.040	.071
	$R^2 =.0522.; F (3. 420) =7.7167, p =.0000$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant ***	6.029	1.389	4.341	.000	3.299	8.759
Direct effect of Creative Personality on test anxiety	.051	.064	.804	.422	-.074	.177
Direct effect of Emotional stability on test anxiety	.344	.454	.758	.449	-.548	1.237
Creative Personality× Emotional stability	-.000	.019	-.017	.986	-.038	.037
	$R^2 =.0366; F(3. 420) =5.3161. p =.0013$					
Effect	**β**	SE	t	p	LLCI	ULCI
Constant **	6.209	2.185	2.842	.005	1.914	10.505
Direct effect of Creative Personality on test anxiety*	.197	.097	2.037	.042	.007	.387
Direct effect of Openness to Experience on test anxiety	-.037	.516	-.071	.944	-1.051	.978
Creative Personality× Openness to Experience	-.026	.023	-1.129	.259	-.070	.019
	$R^2 =.0761; F (3. 420) =11.5289. p =.0000$					
Effect	**β**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Constant **	18.697	7.107	2.631	.009	4.727	32.667
Direct effect of Creative Personality on fear of negative evaluation **	.804	.308	2.609	.009	.198	1.409

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Direct effect of Agreeableness on fear of negative evaluation	3.262	2.114	1.543	.124	-.893	7.417
Creative Personality× Agreeableness	-.105	.090	-1.160	.247	-.282	.073
	$R^2 =.0571$; F (3. 420) =8.4728, p =.0000					

Effect	β	SE	t	p	LLCI	ULCI
Constant [+]	20.229	11.379	1.778	.076	-2.139	42.597
Direct effect of Creative Personality on fear of negative evaluation[+]	.822	.487	1.688	.092	-.135	1.779
Direct effect of Conscientiousness on fear of negative evaluation	1.841	2.454	.750	.454	-2.983	6.665
Creative Personality× Conscientiousness	-.074	.107	-.693	.489	-.283	.136
	$R^2 =.0486$; F (3. 420)= 7.1475, p =.0000					

Effect	β	SE	t	p	LLCI	ULCI
Constant ***	52.089	10.036	5.190	.000	32.362	71.816
Direct effect of Creative Personality on fear of negative evaluation	-.184	.413	-.446	.656	-.995	.627
Direct effect of Extraversion on fear of negative evaluation*	-6.441	2.761	-2.333	.020	-11.867	-1.014
Creative Personality× Extraversion	0.178	0.115	1.550	0.122	-0.048	0.404
	$R^2 =.0788$; F(3. 420) =11.9838 , p =.0000					

Effect	β	SE	t	p	LLCI	ULCI
Constant ***	32.604	5.656	5.765	.000	21.487	43.720
Direct effect of Creative Personality on fear of negative evaluation	.085	.260	.327	.744	-.426	.596
Direct effect of Emotional stability on fear of negative evaluation	-.208	1.849	-.112	.911	-3.842	3.427
Creative Personality× Emotional stability	.082	.078	1.064	.288	-.069	.235
	$R^2 =.0692$; F(3. 420) =10.4122. p = .0000					

Effect	β	SE	t	p	LLCI	ULCI
Constant ***	33.845	8.985	3.767	.000	16.184	51.507
Direct effect of Creative Personality on fear of negative evaluation	.665	.397	1.674	.095	-.116	1.446
Direct effect of Openness to Experience on fear of negative evaluation	1.528	2.122	-.720	.472	-5.698	2.642
Creative Personality× Openness to Experience	-.034	.093	-.368	.713	-.218	.149
	$R^2 =.0899$; F (3. 420) =13.8300, p =.000					

Note. + p < .1. * p < .05. ** p < .01. *** p < .001

Annex B

Effect	β	SE	t	p
Constant				
Direct effect of Creative Personality on communication apprehension***				
Direct effect of Agreeableness on communication apprehension[+]				
Creative Personality× Agreeableness	2.11	2.26	.093	.043

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	$R^2 =.0951; F (3.420) =14.7134 . p =.0000$			
Effect	**β**	**SE**	**t**	**p**
Constant	14.983	12.120	1.236	.217
Direct effect of Creative Personality on communication apprehension+	.923	.519	1.779	.076
Direct effect of Conscientiousness on communication apprehension	1.621	2.614	.620	.536
Creative Personality× Conscientiousness	-.041	.114	-.363	.717
	$R^2 =.0903; F (3. 420)= 13.8956. p =.0000$			
Effect	**β**	**SE**	**t**	**p**
Constant ***	47.284	10.565	4.475	.000
Direct effect of Creative Personality on communication apprehension	.163	.434	.374	.708
Direct effect of Extraversion on communication apprehension*	-6.637	2.906	-2.284	.023
Creative Personality× Extraversion	.138	.121	1.141	.255
	$R^2 =.1395.; F (3. 420) =22.7011. p =.0000$			
Effect	**β**	**SE**	**t**	**p**
Constant ***	28.307	6.045	4.683	.000
Direct effect of Creative Personality on communication apprehension	.265	.278	.955	.340
Direct effect of Emotional stability on communication apprehension	-.927	1.976	-.469	.639
Creative Personality× Emotional stability	.106	.083	1.281	.201
	$R^2 =.1038; F (3. 420) =16.2085. p = .0000$			
Effect	**β**	**SE**	**t**	**p**
Constant *	20.615	9.541	2.161	.031
Direct effect of Creative Personality on communication apprehension**	1.277	.422	3.027	.003
Direct effect of Openness to Experience on communication apprehension	.213	2.253	.095	.925
Creative Personality× Openness to Experience	-.125	.099	-1.265	.207
	$R^2 =.1350; F (3. 420) =21.8431, p =.0000$			
Effect	**β**	**SE**	**t**	**p**
Constant *	3.490	1.740	2.006	.046
Direct effect of Creative Personality on test anxiety**	.204	.075	2.698	.007
Direct effect of Agreeableness on test anxiety+	.899	.518	1.737	.083
Creative Personality× Agreeableness+	-.038	.022	-1.727	.085
	$R^2 =.0300; F (3.420) =4.3236, p =.005$			
Effect	**β**	**SE**	**t**	**p**
Constant	2.436	2.767	.880	.379
Direct effect of Creative Personality on test anxiety+	.198	.118	1.671	.096
Direct effect of Conscientiousness on test anxiety	.834	.597	1.398	.163
Creative Personality× Conscientiousness	-.024	.026	-.941	.347
	$R^2 =.0346; F (3. 420)=5.0250. p =.002$			
Effect	**β**	**SE**	**t**	**p**
Constant ***	9.838	2.457	4.004	.000

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Effect	β	SE	t	p
Direct effect of Creative Personality on test anxiety	.015	.101	.149	.882
Direct effect of Extraversion on test anxiety	-.934	.676	-1.382	.168
Creative Personality× Extraversion	.015	.028	.547	.585
	R^2 =.0522.; F (3. 420) =7.7167, p =.0000			
Effect	**β**	**SE**	**t**	**p**
Constant ***	6.029	1.389	4.341	.000
Direct effect of Creative Personality on test anxiety	.051	.064	.804	.422
Direct effect of Emotional stability on test anxiety	.344	.454	.758	.449
Creative Personality× Emotional stability	-.000	.019	-.017	.986
	R^2 =.0366; F(3. 420) =5.3161. p = .0013			
Effect	**β**	**SE**	**t**	**p**
Constant **	6.209	2.185	2.842	.005
Direct effect of Creative Personality on test anxiety*	.197	.097	2.037	.042
Direct effect of Openness to Experience on test anxiety	-.037	.516	-.071	.944
Creative Personality× Openness to Experience	-.026	.023	-1.129	.259
	R^2 =.0761; F (3. 420) =11.5289. p =.0000			
Effect	**β**	**SE**	**t**	**p**
Constant **	18.697	7.107	2.631	.009
Direct effect of Creative Personality on fear of negative evaluation **	.804	.308	2.609	.009
Direct effect of Agreeableness on fear of negative evaluation	3.262	2.114	1.543	.124
Creative Personality× Agreeableness	-.105	.090	-1.160	.247
	R^2 =.0571; F (3.420) =8.4728, p =.0000			
Effect	**β**	**SE**	**t**	**p**
Constant +	20.229	11.379	1.778	.076
Direct effect of Creative Personality on fear of negative evaluation+	.822	.487	1.688	.092
Direct effect of Conscientiousness on fear of negative evaluation	1.841	2.454	.750	.454
Creative Personality× Conscientiousness	-.074	.107	-.693	.489
	R^2 =.0486; F (3. 420)= 7.1475, p =.0000			
Effect	**β**	**SE**	**t**	**p**
Constant ***	52.089	10.036	5.190	.000
Direct effect of Creative Personality on fear of negative evaluation	-.184	.413	-.446	.656
Direct effect of Extraversion on fear of negative evaluation*	-6.441	2.761	-2.333	.020
Creative Personality× Extraversion	0.178	0.115	1.550	0.122
	R^2 =.0788; F(3. 420) =11.9838 , p =.0000			
Effect	**β**	**SE**	**t**	**p**
Constant ***	32.604	5.656	5.765	.000
Direct effect of Creative Personality on fear of negative evaluation	.085	.260	.327	.744
Direct effect of Emotional stability on fear of negative evaluation	-.208	1.849	-.112	.911
Creative Personality× Emotional stability	.082	.078	1.064	.288

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Effect	$R^2 =.0692$; F(3. 420) =10.4122. p = .0000			
	β	SE	t	p
Constant ***	33.845	8.985	3.767	.000
Direct effect of Creative Personality on fear of negative evaluation	.665	.397	1.674	.095
Direct effect of Openness to Experience on fear of negative evaluation	1.528	2.122	-.720	.472
Creative Personality× Openness to Experience	-.034	.093	-.368	.713
	$R^2 =.0899$; F (3. 420) =13.8300, p =.000			

Note. + p < .1. * p < .05. ** p < .01. *** p < .001

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The Specifics of Higher Mental Functions in Children with a Leading Left Hand

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The article describes the study of higher mental functions in children of primary school age with a leading left hand. The materials of two empirical studies obtained on a sample of primary school students from two Moscow educational complexes are presented. The study no. 1 is longitudinal. It describes the dynamics of the formation of mental functions in left-handed children. The study no. 2 describes the specifics of spatial perception in left-handed children. The results of the study confirm the presence of the specifics of the development of mental functions in children with a leading left hand. Based on the results of the study, recommendations on working with left-handed children for specialists of the education system are proposed.

Keywords: neuropsychology; higher mental functions; spatial perception; primary school age; left-handed children.

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Специфика высших психических функций у детей с ведущей левой рукой

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Представлены материалы исследования высших психических функций у детей младшего школьного возраста с ведущей левой рукой. Целью исследования было выявление особенностей нейродинамических показателей, показателей памяти, внимания, мышления, пространственных функций и грамматических отношений леворуких младших школьников в сравнении с праворукими сверстниками. Показаны результаты двух эмпирических исследований, полученные на выборке учеников начальной школы из двух московских образовательных комплексов. Первое исследование являлось лонгитюдным и предполагало изучение динамики формирования психических функций у детей с ведущей левой рукой (приняло участие 70 детей младшего школьного возраста с ведущей левой рукой). Второе исследование было направлено на изучение специфики пространственного восприятия у леворуких детей (приняло участие 60 респондентов). Полученные данные подтверждают наличие специфики развития психических функций у детей с ведущей левой рукой. На основе результатов исследования предложены рекомендации для специалистов системы образования по работе с леворукими детьми.

Ключевые слова: нейропсихология; высшие психические функции; восприятие пространства; леворукость; младший школьный возраст.

Шалина О.С., Петухова Н.А., Романов Д.Б.
Специфика высших психических функций у детей с ведущей левой рукой
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Introduction

In recent decades, the number of left-handed children has been growing [3, 18, 20]. Left-handed children have mental characteristics that make it difficult to master subject and universal competencies, and complicate adaptation to the educational process, that has been proven during the research [4, 5, 8, 11, 12]. According to meta-analysis data, doctors and educators are increasingly faced with children impaired coordination and motor development, and this trend is parallel to an increase in the number of left-handed children in the population [17]. Methods for detecting deviations from the left-hemisphere profile of the organization of mental functions are also being improved [13], however, the question of the relationship of the profile of lateral organization with cognitive development remains debatable. There is no reliable data on the deficiency of a particular cognitive function in children with a right-hemisphere profile of lateral organization [19]. At the same time, both the practical observations of teachers and the data of modern meta-analysis indicate that children with a dominant left-hand experience difficulties in understanding texts and writing [16].

Modern educational programs focus on the left-sided profile of the lateral organization and involve the development of verbal and logical thinking and consistent information processing in the student [8]. In the case of left-handedness, the profile of the lateral organization is predominantly right-sided, and information processing occurs differently [22], which leads to difficulties in mastering the curriculum [7, 12, 15]. At the same time, a number of indicators of attention distribution, visual and spatial orientation turn out to be universal for left- and right-handed children, which indicates the high importance of cultural, in particular, educational and educational factors [14, 21].

A neuropsychological approach was used to investigate the nature of these dif-

ficulties. Neuropsychological diagnostics is an objective method of studying the structural features underlying higher mental functions [9]. The syndromic neuropsychological analysis assumes not so much a statement of the presence of a functional disorder, as its qualitative qualification, comparison of primary and secondary disorders, determination of the structure of the disorder [6]. With the help of neuropsychological diagnostics, it is possible to establish the features of the formation and course of mental processes in children with a leading left hand and further take into account the identified features for the personification of the educational process.

Organization of the Study

The study of the specifics of mental functions in left-handed children was conducted in two stages. At the first stage, left-handed primary school students were examined. A longitudinal method was used to track the dynamics of students over the year and a slice method to compare the characteristics of first-graders and fourth-graders. At the second stage, the features of spatial perception of left-handed and right-handed elementary school students were compared by the method of slices.

The first stage of the study

At the first stage of the study, 70 left-handed primary school students of School #2107 (Moscow) were examined (Table 1).

A comparative analysis of the results of students in the first grades (25 left-handed children) and fourth grades (24 left-handed children) was carried out separately. Left-handed fifth graders were also examined, who corresponded in age to fourth grade students (10 left-handed children). Of the total number of children, 31 students were examined twice — in October 2018 ("Group 1") and a year later, in September 2019 ("Group 2"). Thus, 101 observations were carried out during the examination of

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Table 1

Distribution of children by gender and age

Age	Gender		In total, age
	Boys	Girls	
7 years	6	7	13
8 years	9	3	12
9 years	12	9	21
10 years	6	9	15
11 years	6	3	9
In total, gender	**39**	**31**	**70**

70 children (66 of them were boys, 35 were girls. The class distribution is as follows:

Grade 1 — 25 observations (24.8%);

Grade 2 — 21 observations (20.8%);

Grade 3 — 21 observations (20.8%);

Grade 4 — 24 observations (23.8%);

Grade 5 — 10 observations (9.9%).

Neuropsychological techniques were used to assess the level of formation and features of mental functions [1]:

1. "Proof-reading test"

2. Memorizing two groups of three words

3. Making up a story based on a series of plot pictures

4. Exclusion of items

5. Copy with re-encryption

6. Head Samples

7. The Ozeretsky sample

8. Graphic test

9. A test for dynamic praxis

10. "Choice reaction" (conflict test)

11. Memorizing difficult-to-visualize shapes

12. A test for understanding logical and grammatical constructions [1, 2, 10, 13].

To interpret the data obtained, all indicators were reduced to complex parameters (Table 2). The indicators themselves and the principle of their assessment correspond to the standards and the general diagnostic logic of neuropsychological examination of younger schoolchildren aged 6—9 years [1]. The evaluation of particular indicators was carried out on scales similar to the Wasserman scale, where "0" indicates the absence of a disorder or dysfunction, and "3" indicates gross and/or multiple disorders and dysfunctions.

To study the significant results of the dynamics of indicators, the Pearson crite-

Table 2

Complex parameters of neuropsychological assessment and corresponding samples

Complex parameters	Diagnostically significant indicators of samples
The I structural and functional block of the brain	
Tonus	Symptoms of a tonus disorder in a graphic test for dynamic praxis
	Symptoms of impaired tone in a reciprocal coordination test
	Positional and tonus errors in the dynamic praxis test
	Observation data: various types of manual activities (writing, drawing, manipulation, etc.)
The pace of activity	The speed in the graphic test for dynamic practice

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Complex parameters	Diagnostically significant indicators of samples
	The speed in the reciprocal coordination test
	The time of the proofreading test
	Observation data: various types of manual activities (writing, drawing, manipulation, etc.) and problem solving
Fatigue	The number of errors at the initial, middle and final stages of the proof-reading test
	Observation data: work with tasks of varying duration and complexity
The II structural and functional block of the brain	
The volume of auditory-speech memory	Memorization of 2 groups of 3 words
The volume of visual-spatial memory	Memorization of difficult-to-visualize shapes
Resistance to interference	Memorization of 2 groups of 3 words
	Memorization of difficult-to-visualize shapes
Integrative* indicator of left-hemisphere functions	Memorization of 2 groups of 3 words
	Memorization of difficult-to-visualize shapes
Integrative* indicator of right hemisphere functions	Memorization of 2 groups of 3 words
	Memorization of difficult-to-visualize shapes
Perception of spatial Relations	The Head's Test
	Copying with 180 degree rotation
Understanding logical and grammatical constructions	A test for understanding logical and grammatical constructions
The III structural and functional block of the brain	
Assimilation of instructions	Conflict test
	The Head's Test
	Copying with 180 degree rotation
Level of verbal and logical thinking	The fourth-is-undue test
Level of visual and imaginative thinking	Telling a story based on a series of plot images
Integrative* indicator of left-hemisphere functions	Telling a story based on a series of plot images
	Copying with 180 degree rotation
Integrative* indicator of right hemisphere functions	Telling a story based on a series of plot images
	Copying with 180 degree rotation
Serial organization of movements	A test for dynamic praxis
	A test for reciprocal coordination
	A graphic test for dynamic praxis

*Remark: based on the results of calculating the characteristic "left-hemisphere" and "right-hemisphere" errors when performing a number of tests (according to [1]).

rion $\chi 2$ for nominative scales and the Wilcoxon criterion for quantitative and ordinal scales were used. More successful performance of the majority of samples during repeated diagnosis was noted (after a year, in Group 2).

The pace of activity. In both groups, the pace of activity is rather slow. In Group-1, at the trend level, there is a more pronounced tendency to slow down relative to Group-2 ($\chi2(2)=5.596$, p=0.061).

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Fatigue. Fatigue in the process of completing tasks in Group 1 and Group 2 is poorly expressed, signs of fatigue are not observed in 58% of the subjects, without significant differences in groups. However, when comparing the groups "1st grade" and "4th grade", there is a more pronounced fatigue of first-graders ($\chi2(2)=11.618$, $p=0.003$); by the end of primary school, children mostly do not show high fatigue.

Indicators of impulsivity and fatigue were expressed in both groups without significant differences. At the same time, fatigue is mostly average, and impulsivity is noted in the majority of the sample (71%), unchanged over time.

The volume of auditory-speech memory. Significant differences between the results of the first ($W(31)=89.5$, $p=0.016$) and delayed ($W(31)=75.5$, $p=0.002$) reproductions were revealed between the groups. Group 2 demonstrates more successful completion of the task than Group 1. In this case, we can talk about a larger volume of auditory-speech memory in the subjects of Group-2 relative to the subjects of Group-1. A comparison of first-graders with fourth-graders gives a similar result: older children have a large amount of auditory-speech memory ($U(49)=194$, $p=0.032$).

The volume of visual-spatial memory. Indicators of visual-spatial memory also differ significantly: Group-2 has a more productive task performance relative to Group-1: the third ($W(31)=86.5$, $p=0.027$) and delayed ($W(31)=83$, $p=0.019$) playback improved. A comparison of first-graders with fourth-graders gives a similar result: older children have a large amount of visual-spatial memory ($U(49)=184$, $p=0.03$). Probably, this dynamic is associated with the improvement of visual-spatial representations and the development of the mnestic sphere.

Resistance to interference. Group 2 showed significantly higher resistance to interference ($\chi2(2)=9.207$, $p=0.010$) when memorizing stimuli of various modalities — auditory and visual-spatial. Accordingly, the "4th class" also demonstrates significantly higher interference compared to the "1st class" group ($\chi2(2)=15.312$, $p<0.001$)

An integrative indicator of left-hemisphere functions. In Group 1, there is a greater number of errors ($W(31)=82.5$, $p=0.010$) characteristic of weak left hemisphere functions. Such errors include distortions and substitutions of words when memorizing them, simplification or "improvement" of shapes, omission of details when copying complex shapes. In Group 1, "left-hemisphere" errors were not found in only 3% of the subjects, in Group 2, this type of error was not found in 19% of the subjects.

An integrative indicator of right hemisphere functions. The subjects of both groups are prone to "right-hemisphere" errors without significant group differences. This manifests itself in a violation of the word order in the study of auditory-speech memory and in a violation of proportions, the division of the figure into parts and dysmetry in the study of visual-spatial memory.

Perception of spatial relations. In Group 2, the perception of spatial relations is more formed, which is expressed in significantly more productive performance of tests for visual-spatial orientation ($\chi2(2)=6.035$, $p=0.049$). The "mirroring" of the samples is observed in 87% of all subjects, regardless of the group: it occurs in Head samples, in a sample for copying an image with re-encoding and when reproducing stimuli in samples for visual-spatial memory. A comparison of first-graders with fourth-graders gives a similar result: older children cope with tasks with significantly higher productivity ($\chi2(2)=10.598$, $p=0.005$).

Understanding logical and grammatical constructions. There are no significant differences between Group-1 and Group-2 in the understanding of logical and grammatical constructions. However, the Group-1 subjects admit a greater number of errors in understanding prepositions in logical and

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grammatical constructions (W(31)=81.5, p=0.009) and a smaller number of errors in "reversibility tests" (W(31)=96.5, p=0.043). Fourth graders make significantly fewer mistakes in understanding logical and grammatical constructions (U(49)=178, p=0.014).

Learning the instructions. Subjects of both groups mostly need to be re-presented with instructions; no significant differences were found. At the same time, if children have practically no difficulties in learning instructions in grade 4, then in grade 1 a significantly larger number of students need help and repeat tasks (χ2(2)=6,870, p=0.032).

The level of verbal and logical thinking. Almost all children show high results in the test for the study of verbal and logical thinking, which indicates that this type of thinking is sufficiently formed in left-handed students, regardless of age.

The level of visual and imaginative thinking. There is a difference in the level of tendency in the formation of visual-imaginative thinking (χ2(3)=7,728, p=0.052): the subjects of Group 2 demonstrate slightly more successful completion of the tests.

An integrative indicator of left-hemisphere functions. Many children have omissions of semantic links in the process of building a story, there are no significant differences between the groups. Only 18% of the total number of subjects do not make "left-hemisphere" mistakes when composing a story and copying an image with re-encoding.

An integrative indicator of right hemisphere functions. 87% of all subjects have "right-hemisphere" errors, consisting in a violation of the connection between events or an unrealistic interpretation of events in the construction of the story and topological errors and asymmetries when copying an image with 180-degree reencryption. There are no significant differences between the groups.

Serial organization of movements. There are no significant differences between the groups, only 8% of the total

number of subjects perform all the tests according to the standard. Most children simplify execution relative to the sample, automation of execution occurs mainly after several failures. Children from Group 2 make significantly fewer spatial and kinesthetic errors (W(31)=90,5, p=0,017).

Since visual-spatial perception and quasi-spatial relations underlie the educational process in the lower grades, largely determine the success of mastering the grammatical structure of speech and counting functions, the focus of attention was shifted to a comparative study of these indicators in groups of right-handed and left-handed schoolchildren.

The second stage of the study

At the second stage, a study was conducted on the specifics of the formation of the second structural and functional block of the brain in left-handed children — visual-spatial and quasi-spatial factors. The results of neuropsychological tests performed by left-handed and right-handed children were compared.

60 primary school students were examined (school #2107 and The Pokrovsky Quarter School, Moscow). Of these, 26 were left-handed (experimental group, EG) and 34 were right-handed (control group, CG) (Table 3).

Neuropsychological techniques were used, the results of which revealed a number of complex parameters (Table 4):

1. Graphical sample
2. The praxis of the finger pose
3. Copying the table and cube
4. Understanding logical and grammatical constructions [1, 2, 10, 13]

Statistical processing was carried out in Excel and SPSS programs using the Mann-Whitney U-test. This criterion was chosen as a nonparametric method for comparing two independent samples.

An indicator of visual-spatial functions. There are no significant differences between the groups. However, left-handed

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Table 3

Distribution of children by gender and dominant hand

Dominant hand	Gender		In total, dominant hand
	Boys	Girls	
Experimental group (EG)	17	9	26
Control group (CG)	16	18	34
In total, gender	33	27	60

Table 4

Complex parameters of neuropsychological assessment and corresponding samples

Parameter	Sample	Tests
Indicator of visual-spatial functions	Metric errors, perspective errors Errors in the three-dimensional image Spatial errors Non-compliance with the line	Copying the table and cube Finger pose praxis The graphic test for dynamic praxis
Quasi-spatial factor	Productivity of understanding passive, active, prepositional constructions	Understanding of logical and grammatical constructions

children are more likely to make three-dimensional image errors and draw the table flat (U(60)=514, p=0.021).

The quasi-spatial factor. Significant differences between the groups were revealed (U(60)=424, p=0.002). In left-handed children, the quasi-spatial factor is less formed than in right-handed children. At the same time, left-handed people have a weaker understanding of passive constructions (U(60)=512, p=0.02). No significant differences were found in the groups in understanding prepositional constructions and cases, and differences in understanding active constructions were revealed at the trend level — right-handed children coped with tasks more successfully (U(78)=556, p=0.054).

Discussion

According to the data obtained, left-handed children have certain features of mental functions.

Left-handed children have been found to be exhausted and hyperactive, which can affect the course of all mental processes and manifest itself in increased fatigue, absent-mindedness, difficulties concentrating on lessons. By the end of high school, left—handed children's neurodynamic indicators improve — their tone stabilizes, impulsivity decreases, and the pace of activity levels out.

The dynamics of the development of the second functional block of the brain, responsible for receiving, storing and processing information, is expressed to a greater extent. The productivity of memorizing stimuli of different modalities increases, both auditory and visual-spatial. The resistance to interference in older children is higher, and the volume of delayed reproduction is increasing.

The rate of development of auditory-speech memory exceeds the rate of visual-spatial memory, which allows us to judge the active development of the left hemisphere. Metric errors and perspective errors, non-compliance with the line and incomplete three-dimensional image are observed in left-handed children more often than right-handed peers, which may indicate a weakness of visual and spatial functions. With the improvement of neuro-dynamics, there is no improvement in spa-

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tial gnosis, which indicates the importance of timely correction of spatial perception of left-handed children, even with their high compensatory capabilities.

With age, the assimilation of the grammatical structure occurs, and quasi-spatial errors in the perception of logical and grammatical speech structures are less common. At the same time, difficulties appear in understanding reversible structures, which, according to T.V. Akhutina [1], can occur with a lag in the development of one of the hemispheres. Presumably, this is due to the compensatory development of the left hemisphere, due to which the right hemisphere can slow down the pace of its development. This may be associated with an increase in "right—hemisphere" errors in older children — fourth grade students.

The development of the third block of the brain is characterized primarily by an increasing level of instruction assimilation in accordance with age — 1st grade students more often need to re-present instructions or simplified formulation of task conditions. Starting in the second grade, children are able to learn instructions more successfully and "slow down" their immediate reactions.

Conclusion

Thus, the dynamics of higher mental functions in left-handed children is uneven: the active development of auditory-speech memory and the functions of the third structural and functional block of the brain comes to the fore.

Despite the peculiarities of higher mental functions in left-handed children, with timely correction, it is possible to achieve effective compensation for concomitant learning difficulties associated with atypical development of mental processes. Given the possible difficulties associated with the weakness of the neurodynamic component, it is possible to achieve significant results and minimize difficulties in the learning process.

Based on the survey data, the main recommendations for primary school teachers are proposed:

1. Take into account the possible weakness of neurodynamic parameters and regulatory functions. Left-handed children often need more time to analyze incoming information. Therefore, you need to repeat the upcoming tasks several times, ask if the task is clear, and repeat the instructions if necessary. It is better to give instructions in simple words and divide it into several stages.

2. It is better to present the material for assimilation and memorization not only by ear, but also to actively use the stimuli of other modalities. For example, to correct the mirrored spelling of letters, you can place the alphabet on the student's desk to create support for visual images of letters.

3. To correct difficulties in understanding texts when reading, special attention should be paid to prepositions and conjunctions (use didactic tools and methodological techniques that allow schematizing the relationship between the members of sentences — to place events on a timeline, visualize spatial relationships, etc.), active and significantly rarer passive constructions (semantic analysis of text, "shifter" games, during which children can visualize direct and reverse actions or imagine what the situation would look like if the subject and object of action "swap" places, for example).

4. In the first grades, together with a teacher-psychologist or in the form of extracurricular activities, conduct a cycle of adaptation classes for left-handed children (in the format of additional extracurricular activities or thematic training cycles) aimed at developing arbitrariness, inhibition processes, improving spatial perception and quasi-spatial gnosis. Such classes, unlike academic school lessons, should be as active as possible, involve all sensory systems and rely on the principle of learning in motion, through bodily sensations and experience.

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Impact of Training Prevention Program on Bullying and Prejudice Among Adolescents Toward Ending Bullying Behavior: A Randomized Experimental Study

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It is crucial that every child feels safe and protected from bullying and prejudice. Such behavior can have serious negative effects on adolescents, which is why effective intervention strategies are necessary. This study examines the impact of a prevention program on reducing bullying and prejudice among middle-level students in 103 governmental schools in Jeddah, Saudi Arabia. Using a randomized experimental design, 155 students were assigned to an experimental or control group. The study utilized assessment tools such as demographic information, the Bullying Amongst Diverse Populations (BADP) evaluation scale, and the Basic Empathy Scale (BES). The results revealed significant improvements in knowledge, attitudes, affective and cognitive domains, and total empathy among the experimental group compared to the control (mean difference=8,3, p<0,05; mean difference=7,2, p<0,05; mean difference=9,6, p<0,05; mean dif-

ference=13,7, p<0,05 respectively). However, no significant differences were seen in witness communication skills and bullying intervention ability. This study highlights the effectiveness of interventions in mitigating bullying and prejudice, emphasizing the need for comprehensive training programs in schools. Therefore, we highly recommend implementing "No Bullying and Prejudice" policies and legislative measures to safeguard the well-being of children.

Keywords: bullying; adolescent behavior; anti-bullying program; prejudice reduction; randomized experimental study.

Влияние тренинговой профилактической программы для подростков на снижение буллинга: рандомизированное экспериментальное исследование

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Важно, чтобы каждый ребенок чувствовал себя в безопасности и был защищен от буллинга и предрассудков, которые могут иметь серьезные негативные последствия для подростков, поэтому необходимы эффективные стратегии вмешательства. В данном исследовании изучается влияние профилактической программы, направленной на снижение буллинга и предрассудков среди учащихся среднего звена в 103 государственных школах Джидды, Саудовская Аравия. 155 учащихся были рандомно распределены в экспериментальную или контрольную группы. В исследовании использовались такие инструменты оценки, как демографическая информация, оценочная шкала Bullying Among Diverse Populations (BADP) и шкала базовой эмпатии (BES). Результаты показали значительное улучшение знаний, отношения, показателей аффективной и когнитивной сфер, а также общей эмпатии в экспериментальной группе по сравнению с контрольной (средняя разница=8,3, p<0,05; средняя разница=7,2, p<0,05; средняя разница=9,6, p<0,05; средняя разница=13,7, p<0,05 соответственно). Однако не было отмечено значительных различий в навыках общения со свидетелями и умении вмешиваться в ситуацию буллинга. Данное исследование подчеркивает эффективность вмешательства, отмечая необходимость комплексных обучающих программ в школах. Поэтому мы настоятельно рекомендуем внедрять политику «Нет издевательствам и предрассудкам» и законодательные меры для обеспечения благополучия детей.

Ключевые слова: буллинг; поведение подростков; программа борьбы с буллингом; снижение предубеждений; рандомизированное экспериментальное исследование.

Introduction

Every child deserves to grow up in a safe environment, free from the pervasive threat of bullying and prejudice [2]. The prevalence and detrimental impact of bullying among children and adolescents necessitate serious attention

and comprehensive action [4]. To combat this pervasive issue effectively, it is imperative to develop interventions that address the diverse forms of bullying, including physical, verbal, social, and cyberbullying [5]. Additionally, these interventions should be firmly grounded in established theoretical frameworks to provide a clear understanding of their underlying mechanisms and unique contributions to the field [6]. Despite significant progress in research and intervention efforts, a critical examination of existing literature reveals the need for interventions that go beyond conventional approaches. This study aims to contribute to the existing body of knowledge by presenting a novel bullying and prejudice intervention that offers a distinctive theoretical rationale and differentiation from previously published interventions [18].

At the core of our intervention lies a robust theoretical foundation based on prominent theories related to bullying and prejudice [29]. Drawing from the social learning theory, social cognitive theory, and the social-ecological model, our intervention seeks to address bullying as a complex interplay of individual, social, and environmental factors [29]. By incorporating these theories, we aim to develop targeted strategies that not only address the immediate bullying behaviors but also consider the broader social context that perpetuates and sustains such actions [43].

The intervention that will be used in the current study stands apart from prior efforts due to its incorporation of innovative and tailored components [45]. Through extensive research and analysis, specific strategies that directly target the diverse forms of bullying prevalent among schoolchildren have been identified [46]. The intervention encompasses a comprehensive approach that includes individual-level skill-building, fostering social support networks, and promoting positive school environments [47].

In contrast to earlier interventions, which may have focused primarily on certain types of bullying or specific age groups, our intervention seeks to comprehensively address the varying needs of diverse populations [18]. By conducting a thorough comparative analysis with previously published interventions, we highlight the distinctive attributes that position our approach

as a pioneering effort in the field [27]. This study strives to advance our understanding of how to effectively reduce bullying and prejudice by examining the intervention's theoretical underpinnings and unique components [44]. By explicitly elucidating the rationale behind our strategies, we aim to shed light on the underlying mechanisms that drive behavioral change and ultimately contribute to lasting positive outcomes [25]. Through the identification of limitations in previous interventions and empirical research, we recognized a significant research gap that inspired the development of our intervention [18]. With a focus on empowering schoolchildren to become active defenders against bullying and prejudice, we seek to address the dearth of comprehensive interventions targeting multiple forms of bullying and diverse populations [31].

We acknowledge potential challenges and constraints in implementing our intervention [14]. By transparently discussing these limitations, the study aims to foster a deeper understanding of the complexities associated with anti-bullying efforts and provide valuable insights for future research and development [13].

Embarking on this pioneering study, our motivation is rooted in the belief that our innovative intervention targeting bullying and prejudice will offer a valuable addition to the field [11]. By grounding our strategies in well-established theories, differentiating our approach from existing interventions, and addressing the specific needs of diverse populations, we are confident that our research will help advance the collective efforts to create safe and inclusive environments for all children and adolescents [39]. Therefore, the study looked at an exploration of participants' perceptions towards both behaviors involved in assessing their feelings about bullying behavior, as well as their concerns regarding prejudice. Additionally, the study aimed to identify the participants' subjective emotions concerning these behaviors.

Significance of the study

This study explores the effectiveness of a prevention program on bullying and prejudice among adolescents. It is significant as the findings can contribute to evidence-based strategies for ending bullying behavior. Educators,

policymakers, and practitioners should take note of the study's insights to reduce instances of bullying and promote positive social relationships among adolescents. Bullying has severe consequences, so understanding the impact of prevention programs is crucial. The study can help develop programs that effectively target underlying behaviors and attitudes.

Moreover, the study reveals the link between bullying and prejudice, emphasizing the need for prevention programs to tackle biases and promote tolerance. This can create a more inclusive society. The study has significant implications for designing effective interventions and strategies to combat bullying and create safer environments for adolescents.

Theoretical and conceptual framework of the study

Our bullying prevention program is based on a combination of several theoretical frameworks, including Bandura's Social Learning Theory [9], Social Cognitive Theory [10], and the Social-Ecological Model [5]. The program aims to empower teenagers and reduce bullying behavior and prejudice by addressing cognitive functions, intergroup communication techniques, systems of ecology, and positive youth development [33]. The conceptual model integrates these theories, utilizing a feedback loop to examine the effects of the program on mediating variables, such as cognitive processes, intergroup relations, and ecological influences, offering a comprehensive understanding of the dynamics among adolescents.

Definition of study variables:

1. "Bullying is the deliberate misuse of power through repeated harmful behavior, affecting individuals or groups who feel powerless to stop it [12].

2. Discrimination is unfair treatment based on characteristics like race, gender, age, or sexual orientation [24].

3. Attitude refers to enduring beliefs and feelings towards social objects, while knowledge is information gained through experience [7; 28].

4. An educational program is a structured set of activities to achieve learning goals [38].

Prejudice is forming opinions about others based on group membership, such as ethnicity, gender, or religion [35].

Aim of the study:

The primary objective of the present study was to examine the effects of a training prevention program in reducing incidents of bullying and prejudice among adolescents attending 103 schools in Jeddah, Saudi Arabia.

Specific objectives:

1. Evaluate the students' knowledge and attitudes regarding bullying and prejudice behavior before and after the implementation of the intervention program in both the experimental and control groups.

2. Investigate the relationship between knowledge and attitudes towards bullying and prejudiced behavior in both groups.

3. Compare the experimental and control groups in terms of their knowledge, attitudes, empathy, and their willingness to intervene in instances of bullying and prejudice before and after the intervention program.

4. Examine the potential associations between students' demographic backgrounds and their knowledge and attitudes towards bullying and prejudiced behavior, both before and after the training program.

This study seeks to answe the following research questions:

Research Question 1 (RQ 1): What was the effect of the prevention training program on the knowledge of adolescent students before and after the training intervention?

Research Question 2 (RQ 2): What was the impact of the prevention training program on prejudicial attitudes and skills related to bullying behavior before and after the educational training?

Research Question 3 (RQ 3): How did the demographic characteristics of the participants influence the effects of the pre-post educational training on bullying behavior prevention?

Materials and methods
Study area/setting and subjects:

A girls' school in Jeddah, Saudi Arabia was selected for a study on bullying and prejudice.

The school, known as School 103, has 18 classes with an average of 19-22 students in each class. Jeddah's diverse population adds complexity to social interactions, and the city's educational landscape plays a crucial role in shaping students' experiences. Understanding the local context is crucial for effective intervention against bullying and prejudice.

Study design:

A randomized experimental study design was employed to investigate the hypothesis concerning the knowledge and attitudes of middle-level education adolescents in reducing bullying and prejudice behaviors among them. This research design was considered suitable for establishing a cause-effect relationship because it allowed the researchers to actively ensure that the two groups of participants were equivalent in terms of their characteristics and other potential confounding factors.

Sample size and sampling technique

A power analysis was conducted to validate the sample size of 180 students, ensuring statistical power for detecting effects. By inputting our chosen significance level (α) set at 0,05, power ($1-\beta$), and an estimated effect size into the calculator, we were able to determine the minimum sample size necessary to achieve our research objectives. This calculation served as a crucial step in validating the robustness of our research design, reinforcing our commitment to conducting a study that is both methodologically sound and capable of producing meaningful and statistically significant findings.

A purposive convenient sampling technique was used to select middle-level education students from a school in Jeddah, Saudi Arabia. The sample included 60 students from grades 7, 8, and 9 each, with random assignment into control and intervention groups. Approval from students, parents, and the school principal was obtained to ensure ethical participation. Transparent permissions and collaborative efforts emphasized methodological and ethical integrity in the research.

Data collection instrument:

The tools of the current study consist of 3 main tools as the following:

1. **The demographic characteristics**: The research segment pertaining to demographic characteristics obtained data on participants' age, academic standing, country of origin, parental education level, place of residence, family's socioeconomic status, family size, and sibling birth order. Additionally, it investigated their engagement in anti-bullying initiatives and their encounters with bullying or prejudice, with the objective of exploring the influence of demographics on these matters. This analysis contributes to the enrichment of the study's results.

2. **Bullying amongst diverse populations (badp) evaluation scale**. The bullying and Prejudice Assessment Questionnaire, known as BADP, was originally developed by [21]. The BADP questionnaire consists of six subscales that assess knowledge of prejudice and bullying. These subscales include knowledge, skills, efficacy, likelihood of intervention, perceived participant role, and frequency of encounters and intervention in bullying and prejudice situations. The participants rated their responses on a 7-point Likert scale, ranging from 1 (not at all) to 7 (extremely high), to evaluate their knowledge, abilities, feelings, attitudes, and the likelihood of intervention. The frequency of experiences and interventions in bullying and discrimination situations were also rated on a 7-point Likert scale, ranging from 0 (never or very rarely) to 5 (4-7 times a week). Sample questions from the BADP included assessing the participants' understanding of bullying, various forms of bullying, and different approaches to dealing with bullying. The participants were also asked to rate the frequency of their encounters with specific bullying behaviors, such as physical harm or the use of derogatory language.

According to Ishiyama's study, Cronbach's alpha for each measure in the BADP were as follows: Knowledge (0,73), Skills (0,74), Efficacy (0,66), and Intervene (0,66). These scores indicate the reliability of the measures in assessing the relevant constructs.

3. **Basic empathy scale.** The Basic Empathy Scale (BES), developed by [22], was employed in the current study. The purpose of the BES is to gauge both cognitive and affective empathy, evaluating individuals' capacity to

understand and share the emotions of others. This measurement tool comprises 20 statements, which participants rate on a 5-point Likert scale spanning from 1 (strongly disagree) to 5 (strongly agree). The BES is comprised of two subcategories: Affective Empathy and Cognitive Empathy. To determine the overall BES score, the scores from these two subcategories are combined. The Cronbach's alpha values for the cognitive and affective subscales of the BES were found to be $\alpha=0,79$ and $\alpha=$(value missing from the provided information), respectively, indicating good internal consistency reliability. The scale also demonstrated significant factorial validity and reliability [31]. The BES was administered to participants both before and after the treatment, as well as to the control group.

Validity and reliability

The BADP evaluation scale and BES survey were selected to assess changes in knowledge, attitudes, behaviors, and empathy levels before and after the intervention. These tools have been proven to be valid and reliable in measuring the relevant constructs. The BADP scale by Ishiyama [29] covers various aspects including knowledge, skills, efficacy, intervention likelihood, participant role perception, and frequency of encounters related to bullying and prejudice. It exhibits acceptable internal consistency and reliability, making it suitable for this study. Similarly, the BES by [22] evaluates cognitive and affective empathy with good internal consistency reliability and factorial validity.

Furthermore, these measurement instruments underwent a meticulous process of translation, back-translation, and pilot testing in Arabic to ensure cultural appropriateness and linguistic clarity for the target audience. The pilot study indicated high internal consistency reliability scores as measured by Cronbach's Alpha, was reported at 83,5 for knowledge, 83,7 for skills, 87,8 for efficacy, 84,8 for intervention, and 70,8 for empathy scales., further authenticating the Arabic version of the questionnaire for evaluating knowledge, attitudes, and behaviors concerning bullying and prejudice among adolescents.

In summary, these chosen tools provide a strong foundation for assessing the effectiveness of the prevention program due to their comprehensive nature, validity, reliability, cultural sensitivity, and ability to track changes over time.

Data collection procedure:

The data collection process was initiated subsequent to obtaining official approvals from CONJ, KAIMRC, and IRB. Students in grades 7, 8, and 9 were invited to participate following consent from themselves, their parents, and the school principal. A total of 180 students were evenly distributed into control and intervention groups through random assignment utilizing a random number table.

Each student was allocated a unique code for identification purposes during group allocation. The researchers conducted training sessions focusing on the identification, prevention, and intervention of bullying incidents, as well as addressing biases. These sessions included the use of PowerPoint presentations and handouts, with precautions taken to minimize researcher bias.

Subsequent to the training, evaluations were conducted and collected by a different team member to reduce bias. The training program spanned six hours over two sessions, covering various aspects of bullying and prejudice prevention. To accommodate logistical constraints, students were divided into morning and afternoon sessions, with the researchers ensuring comprehensive instruction during both periods.

All students convened for theoretical discussions, while clinical training took place in smaller subgroups to provide personalized attention. Despite facing logistical challenges, the methodology effectively met the students' schedules, offering an inclusive and impactful learning experience for all participants.

Prevention Program

The prevention initiative, known as 'Building Bridges', presents a range of components designed to tackle bullying and prejudice among adolescents effectively:

1. Educational Workshops: These workshops provide a thorough grasp of bullying and prejudice through multimedia presentations, discussions, and real-life scenarios. Participants gain insights into various manifestations of bul-

lying and prejudices, thereby increasing their awareness and empathy.

2. Empathy and Emotional Intelligence Training: Tailored modules are utilized to nurture empathy and emotional intelligence through role-playing activities and guided discussions, fostering compassion and understanding among the participants.

3. Enhancing Assertiveness and Conflict Resolution Skills: The training in conflict resolution equips participants with the tools to respond assertively in bullying situations while upholding respect for others. Through role-playing exercises and debriefing sessions, individuals can practice assertive responses and conflict-resolution techniques.

4. Practical Exercises:

— Practicing "I-Statements": Participants are taught how to express feelings and needs assertively.

— Active Listening Drills: Participants engage in pair exercises to enhance active listening skills.

— Role-playing Conflict Resolution Scenarios: Simulated conflicts guide participants through steps toward resolution.

— Assertive Communication Practices: Analyzing assertive versus aggressive behaviors in simulated videos helps participants refine their communication skills.

5. Fostering Inclusivity and Appreciation for Diversity: Activities are structured to promote understanding and appreciation for diversity, creating an inclusive environment that values each individual's contributions.

6. Establishing Safe Environments: Special focus is given to creating secure spaces within schools where participants can openly discuss their experiences and seek assistance from trained facilitators or counselors.

7. Peer Support and Defenders Training: Participants receive training on intervening safely in bullying incidents to support victims, reinforcing positive behaviors within peer groups.

8. Engaging Families and Communities: Teachers collaborate with parents and caregivers to extend program principles beyond school hours. Community events aim at fostering collaboration in eradicating bullying and prejudice.

In essence, 'Building Bridges' provides a comprehensive strategy for preventing bullying and prejudice by integrating education, skill enhancement, inclusivity promotion, as well as community engagement efforts.

Control group:

In contrast, the control group refrained from engaging in the preventive training program. Their participation was confined to the completion of pre-test and post-test questionnaires exclusively.

Data management and analysis plan:

The collected data were coded and analyzed using the latest version of the statistical software SPSS. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated to summarize the data. Independent sample t-tests were performed to compare the item means of knowledge evaluation between the experimental group and the control group. Additionally, paired t-tests were conducted to analyze the changes in total knowledge, attitudes, empathy, and practice role scores within the participants' responses from the pre-test to the post-test. Statistical tests appropriate for assessing the association between the participants' sociodemographic variables and the study variables were employed, with a significance level set at $p<0,05$.

Ethical considerations:

The study underwent a formal approval process, beginning with submission to the research unit at the College of Nursing, Jeddah, KAIMRC, and IRB (NO. SP22J/065/06). After receiving approval, the study was then submitted to the Ministry of Education for further approval. Once the necessary approvals were obtained, the principal of the 103 schools was approached to seek approval from the parents of the students. The study subjects were then informed about the study's purpose and procedure. They were assured that their participation was voluntary and that they had the right to withdraw from the study at any time without facing any penalties. It was emphasized that their responses would remain anonymous and their data would be kept confidential within the records and office of NGHA.

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Results

Table 1 The participant demographics of the study revealed no significant differences between the Experimental and Control groups in terms of age, nationality, and family size. However, a significant difference was found in the distribution of average income and participants attending workshops within the school. It is worth noting that more than half of the participants in both groups attended workshops overall, with no significant differences between the two groups.

Table 2 Outlined the distribution of participants based on their encounters with bullying and prejudice. Within the Experimental group, 68,2% reported instances of bullying from classmates, while in the Control group, 60,6% indicated being bullied by 59,5% of their peers. Although there was no statistically significant variance in overall exposure to bullying between the two groups, notable differences were evident in specific instances of bullying.

Significant variances emerged between the Experimental and Control groups concerning item no. 2, which pertains to physical actions such as kicking or pushing others, and item no. 4, which encompasses racial slurs or stereotypes directed at individuals, with p-values of 0,010 and 0,021, respectively. However, no significant distinctions were noted between the groups for other aspects related to experiences of bullying. In terms of participants' engagement in bullying behaviors, no significant differences were detected between the Experimental and Control groups.

Figure 2 demonstrated the comparison of roles perception in the pre- and post-assessment between the Experimental and Control groups. In the Experimental group, prior to intervention, percentages were as follows: 2,4% identified as bullies, 29,8% as victims, 28,2% as defenders, and 42,9% as witnesses. Following the intervention, these figures notably shifted to 0,0% as bullies, 7,1% as victims, 61,9% as defenders, and 31% as witnesses.

On the other hand, the Control group exhibited pre-assessment percentages of: 11,3% as bullies, 26,8% as victims, 33,8% as defenders, and 28,2% as witnesses. Post-assessment results indicated a change to 2,8% identified as

bullies, 4,2% as victims, 28,2% as defenders, and a significant increase to 64,8% assuming the witness role.

Both groups experienced a transformation in their perception of roles post-intervention with a reduction in negative roles (bullies and victims) and an elevation in positive roles (defenders and witnesses). Notably, the Experimental group demonstrated a more substantial increase in defenders and a decrease in victims compared to the Control group which showed a higher proportion of participants transitioning into the witness role during post-assessment analysis.

Table 3 shows the comparison between the experimental group (N=84) and the control group (N=71) in various domains including knowledge, communication skills, attitudes, ability to intervene, and empathy was detailed in the table both before and after the intervention. Both groups demonstrated significant enhancements across all domains post-intervention with highly significant p-values (P<0,001) indicating improvements in total knowledge score, communication skills, attitudes, ability to intervene, and empathy.

Large to medium effect sizes (r) ranging from –0,563 to –0,854 for the experimental group and from -0,017 to –0,802 for the control group underscored the substantial impact of the intervention on these domains. The control group generally displayed lower post-intervention scores compared to the experimental group in all areas, signaling the effectiveness of the intervention.

Notably, while the control group exhibited noteworthy improvements in total empathy, particularly in affective emotional empathy and cognitive emotional empathy, the effect sizes were relatively smaller than those of the experimental group. Overall, these results suggest that participants' knowledge, communication skills, attitudes, ability to intervene, and empathy were effectively enhanced by the intervention, with greater improvements observed in the experimental group over the control group.

Table 4 compares the abilities of participants in an experimental and control group (N=155) to perceive their role in addressing bullying behavior and prejudice, both in the past and presently. Results indicate significant improvements

in perception within both groups from the past to the present, with mean scores increasing in both experimental (from 2,9048 to 3,5476) and control (from 2,7887 to 3,5493) groups. Paired t-tests confirm the statistical significance of these improvements (p<0,001), with t-values of -6,028 for both groups. These findings suggest that the intervention in the experimental group, alongside potential external factors, has positively influenced participants' abilities to perceive their role in addressing bullying and prejudice.

Table 5 displayed a significant disparity emerged in knowledge levels based on the level of study (χ^2=10,093, p=0,006*), notably with participants in Level 7 exhibiting higher inadequate knowledge in the experimental group. However, other factors such as nationality, age, family size, and income do not show significant differences. The data suggests that certain demographic characteristics may influence knowledge levels differently depending on the group and the specific characteristic at P>0,05.

Table 6 indicate significant associations between sociodemographic factors and communication skills within the experimental and control groups. Notably, family size significantly impacts communication skills, with participants from families with 3-7 members demonstrating higher competence compared to those with 8—16 members (χ^2=5,490, p=0,019*). Furthermore, participants in Level 7 exhibit lower competence in communication skills compared to Levels 8 and 9 in the experimental group (χ^2=4,334, p=0,114), while a similar trend is observed in the control group (χ^2=4,175, p=0,124). While other factors such as nationality, age, and income do not show significant differences.

Table 7 shows that the Significant differences in attitude are observed based on the level of study in both groups (experimental: χ^2=9,447, p=0,009*; control: χ^2=2,329, p=0,312), particularly with Level 7 participants in the experimental group exhibiting significantly more negative attitudes. Income significantly influences attitude in the experimental group (χ^2=7,948, p=0,047*), with low-income backgrounds associated with more negativity. While other factors such as nationality, age, level of parent education do not reach statistical significance, suggesting potential avenues for targeted interventions to address attitude differences among participants.

Table 8 showed that significant differences in intervention ability are observed based on the level of study in both groups (experimental: χ^2=13,804, p=0,001*; control: χ^2=2,064, p=0,356). Participants in Level 7 in the experimental group exhibit significantly lower intervention ability compared to those in Levels 8 and 9, other factors such as nationality, age, family size, and income do not exhibit significant differences. The data suggests that certain demographic characteristics may influence intervention ability differently depending on the group and the specific characteristic.

Table 9 Significant differences in affective domain of empathy are observed based on the level of study in the experimental group (χ^2=5,361, p=0,069), with participants in Level 7 showing significantly lower positivity compared to other levels. while other sociodemographic factors like nationality, age, family size, and income do not exhibit significant differences. These findings suggest potential variations in empathy levels based on certain demographic characteristics, emphasizing the need for targeted interventions to enhance empathy across different groups.

Table 10 shows that the significant differences in cognitive domain of empathy are observed based on the level of study in both groups (experimental: χ^2=10,009, p=0,007*; control: χ^2=14,954, p=0,001*). Participants in Level 7 in both groups exhibit significantly lower empathy compared to other levels. while others such as nationality, age, family size, and income do not exhibit significant differences. These findings suggest potential variations in empathy levels based on certain demographic characteristics, indicating the importance of tailored interventions to foster empathy across different groups.

Table 11 examines sociodemographic factors impacting empathy levels. No significant difference in empathy is seen across study levels in the experimental group (χ^2=0,967, p=0,617), but a significant variation is noted in the control group (χ^2=2,989, p=0,224), where Level 7 participants exhibit higher empathy. These results emphasize the intricate nature of empathy and

its connection to demographic traits, highlighting the need for tailored empathy-building strategies for diverse populations.

In Figure 3, the Experimental group, post-intervention, showed substantial improvements across various metrics. 83,3% demonstrated satisfactory knowledge, 79,8% exhibited competent communication skills, 70,2% showcased positive attitudes, and 79,8% displayed enhanced abilities to intervene and manage bullying situations. Conversely, the Control group, despite not receiving intervention training, also showed significant improvements from pre-intervention to post-intervention, though specific numbers aren't provided.

Figure 4 depicts the Experimental group across-the-board improvements in empathy domains post-intervention. Pre-intervention, percentages for empathy domains were 45,2%, 38,1%, and 35.7%, respectively, which increased to 54,0%, 61,9%, and 64,3% post-intervention. Surprisingly, the Control group had higher scores in all empathy domains during the pre-assessment, with percentages of 53,5%, 54,9%, and 57,7%, respectively. However, these scores declined to 46,5%, 45,1%, and 42,3%, respectively, in the post-assessment.

Discussion

The study presents the results of an experimental investigation that examined the efficacy of a bullying prevention program in a girls' school in Saudi Arabia. It provides an overview of the prevalence of bullying among school children, their knowledge regarding bullying, and their capacity for empathy towards others. The findings related to the first research question (RQ 1), assessing the impact of the prevention training program on the knowledge of adolescent students before and after the intervention, are presented in Table 3. The study found that the prevention training program effectively contributed to a reduction in both bullying experiences and witness accounts among students in the experimental group. A statistically significant decrease in the occurrence of these two aspects was observed within the experimental group in comparison to the control group.

The studies provide evidence for the value of implementing such programs to address bul-

lying among adolescents. The findings of the study presented in Table 3 show significant differences observed in several items within the experimental group, but no significant differences were detected in cognitive emotional empathy, effective emotional empathy, and total empathy. The observed reduction in bullying experiences among the experimental group had a moderate effect size (d=0,47, p<0,001), indicating a meaningful but not overwhelming impact of the prevention program. A similar outcome was reported by [26] in their study on a bystander intervention program aimed at reducing bullying in an ethnically diverse, low-income community school. They found a significant increase in knowledge and confidence, as well as a significant decrease in bullying behavior among students who underwent the training.

Moreover, the impact of a prevention program on bullying behavior and empathy reported that the program effectively increased knowledge and enhanced attitudes related to bullying, but did not have a significant impact on cognitive-emotional empathy, effective emotional empathy, and total empathy. The effect sizes for knowledge, communication skills, and attitudes regarding bullying and empathy were moderate to large, indicating practical significance. However, the specific components of empathy assessed in the study may require more time or a different approach to be effectively influenced by the prevention program.

A study by [40] found that bullying prevention programs may not lead to significant changes in empathy. Our study's results align with this, as empathy did not differ significantly between the experimental and control groups. Empathy is complex and influenced by various factors, making it challenging to measure. More research is necessary to evaluate long-term improvements in empathy after intervention and to gain a deeper understanding of how empathy evolves during the program. The conclusion of this study regarding empathy outcomes may not be definitive based solely on its findings. However, it highlights the need for more research and improvement of programs that aim to promote empathy in teenagers. It is worth noting that the current study's results are in contrast

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to previous research, which has shown positive effects of prevention programs on empathy. For example, [44]) conducted a study on a bullying prevention intervention and found that it led to improvements in empathy among the participants. Similarly, [41] reported positive effects on empathy-related outcomes among students as a result of a school-based intervention. However, some studies have yielded contrasting results. For instance, a survey by [20] found that although a prevention program resulted in significant changes in attitudes and behaviors related to bullying, there were no notable differences in knowledge scores. This suggests that educational interventions' impact on knowledge may vary depending on the specific program content, duration, and implementation. It is important to consider that knowledge alone may not be sufficient to bring about substantial changes in attitudes and behaviors related to bullying. Comprehensive prevention programs often aim to address multiple factors, such as promoting empathy, enhancing communication skills, and fostering positive school environments. [17] conducted a study evaluating a school-based bullying prevention program and found a significant increase in knowledge scores among participants who received the intervention.

Moreover, the study found that the educational program was successful in improving students' understanding of bullying. The intervention program was effective in reducing bullying behaviors and promoting positive role models. Participants perceived themselves as defenders instead of bullies or victims. The bystander behavior also shifted positively, indicating increased proactive intervention against bullying incidents. These changes support the effectiveness of the intervention program in fostering a safe school environment.

The Control group undeniably demonstrated a decrease in negative roles, which strongly implies the influence of external factors on the participants' perceptions. It is crucial to note that a higher percentage of participants in the Control group took on the role of witnesses in the post-assessment, indicating a clear and significant improvement in their awareness of the importance of witnessing and reporting bullying incidents,

without the need for direct intervention training. This behavior change is indisputably in line with the Hawthorne effect. It is highly probable that external factors, such as conversations or community-wide initiatives, had a profound impact on the changes observed in the Control group.

Table 1 presents how the demographic factors impacted the effectiveness of pre-post educational training on preventing bullying behavior. The study revealed that the control and experimental groups did not have significant differences in most demographic variables, indicating that the randomization process created comparable groups. However, two demographic variables, income, and the location of the bullying workshops, showed significant differences between the two groups. The income disparity may lead to differences in participants' experiences, perspectives, and available resources, and must be considered when interpreting the study's results. Further investigation is necessary to identify the factors that caused this shift. It's important to note that the unequal distribution of participants between the groups may have introduced bias, despite the lack of a significant difference between them. Therefore, advanced statistical techniques such as propensity score matching, covariate adjustment, subgroup analyses, and sensitivity analyses are necessary to account for differences between the groups and ensure reliable results. Accurate reporting of participant characteristics is essential to interpret the study's findings and draw valid conclusions.

According to the study, there were notable discrepancies in the placement of bullying workshops between the control and experimental groups, which could potentially hinder the program's implementation and necessitate a thorough analysis. It is recommended that further investigation be conducted to examine the impact of variables such as income levels on the outcomes and to make adjustments accordingly. By exploring the interaction between variables and the training program, valuable insights could be gained into their capacity to moderate the effects of reducing bullying and prejudice among adolescents. The study also recognizes that focusing solely on one elementary school for girls with common characteristics may have in-

fluenced the findings, particularly with regard to demographic variables. The experimental group consisted of a larger percentage of students from affluent backgrounds, which could be attributed to their parents' educational attainment.

The findings of this study are in line with previous research such as Shaheen et al.'s [37] study on factors affecting bullying experiences among Jordanian school adolescents. The study revealed that low-income families experienced higher levels of bullying. Furthermore, the study suggests that parental education plays a significant role in participation in Bullying Awareness Workshops, particularly in the experimental group [19; 32].

Another significant result indicated by the study is that most of the participants in both the experimental and control groups reported experiencing bullying mainly from their classmates. This finding is consistent with several similar studies in the field. For instance, [34]; and Santos-Neto's ETD study on bullying among adolescents found that classmates were the most common perpetrators of bullying. Similarly, [41] reported that peer victimization was predominantly carried out by classmates. These studies provide further support for the idea that classmates play a significant role in perpetuating bullying behaviors. However, some studies have reported different results regarding the source of bullying. For example, a study by [14] revealed that adolescents' bullying can originate from multiple sources, including not only classmates but also friends, siblings, and even strangers. This study suggests that the sources of bullying may vary depending on the specific context and individual experiences.

It is crucial to take into account cultural and contextual factors that can impact research findings. For example, [46] discovered in a study conducted in a different cultural context that adolescents were more frequently bullied by their friends than their classmates. This difference emphasizes the significance of cultural diversity when interpreting and generalizing findings related to the sources of bullying. The study "Bullying among children and adolescents in the SAARC countries: A scoping review" revealed that the school environment influences the pattern of bullying in settings where individuals have lim-

ited control over their groups. Bullying can occur among a diverse group of students, including indirect victimization and cyberbullying [16; 36]. Bullies use their power to establish social status, while victims often lack emotional support or defenders. The study's findings suggest that higher-intensity conditions and pronounced hierarchies within classrooms are associated with an increased risk of persistent bullying. In summary, the study underscores the intricate nature of bullying in school settings and the factors that contribute to its occurrence and persistence.

Our study shows that the most common forms of bullying witnessed by participants were physical aggression such as kicking, hitting, or pushing, and verbal aggression using racial slurs or stereotypes. This aligns with previous research by [6]) who found that verbal bullying (41,7%) was the most prevalent type, followed by physical bullying (17,0%), among secondary school children. Similarly, [37] survey of middle and high school adolescents found that girls were most commonly physically threatened or injured (22,1%) and experienced derogatory comments about their race or culture (20,9%).

Regarding our third research question (RQ 3), we found that only participants' educational study level significantly impacted their understanding of how to handle bullying and prejudice. This could be because higher levels of education equip individuals with greater knowledge about diversity, discrimination, and effective communication strategies, which in turn influence their attitudes toward bullying and prejudice. Previous studies by [40] have reported that individuals with higher levels of education possess more knowledge and skills when it comes to managing diversity, discrimination, and communication strategies. [3] have also shown that people with higher education levels tend to have more accepting attitudes towards marginalized groups, as education provides the tools to examine societal issues and cultivate empathy and understanding critically. However, [23] found no consistent correlation between one's education level and ability to empathize. Nevertheless, exposure to diverse perspectives can foster greater understanding and compassion, which has the potential to positively affect attitudes toward bullying and prejudice. The study found that

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physical and verbal aggression, including racial slurs and stereotypes, were the most common forms of bullying [48] These findings align with previous research and highlight the need to understand the complex nature of bullying. [15] Additionally, further research could delve deeper into the relationship between education level and attitudes towards marginalized groups in the context of bullying and prejudice. Nonetheless, education and exposure to diverse perspectives can play a crucial role in promoting empathy, understanding, and acceptance, which are essential in combating bullying and prejudice behaviors [1].

Conclusion

The study found that a prevention program effectively reduced bullying among adolescents by improving their knowledge, communication skills, and attitudes. 79,8% of participants showed proficient communication during bullying incidents. Further research is needed on empathy aspects. The program emphasizes fostering positive social interactions and safer school environments by focusing on key factors like knowledge, communication, attitudes, and intervention abilities. Continued implementation of evidence-based prevention programs and support for adolescents in developing social-emotional skills are crucial for combatting bullying and promoting positive youth development.

Recommendations:
• The training prevention program effectively enhances knowledge about bullying and its prevention in educational settings.
• Follow-up assessments are recommended to evaluate long-term knowledge retention and monitor changes in empathy levels.
• Emphasizing empathy development is crucial in bullying prevention efforts. Integrating interventions to boost empathy can enhance the program's effectiveness.
• Assessing impacts on communication skills, attitudes, and behavioral outcomes related to bullying is essential.
• Future research should focus on exploring long-term effects and conducting follow-up assessments at different intervals.
• The study highlights the positive influence

of the program on knowledge and emphasizes the importance of nurturing empathy in bullying prevention initiatives.

Research implications:
• The results suggest implications for future research and practical applications in bullying prevention programs.
• Subsequent studies should focus on longitudinal research to assess the lasting impact of prevention programs on knowledge, empathy, and behavioral outcomes.
• Identifying effective components of prevention programs can enhance knowledge in interventions.
• Further investigation into factors affecting empathy development, like program duration and facilitators, is also recommended.

Practical implications:
• The study highlights the need for evidence-based bullying prevention programs in education. Integrating empathy-building activities with knowledge-focused programs is recommended.
• Ongoing training for teachers can improve their skills in addressing bullying.
• Consistent implementation and evaluation of prevention programs are crucial.
• Future studies should focus on effective strategies for reducing bullying and fostering positive school environments.

Limitations of the study:
• Despite the proven effect of the training prevention program, the study has several limitations:
• Limited generalizability due to unequal participant distribution and being conducted in one school.
• Focused only on girls, limiting conclusions for boys or mixed-gender settings.
• Lack of long-term follow-up to assess sustained effects.
• Participants not classified into bully, victim, or bully/victim groups for comprehensive analysis.
• Social desirability bias may have affected responses.

- Consider these limitations for interpreting findings and recommend further research with larger, diverse samples for improved validity and generalizability.

Table 1

Distribution of the studied participants according to their demographic characteristics N=155

Sociodemographic	Experimental (n.84)		Control (n.71)		Test of sig-nificance
	No.	%	No.	%	
Nationality					
Saudi	51	60.7	46	64.8	X^2: 0.273 P:0.601
Non-Saudi	33	39.3	25	35.2	
Age					
Early	15	17.9	19	26.8	X^2:2.102 P:0.350
Middle	56	66.7	40	56.3	
Late	13	15.5	12	16.9	
Mean ± SD	13.52±1.0		13.37±1.2		
No. of family					
3—7	64	76.2	54	76.1	X^2:0.000 P:0.984
8—16	20	23.8	17	23.9	
Mean ± SD	6.7±1.8		6.4±2.0		
Ranking					
1—3	46	54.8	40	56.3	X^2:1.793 P:0.408
4—6	32	38.1	22	31.0	
7 and more	6	7.1	9	12.7	
Level of study					
Level 7	22	26.2	26	36.6	X^2:2.484 P:0.289
Level 8	32	38.1	20	28.2	
Level 9	30	35.7	25	35.2	
Father's education					
Died	10	11.9	6	8.5	X^2:8.021 P:0.155
Elementary	1	1.2	1	1.4	
Middle	7	8.3	5	7.0	
Secondary	14	16.7	21	29.6	
University	52	61.9	35	49.3	
Post study (Master, PhD)	0	0.0	3	4.2	
Mother's education					
Died	13	15.5	8	11.3	X^2:6.673 P:0.246
Elementary	1	1.2	6	8.5	
Middle	8	9.5	4	5.6	
Secondary	15	17.9	12	16.9	
University	46	54.8	41	57.7	
post study (Master, PhD)	1	1.2	0	0.0	
Income					
Average	58	69.0	61	85.9	X^2:8.042 P:0.045*

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Above average	7	8.3	3	4.2	
High	10	11.9	6	8.5	
Low	9	10.7	1	1.4	
Previous Attendance of bullying and racial discrimination training activities					
No	39	46.4	33	46.5	X^2:0.000 P:0.995
Yes	45	53.6	38	53.5	
Place of Attendance of bullying and racial discrimination training activities					
In school	41	87.2	26	68.4	X^2:4.445 P:0.035*
Out of school	6	12.8	12	31.6	

Table 2

**Distribution of the studied participants according to their experiences with bullying
or prejudices N=155**

Variables	Experimental (n.84)		Control (n.71)		Test of significance
	O	%	No.	%	
Previous Experience with bullying and racial discrimination					
No	41	48.8	28	39.4	X^2:1.369 P:0.242
Yes	43	51.2	43	60.6	
Who is the bully					
Classmate	30	68.2	25	59.5	X^2:0.794 P:0.672
Class teachers	5	11.4	7	16.7	
family member	9	20.5	10	23.8	
Previous Bullying Experience Witness Bullying Experience					
1- A person calls another person with inappropriate names	2.4±1.8		2.9±1.9		t:-1.704 P:0.90
2. Someone kicks, hits, or pushes another person	2.3±1.8		3.1±1.9		t:-2.597 P:0.010*
3. Someone excludes another person from an activity or group.	2.7±1.9		2.8±2.0		t:-.197 P:0.844
4- A person who uses racial slurs or stereotypes against others	2.2±1.9		3.0±2.2		t:-2.339 P:0.021*
5. Someone makes someone feel bad about themselves.	2.6±1.8		2.9±2.2		t:-.949 P:0.345
6- Someone uses technology (social networks) against others	2.5±2.0		2.7±2.2		t:-.693 P:0.489
Involved in Bullying Experience					
1- A person calls another person with inappropriate names	2.9±1.7		2.6±1.7		t:1.197 P:.233
2. Someone kicks, hits, or pushes another person	2.8±1.8		2.8±1.9		t:.062 P:.951
3. Someone excludes another person from an activity or group.	2.4±1.7		2.5±1.9		t:-.493 P:.623
4- A person who uses racial slurs or stereotypes against others	2.5±1.8		2.4±2.0		t:.333 P:.740
5. Someone makes someone feel bad about themselves.	2.5±1.7		2.5±2.0		t:.121 P:.904

6- Someone uses technology (social networks) against others	2.7±1.7	2.4±2.0	t:.775 P:.440

Table 3

Distribution and Comparison of Experimental (N=84) And Control Groups (N=71) According to Their Knowledge, Communication Skills, Attitudes, Ability to Intervene, And Empathy

Domains	Experimental Group		Sig.	Control Group		Sig.	Significance between groups (EXP./CON)	
	Pre	Post		Pre	Post		Pre	Post
Total knowl-edge score	42.4±21.9	80.1±27.8	t: --15.622 P<0.001*	41.7±20.6	62.5±21.4	t-11.046 P<0.001*	t.197 P. 844	t4.436 P<0.001*
r (effect size)	−0.85432			0.790278				
Total communi-cation skills	46.0±22.1	67.0±27.2	t-12.411 P<0.001*	49.2±25.3	71.0±22.8	t-9.896 P<0.001*	t-.857 P.393	t1.244 P.215
r (effect size)	−0.80914773			−0.81569847				
Total attitudes	44.0±26.3	73.5±31.5	t-10.929 P<0.001*	50.1±27.8	64.1±25.5	t-5.232 P<0.001*	t-1.404 P.162	t2.053 P.042*
r (effect size)	−0.5631279			−0.8026054				
Total ability to intervene	53.8±26.0	77.5±28.2	t-11.920 P<0.001*	57.5±28.0	72.9±24.9	t-6.356 P<0.001*	t-.863 P.390	t1.072 P.285
r (effect size)	−0.63528422			−0.80293273				
Total affective emotional empathy	53.0±14.0	54.6±17.0	t-.868 P 0.388	55.7±13.7	48.9±15.0	t3.117 P 0.003*	t-1.209 P.229	T2.199 P.029*
r (effect size)	−0.34654			−0.06350141				
Total cogni-tive emotional empathy	55.7±13.6	57.7±13.4	t-1.121 P 0.266	58.2±14.9	46.6±14.7	t5.228 P<0.001*	t-1.113 P.267	T4.917 P<0.001*
r (effect size)	−0.54425807			−0.150025				
Total empathy	54.3±11.6	56.2±13.1	t-1.221 P 0.225	57.0±12.8	47.7 ±13.2	t4.809 P<0.001*	t-1.324 P.188	T3.955 P<0.001*
r (effect size)	−0.481596			−0.01745743				

Note: r: the effect size (small effect size 0,2, medium effect size 0,5, large effect size 0,8).

Table 4

Comparison between experimental and control group related to participants 'abilities to perceive their role in dealing with bullying behavior and prejudice N=155

Paired Samples Statistics							
Group		Mean	N	Std. De-viation	Std. Er-ror Mean	t	Sig. (2-tailed)
Experimental. Pair 1	Abilities to perceive their role In the Past	2.90	84	.80089	.08738	−6.028	.000
	Abilities to perceive their role Now	3.54	84	.62873	.06860		

Control. Pair 1	Abilities to perceive their role In the Past	2.78	71	.98439	.11683	-6.028	.000
	Abilities to perceive their role Now	3.54	71	.71292	.08461		

Table 5

Correlation between participants demographic characteristics among Exp. and Cont. group as regards their level of knowledge

Sociodegraphic	Knowledge									
	Experimental (n.84)					Control (n.71)				
	Inadequate		Adequate		Sig.	Inadequate		Adequate		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	10	19.6%	41	80.4%	X2:.809 P:.369	20	43.5%	26	56.5%	X2: 1.647 P:.199
Non-Saudi	4	12.1%	29	87.9%		7	28.0%	18	72.0%	
Age										
Early	2	13.3%	13	86.7%	X2: 1.231 P:.540	10	52.6%	9	47.4%	X2: 4.048 P:.132
Middle	11	19.6%	45	80.4%		15	37.5%	25	62.5%	
Late	1	7.7%	12	92.3%		2	16.7%	10	83.3%	
No. of family										
3—7	12	18.8%	52	81.2%	X2: .840 P:.359	23	42.6%	31	57.4%	X2: 1.994 P:.158
8—16	2	10.0%	18	90.0%		4	23.5%	13	76.5%	
Ranking										
1—3	7	15.2%	39	84.8%	X2: 1.895 P:.388	19	47.5%	21	52.5%	X2: 3.557 P:.169
4—6	7	21.9%	25	78.1%		6	27.3%	16	72.7%	
7 and more	0	0.0%	6	100.0%		2	22.2%	7	77.8%	
Level of study										
Level 7	4	18.2%	18	81.8%	X2: 3.796 P:.159	16	61.5%	10	38.5%	X2: 10.093 P:.006*
Level 8	8	25.0%	24	75.0%		6	30.0%	14	70.0%	
Level 9	2	6.7%	28	93.3%		5	20.0%	20	80.0%	
Father's education										
Died	1	10.0%	9	90.0%	X2: 5.421 P:.247	1	16.7%	5	83.3%	X2: 6.280 P:.280
Elementary	1	100.0%	0	0.0%		1	100.0%	0	0.0%	
Middle	1	14.3%	6	85.7%		2	40.0%	3	60.0%	
Secondary	2	14.3%	12	85.7%		5	23.8%	16	76.2%	
University	9	17.3%	43	82.7%		17	48.6%	18	51.4%	
Post-study (Master, PhD)	0	0.0%	0	0.0%		1	33.3%	2	66.7%	
Mother's education										
Died	3	23.1%	10	76.9%	X2: 7.218 P:.205	2	25.0%	6	75.0%	X2: 6.316 P:.177
Elementary	1	100.0%	0	0.0%		1	16.7%	5	83.3%	
Middle	2	25.0%	6	75.0%		2	50.0%	2	50.0%	
Secondary	3	20.0%	12	80.0%		2	16.7%	10	83.3%	
University	5	10.9%	41	89.1%		20	48.8%	21	51.2%	

post study (Master, PhD)	0	0.0%	1	100.0%		0	0.0%	0	0.0%	
Income											
Average	10	17.2%	48	82.8%	X2: 3.534 P:.316	23	37.7%	38	62.3%	X2: 1.717 P:.633
Above average	0	0.0%	7	100.0%		2	66.7%	1	33.3%	
High	1	10.0%	9	90.0%		2	33.3%	4	66.7%	
Low	3	33.3%	6	66.7%		0	0.0%	1	100.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 6

Correlation between participants' demographic characteristics among exp. and cont. the group as regards their communication skills

	Communication Skills									
	Experimental (n.84)					Control (n.71)				
Sociodemographic	Incompetent		Competent		Sig.	Incompetent		Competent		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	10	19.6%	41	80.4%	X2: .032 P:.858	9	19.6%	37	80.4%	X2: .002 P:.965
Non-Saudi	7	21.2%	26	78.8%		5	20.0%	20	80.0%	
Age										
Early	2	13.3%	13	86.7%	X2: 1.348 P:.510	4	21.1%	15	78.9%	X2: 1.199 P:.549
Middle	11	19.6%	45	80.4%		9	22.5%	31	77.5%	
Late	4	30.8%	9	69.2%		1	8.3%	11	91.7%	
No. of family										
3—7	14	21.9%	50	78.1%	X2:.446 P:.54	14	25.9%	40	74.1%	X2:5.490 P:.019*
8—16	3	15.0%	17	85.0%		0	0.0%	17	100.0%	
Ranking										
1—3	8	17.4%	38	82.6%	X2:2.986 P:.225	11	27.5%	29	72.5%	X2:4.255 P:.119
4—6	9	28.1%	23	71.9%		3	13.6%	19	86.4%	
7 and more	0	0.0%	6	100.0%		0	0.0%	9	100.0%	
Level of study										
Level 7	2	9.1%	20	90.9%	X2:4.334 P:.114	8	30.8%	18	69.2%	X2:4.175 P:.124
Level 8	10	31.2%	22	68.8%		4	20.0%	16	80.0%	
Level 9	5	16.7%	25	83.3%		2	8.0%	23	92.0%	
Father's education										
Died	3	30.0%	7	70.0%	X2:6.046 P:.196	2	33.3%	4	66.7%	X2:1.693 P:.890
Elementary	1	100.0%	0	0.0%		0	0.0%	1	100.0%	
Middle	1	14.3%	6	85.7%		1	20.0%	4	80.0%	
Secondary	4	28.6%	10	71.4%		3	14.3%	18	85.7%	
University	8	15.4%	44	84.6%		7	20.0%	28	80.0%	
Post study (Master, PhD)	0	0.0%	0	0.0%		1	33.3%	2	66.7%	
Mother's education										
Died	5	38.5%	8	61.5%	X2:9.025 P:.108	3	37.5%	5	62.5%	X2:4.254 P:.373

Elementary	1	100.0%	0	0.0%		0	0.0%	6	100.0%	
Middle	1	12.5%	7	87.5%		1	25.0%	3	75.0%	
Secondary	4	26.7%	11	73.3%		1	8.3%	11	91.7%	
University	6	13.0%	40	87.0%		9	22.0%	32	78.0%	
post study (Master, PhD)	0	0.0%	1	100.0%		0	0.0%	0	0.0%	
Income										
Average	12	20.7%	46	79.3%	X2:5.700 P:.127	12	19.7%	49	80.3%	X2:.632 P:.889
Above average	0	0.0%	7	100.0%		1	33.3%	2	66.7%	
High	1	10.0%	9	90.0%		1	16.7%	5	83.3%	
Low	4	44.4%	5	55.6%		0	0.0%	1	100.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 7

Correlation Between Ability to Intervene and Demographic Background of Experimental and Control Group

Sociodemographic	Attitude									
	Experimental (n.84)					Control (n.71)				
	Negative		Positive		Sig.	Negative		Positive		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	15	29.4%	36	70.6%	X2:.008 P:.930	21	45.7%	25	54.3%	X2:3.222 P:.073
Non-Saudi	10	30.3%	23	69.7%		6	24.0%	19	76.0%	
Age										
Early	4	26.7%	11	73.3%	X2:.577 P:.749	9	47.4%	10	52.6%	X2:5.533 P:.063
Middle	16	28.6%	40	71.4%		17	42.5%	23	57.5%	
Late	5	38.5%	8	61.5%		1	8.3%	11	91.7%	
No. of family										
3—7	21	32.8%	43	67.2%	X2:1.197 P:.274	23	42.6%	31	57.4%	X2:1.994 P:.158
8—16	4	20.0%	16	80.0%		4	23.5%	13	76.5%	
Ranking										
1—3	13	28.3%	33	71.7%	X2:3.509 P:.173	18	45.0%	22	55.0%	X2:2.139 P:.343
4—6	12	37.5%	20	62.5%		7	31.8%	15	68.2%	
7 and more	0	0.0%	6	100.0%		2	22.2%	7	77.8%	
Level of study										
Level 7	7	31.8%	15	68.2%	X2:2.329 P:.312	15	57.7%	11	42.3%	X2:9.447 P:.009*
Level 8	12	37.5%	20	62.5%		8	40.0%	12	60.0%	
Level 9	6	20.0%	24	80.0%		4	16.0%	21	84.0%	
Father's education										
Died	4	40.0%	6	60.0%	X2:3.668 P:.453	4	66.7%	2	33.3%	X2:3.674 P:597
Elementary	1	100.0%	0	0.0%		0	0.0%	1	100.0%	
Middle	2	28.6%	5	71.4%		1	20.0%	4	80.0%	
Secondary	5	35.7%	9	64.3%		7	33.3%	14	66.7%	
University	13	25.0%	39	75.0%		14	40.0%	21	60.0%	

Post study (Master, PhD)	0	0.0%	0	0.0%		1	33.3%	2	66.7%	
Mother's education											
Died	6	46.2%	7	53.8%	X2:7.724 P:.172	5	62.5%	3	37.5%	X2:7.028 P:.091
Elementary	1	100.0%	0	0.0%		2	33.3%	4	66.7%	
Middle	6	40.0%	9	60.0%		2	50.0%	2	50.0%	
Secondary	9	19.6%	37	80.4%		1	8.3%	11	91.7%	
University	0	0.0%	1	100.0%		17	41.5%	24	58.5%	
post study (Master, PhD)	0	0.0%	0	0.0%		0	0.0%	0	0.0%	
Income											
Average	19	32.8%	39	67.2%	X2:7.948 P:.047*	24	39.3%	37	60.7%	X2:2.864 P:.413
Above average	0	0.0%	7	100.0%		2	66.7%	1	33.3%	
High	1	10.0%	9	90.0%		1	16.7%	5	83.3%	
Low	5	55.6%	4	44.4%		0	0.0%	1	100.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 8

Correlation Between Ability to Intervene and Demographic Background Of Experimental and Control Group

Sociodemographic	Ability to intervene									
	Experimental (n.84)					Control (n.71)				
	Unable		Able		Sig.	Unable		Able		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	12	23.5%	39	76.5%	X2:.871 P:.351	14	30.4%	32	69.6%	X2:.900 P:.343
Non-Saudi	5	15.2%	28	84.8%		5	20.0%	20	80.0%	
Age										
Early	1	6.7%	14	93.3%	X2:2.084 P:.353	8	42.1%	11	57.9%	X2:3.277 P:.194
Middle	13	23.2%	43	76.8%		9	22.5%	31	77.5%	
Late	3	23.1%	10	76.9%		2	16.7%	10	83.3%	
No. of family										
3—7	14	21.9%	50	78.1%	X2:.446 P:.504	16	29.6%	38	70.4%	X2:.947 P:.330
8—16	3	15.0%	17	85.0%		3	17.6%	14	82.4%	
Ranking										
1—3	11	23.9%	35	76.1%	X2:.854 P:.652	14	35.0%	26	65.0%	X2:3.414 P:.181
4—6	5	15.6%	27	84.4%		3	13.6%	19	86.4%	
7 and more	1	16.7%	5	83.3%		2	22.2%	7	77.8%	
Level of study										
Level 7	3	13.6%	19	86.4%	X2:2.064 P:.356	13	50.0%	13	50.0%	X2:13.804 P:.001*
Level 8	9	28.1%	23	71.9%		5	25.0%	15	75.0%	
Level 9	5	16.7%	25	83.3%		1	4.0%	24	96.0%	
Father's education										
Died	4	40.0%	6	60.0%	X2:7.098 P:.131	3	50.0%	3	50.0%	X2:7.465 P:.188

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Elementary	1	100.0%	0	0.0%		1	100.0%	0	0.0%	
Middle	1	14.3%	6	85.7%		0	0.0%	5	100.0%	
Secondary	2	14.3%	12	85.7%		5	23.8%	16	76.2%	
University	9	17.3%	43	82.7%		10	28.6%	25	71.4%	
Post study (Master, PhD)	0	0.0	0	0.0		0	0.0%	3	100.0%	
Mother's education										
Died	5	38.5%	8	61.5%	X2:11.036 P:.051	3	37.5%	5	62.5%	X2:3.380 P:.496
Elementary	1	100.0%	0	0.0%		1	16.7%	5	83.3%	
Middle	1	12.5%	7	87.5%		0	0.0%	4	100.0%	
Secondary	0	0.0%	15	100.0%		2	16.7%	10	83.3%	
University	10	21.7%	36	78.3%		13	31.7%	28	68.3%	
post study (Master, PhD)	0	0.0%	1	100.0%		0	0.0	0	0.0	
Income										
Average	13	22.4%	45	77.6%	X2:3.552 P:.314	16	26.2%	45	73.8%	X2:3.124 P:.373
Above average	0	0.0%	7	100.0%		2	66.7%	1	33.3%	
High	1	10.0%	9	90.0%		1	16.7%	5	83.3%	
Low	3	33.3%	6	66.7%		0	0.0%	1	100.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 9

Correlation Between Affective Domain of Empathy and Demographic Background of Experimental and Control Group

Sociodemographic	Affective									
	Experimental (n.84)					Control (n.71)				
	Negative		Positive		Sig.	Negative		Positive		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	22	43.1%	29	56.9%	X2:.231 P:.631	23	50.0%	23	50.0%	X2:.651 P:.420
Non-Saudi	16	48.5%	17	51.5%		15	60.0%	10	40.0%	
Age										
Early	8	53.3%	7	46.7%	X2:.529 P:.767	11	57.9%	8	42.1%	X2:1.563 P:.458
Middle	24	42.9%	32	57.1%		19	47.5%	21	52.5%	
Late	6	46.2%	7	53.8%		8	66.7%	4	33.3%	
No. of family										
3—7	26	40.6%	38	59.4%	X2:2.309 P:.129	28	51.9%	26	48.1%	X2.253 P:.615
8—16	12	60.0%	8	40.0%		10	58.8%	7	41.2%	
Ranking										
1—3	18	39.1%	28	60.9%	X2:2.098 P:.350	21	52.5%	19	47.5%	X2:.589 P:.745
4—6	16	50.0%	16	50.0%		13	59.1%	9	40.9%	
7 and more	4	66.7%	2	33.3%		4	44.4%	5	55.6%	
Level of study										
Level 7	10	45.5%	12	54.5%	X2:.054 P:.973	18	69.2%	8	30.8%	X2:5.361 P:.069

Level 8	14	43.8%	18	56.3%		7	35.0%	13	65.0%	
Level 9	14	46.7%	16	53.3%		13	52.0%	12	48.0%	
Father's education									
Died	3	30.0%	7	70.0%	X2:2.287 P:.683	4	66.7%	2	33.3%	X2:3.312 P:.652
Elementary	0	0.0%	1	100.0%		0	0.0%	1	100.0%	
Middle	3	42.9%	4	57.1%		3	60.0%	2	40.0%	
Secondary	6	42.9%	8	57.1%		13	61.9%	8	38.1%	
University	26	50.0%	26	50.0%		16	45.7%	19	54.3%	
Post study (Master, PhD)	0	0.0	0	0.0		2	66.7%	1	33.3%	
Mother's education									
Died	4	30.8%	9	69.2%	X2:4.651 P:.460	4	50.0%	4	50.0%	X2:5.627 P:.229
Elementary	0	0.0%	1	100.0%		3	50.0%	3	50.0%	
Middle	3	37.5%	5	62.5%		2	50.0%	2	50.0%	
Secondary	6	40.0%	9	60.0%		3	25.0%	9	75.0%	
University	25	54.3%	21	45.7%		26	63.4%	15	36.6%	
post study (Master, PhD)	0	0.0%	1	100.0%		0	0.0	0	0.0	
Income									
Average	26	44.8%	32	55.2%	X2:1.414 P:.702	30	49.2%	31	50.8%	X2:4.353 P:.226
Above average	3	42.9%	4	57.1%		3	100.0%	0	0.0%	
High	6	60.0%	4	40.0%		4	66.7%	2	33.3%	
Low	3	33.3%	6	66.7%		1	100.0%	0	0.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 10

Correlation Between Cognitive Domain of Empathy and Demographic Background of Experimental and Control Group

Sociodemographic	Cognitive									
	Experimental (n.84)					Control (n.71)				
	Concret		Abstract		Sig.	Concrete		Abstract		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	16	31.4%	16	48.5%	X2:2.488 P:.115	25	54.3%	21	45.7%	X2:.018 P:.894
Non-Saudi	35	68.6%	17	51.5%		14	56.0%	11	44.0%	
Age										
Early	4	26.7%	11	73.3%	X2:1.042 P:.594	13	68.4%	6	31.6%	X2:3.658 P:.161
Middle	23	41.1%	33	58.9%		22	55.0%	18	45.0%	
Late	5	38.5%	8	61.5%		4	33.3%	8	66.7%	
No. of family										
3—7	24	37.5%	40	62.5%	X2:.040 P:.841	33	61.1%	21	38.9%	X2:3.481 P:.062
8—16	8	40.0%	12	60.0%		6	35.3%	11	64.7%	
Ranking										
1—3	15	32.6%	31	67.4%	X2:1.691 P:.429	26	65.0%	14	35.0%	X2:4.703 P:.095

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4—6	15	46.9%	17	53.1%		8	36.4%	14	63.6%	
7 and more	2	33.3%	4	66.7%		5	55.6%	4	44.4%	
Level of study									
Level 7	5	22.7%	17	77.3%	X2:10.009 P:.007*	19	73.1%	7	26.9%	X2:14.954 P:.001*
Level 8	19	59.4%	13	40.6%		14	70.0%	6	30.0%	
Level 9	8	26.7%	22	73.3%		6	24.0%	19	76.0%	
Fatheeducation									
Died	5	50.0%	5	50.0%	X2:1.371 P:.849	5	83.3%	1	16.7%	X2:4.314 P:.505
Elementary	0	0.0%	1	100.0%		0	0.0%	1	100.0%	
Middle	3	42.9%	4	57.1%		2	40.0%	3	60.0%	
Secondary	5	35.7%	9	64.3%		11	52.4%	10	47.6%	
University	19	36.5%	33	63.5%		20	57.1%	15	42.9%	
Post study (Master, PhD)	0	0.0	0	0.0		1	33.3%	2	66.7%	
Mother's education									
Died	4	30.8%	9	69.2%	X2:6.998 P:.221	6	75.0%	2	25.0%	X2:5.337 P:.254
Elementary	0	0.0%	1	100.0%		2	33.3%	4	66.7%	
Middle	6	75.0%	2	25.0%		1	25.0%	3	75.0%	
Secondary	4	26.7%	11	73.3%		5	41.7%	7	58.3%	
University	18	39.1%	28	60.9%		25	61.0%	16	39.0%	
post study (Master, PhD)	0	0.0%	1	100.0%						
Income									
Average	21	36.2%	37	63.8%	X2:.324 P:.955	32	52.5%	29	47.5%	X2:4.165 P:.244
Above average	3	42.9%	4	57.1%		3	100.0%	0	0.0%	
High	4	40.0%	6	60.0%		4	66.7%	2	33.3%	
Low	4	44.4%	5	55.6%		0	0.0%	1	100.0%	

Note: X2: Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

Table 11

Correlation Between Empathy and Demographic Background of The Experimental and Control Group

Sociodemographic	Total Empathy									
	Experimental (n.84)					Control (n.71)				
	Sympathy		Empathy		Sig.	Sympathy		Empathy		Sig.
	No.	%	No.	%		No.	%	No.	%	
Nationality										
Saudi	17	33.3%	34	66.7%	X2:.321 P:.571	26	56.5%	20	43.5%	X2:.080 P:.777
Non-Saudi	13	39.4%	20	60.6%		15	60.0%	10	40.0%	
Age										
Early	6	40.0%	9	60.0%	X2:1.048 P:.592	10	52.6%	9	47.4%	X2:.869 P:.648
Middle	18	32.1%	38	67.9%		25	62.5%	15	37.5%	
Late	6	46.2%	7	53.8%		6	50.0%	6	50.0%	
No. of family										

3—7	22	34.4%	42	65.6%	X2:.210 P:.647	33	61.1%	21	38.9%	X2:1.046 P:.306
8-16	8	40.0%	12	60.0%		8	47.1%	9	52.9%	
Ranking										
1—3	14	30.4%	32	69.6%	X2:1.473 P:.479	25	62.5%	15	37.5%	X2:.929 P:.628
4—6	14	43.8%	18	56.3%		11	50.0%	11	50.0%	
7 and more	2	33.3%	4	66.7%		5	55.6%	4	44.4%	
Level of study										
Level 7	6	27.3%	16	72.7%	X2:.967 P:.617	17	65.4%	9	34.6%	X2:2.989 P:.224
Level 8	12	37.5%	20	62.5%		13	65.0%	7	35.0%	
Level 9	12	40.0%	18	60.0%		11	44.0%	14	56.0%	
Father's education										
Died	2	20.0%	8	80.0%	X2:2.113 P:.715	5	83.3%	1	16.7%	X2:3.728 P.589
Elementary	0	0.0%	1	100.0%		0	0.0%	1	100.0%	
Middle	3	42.9%	4	57.1%		2	40.0%	3	60.0%	
Secondary	6	42.9%	8	57.1%		12	57.1%	9	42.9%	
University	19	36.5%	33	63.5%		20	57.1%	15	42.9%	
Post study (Master, PhD)	0	0.0	0	0.0		2	66.7%	1	33.3%	
Mother's education										
Died	1	7.7%	12	92.3%	X2:7.584 P:.181	5	62.5%	3	37.5%	X2:4.356 P:.360
Elementary	0	0.0%	1	100.0%		3	50.0%	3	50.0%	
Middle	3	37.5%	5	62.5%		2	50.0%	2	50.0%	
Secondary	5	33.3%	10	66.7%		4	33.3%	8	66.7%	
University	21	45.7%	25	54.3%		27	65.9%	14	34.1%	
post study (Master, PhD)	0	0.0%	1	100.0%		0	0.0	0	0.0	
Income										
Average	18	31.0%	40	69.0%	X2:3.300 P:.348	32	52.5%	29	47.5%	X2:5.236 P:.155
Above average	3	42.9%	4	57.1%		3	100.0%	0	0.0%	
High	6	60.0%	4	40.0%		5	83.3%	1	16.7%	
Low	3	33.3%	6	66.7%		1	100.0%	0	0.0%	

Note: X2:Chi-square test; P: P value of significance; *: Significance at P value less than 0,05.

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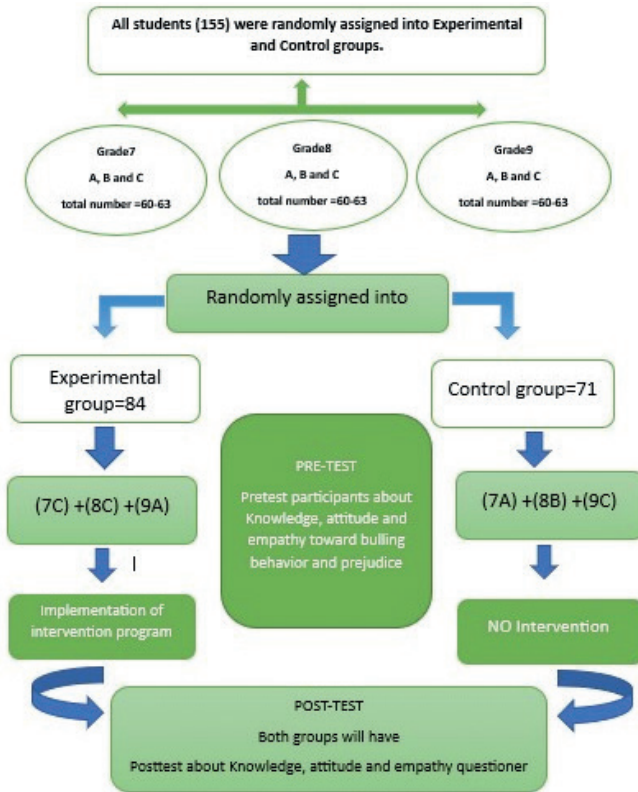Psychological Science and Education. 2024. Vol. 29, no. 3

Figure 1 Study Flow and Random Assignment of Exp. and Control Groups

Fig. 1. Study Flow and Random Assignment of Exp. and Control Group**:** each student level divided into
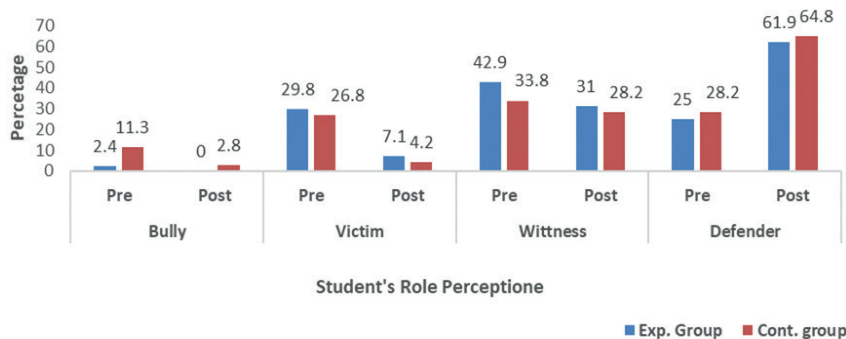3 classes as G7 A,G7 B, and G7 C

Fig. 2. Comparison between Experimental and control groups about roles pre/post-intervention
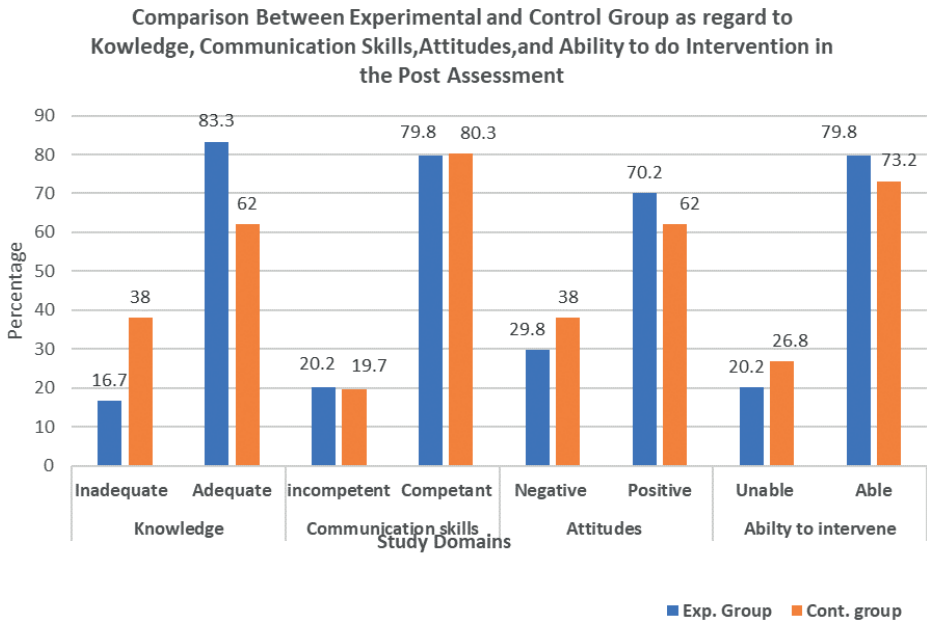
Fig. 3. Comparison between Experimental and control groups about knowledge, communication skills, attitudes, and ability to intervene pre/post
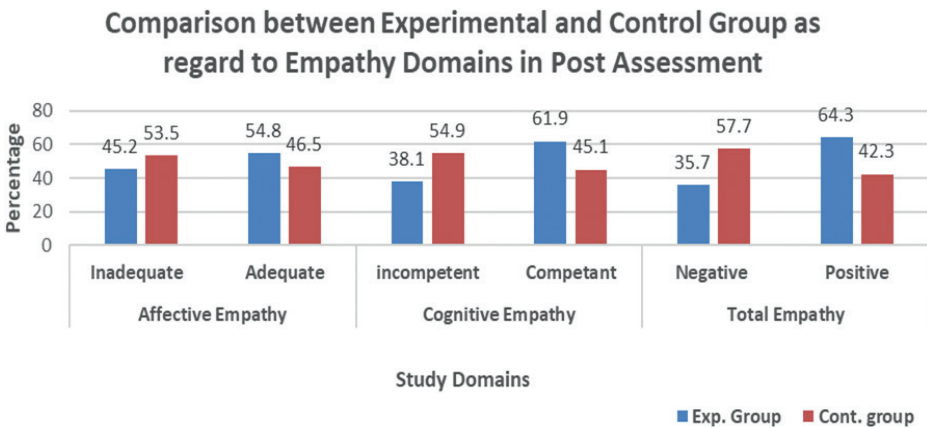

Fig. 4. Comparison between Exp, and Cont. as regards empathy domains/post-intervention

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Development of Social Competence in Preschoolers with Different Levels of Executive Functions: Role Play and Project-based Learning

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The research is aimed at clarifying and comparing the influence of role play and project-based learning on the development of social competence in older preschoolers. The paper presents the materials of the pilot phase of the study. 30 preschoolers aged 5—6 years (average age 5,8 years) participated in the experiment. At the pre-test children's executive functions were assessed using NEPSY-II subtests and their social competence was assessed using the SCBE-30 test, which includes the scales "Social Competence", "Anxiety-detachment", "Anger-aggression". Further, the participants were distributed to three experimental conditions so that in each group there were an equal number of preschoolers with low and high levels of executive functions according to cluster analysis. In each group 12 meetings were held in accordance with the developed programs: Free play, Research project, Creative project. After completing the programs children's social competence was tested similar to the initial diagnostics. The results showed that preschoolers with a low level of executive functions had a stronger decrease in social anxiety in a free role play than in the project activities. At the same time, children with a high level of executive functions showed a greater decrease of the social anxiety when participating in a research project. Role play and project-based learning have proved to be equally effective for the development of social competence. The results clarify and expand the possibilities of using the described activities for the social competence development in kindergartens.

Keywords: early childhood; role play; project-based learning; social competence; anxiety; executive functions.

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Возможности развития социальной компетентности дошкольников с разным уровнем регуляторных функций: сюжетно-ролевая игра и проектная деятельность

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В работе представлены материалы исследования, направленного на уточнение и сопоставление специфики развития социальной компетентности у старших дошкольников в сюжетно-ролевой игре и проектной деятельности. Показаны результаты пилотного этапа исследования, в котором приняли участие 30 дошкольников 5—6 лет (средний возраст — 5,8 лет). На этапе пре-теста у детей были продиагностированы регуляторные функции с помощью методики NEPSY-II и социальная компетентность — с помощью методики SCBE-30, включающей шкалы «Социальная компетентность», «Тревога-отстранение», «Гнев-агрессия». Далее участники были распределены по трем экспериментальным условиям так, чтобы в каждой группе было равное число дошкольников с низким и высоким уровнем регуляторных функций согласно кластерному анализу. В каждой группе было проведено 12 занятий в соответствии с разработанными программами: Свободная игра, Исследовательский проект, Творческий проект. После завершения занятий была проведена диагностика социальной компетентности детей аналогичная начальной. Дошкольники с низким уровнем регуляторных функций показали наиболее сильное снижение социальной тревожности в свободной сюжетно-ролевой игре. В то же время дети с высоким уровнем регуляторных функций показали большее снижение баллов по данному показателю при участии в исследовательском проекте. Сюжетно-ролевая игра и проектная деятельность в оказались в равной степени эффективны для развития социальной компетентности. Полученные результаты уточняют и расширяют возможности применения описанных инструментов для формирования социальной компетентности дошкольников в рамках детских садов.

Ключевые слова: дошкольный возраст; сюжетно-ролевая игра; проектная деятельность; социальная компетентность; тревожность; регуляторные функции.

Introduction

In contemporary scientific research, social competence is defined as the general ability to effectively cope with situations of social interaction [5; 40; 44]. One of the most common models for assessing social competence in childhood includes: social competence as the ability to prevent conflict situations and build positive interaction, social anxiety-detachment and social anger-aggression [37; 38]. Preschool age is one of the most intensive periods of social competence formation [7; 29; 52]. An important factor of social development in this period is active communication with peers, in which the child begins to perceive the other as a subject of interaction with his desires, feelings and beliefs [12]. According to research, the level of development of social competence at preschool age is a significant predictor of academic success at school [39; 40], educational motivation [45], cognitive development [8; 22; 41], life satisfaction and mental health in adulthood [15; 32]. However, the analysis of modern childhood shows an increase in children's communication difficulties, as well as an increase in helplessness and aggressive behavior when interacting with peers [5; 10; 11; 27]. This situation is crucial for preschool education where children interact with their peers, build a system of interpersonal relations, which determines the development of their social competence and social well-being. Therefore, the search for ways to develop social competence in preschoolers within the kindergarten is an urgent task of the modern education system.

Role play and project-based learning as tools for the development of social competence in preschoolers

From the point of view of the cultural and historical approach, role play has the most significant impact on mental development in preschool age, including the development of social competence [13; 58]. Research shows that role play is indeed an effective way to develop social skills in preschool age [28; 34; 42; 50]. A.V. Zaporozhets and D.B. Elkonin noted that preschoolers enter into two types of relationships in the role play: "First, children enter into real relationships with each other as partners in the game. ... Secondly, children who play enter into relationships with each other, determined by the roles they have assumed." Choosing a role involves establishing agreements with peers, following the rules and interacting with other players based on role obligations and the game context, resolving inter-role conflicts, achieving common goals, etc. Role play becomes a space for preschoolers where

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they hone their skills of cooperation and conflict resolution, learn to share game materials with other children, and master the social relations of the "adult world".

Project-based learning has become widespread in modern preschool education along with role play. It contributes to the versatile mental development of young children [6; 16; 19; 31]. Project-based learning is a joint activity of an adult and a child, based on the support of independent activity and initiative of a preschooler. There are three main types in it: research, creative and normative [2]. The research project is aimed at finding answers to questions about various phenomena and the causes of their occurrence. The main goal of the creative project is to create a new product. Normative projects, in turn, are aimed at establishing and developing new norms and rules of behavior in a group based on real-life situations and problems that arise in kindergarten. Research shows that project activities contribute to the significant development of social competence of preschoolers [18; 29; 47; 60]. Problem situation that cannot be solved by child on his own requires him to cooperate with other project participants in the process of setting goals, completing intermediate tasks, discussing and making decisions. The presentation of the project's product contributes not only to the development of speaking skills, but also the ability to listen and treat others with respect.

Despite the widespread use of role play and project activities in the practice of preschool institutions, there is extremely little data in the scientific literature reflecting the specifics and comparison of the develop-ment of social competence of preschoolers in these types of activities [9]. Thus, the first research aim of this study was to compare the development of social competence in a story-role-playing game and project activities in order to clarify the specifics and conditions of the organization of these types of activities.

Executive functions and development of social competence.

Social competence is influenced by the wide range of factors, including cognitive processes and behavioral skills of a child. Research and meta-analyses show that cognitive processes, in particular self-regulation, are significant predictors of social competence in preschool age [49; 52; 53]. Therefore, it is necessary to take into account the peculiarities of the development of self-regulation of preschoolers in the formation of social competence. Self—regulation are often considered in the context of executive functions (EF). EF provide purposeful task solving and adaptive behavior in new situations, including situations of social interaction [25]. According to the concept of A. Miyake, basic EF include working memory, cognitive flexibility and deterrent control [43]. In a broader context, EF can be considered as a variety of mental processes that contribute to the purposeful regulation of cognitive processes and are formed by cultural norms, knowledge and values [26]. From the point of view of the cultural and historical approach, EF represent a systematic indicator of higher mental functions [17; 56]. The ability to control one's emotional and behavioral reactions contributes to the successful establishment

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of social relations, therefore, EF are closely linked to the development of social competence, in particular, at preschool age.

Children with a high level of EF are more likely to cooperate with their peers than children with a low level of EF [33]. While children with low EF levels are more aggressive and competitive towards their peers [20; 33]. In addition, high level of inhibitory control is associated with cooperative behavior, joint problem solving tasks and achieving common goals [24; 48]. Inhibitory control allows children to more effectively suppress impulsive, aggressive reactions, which allows them to build a harmonious interaction with a partner. Thus, the level of EF is an important factor of the social competence development.

The connection of EF with the development of social competence reflects the importance of taking this factor into account when forming the social competence of preschool children. Therefore, the second research aim of this study was to analyze the development of social competence in preschoolers with different levels of EF in role play and project-based learning.

The main hypotheses of the study

This study is aimed at comparing the effectiveness of role play and project-based learning for the development of social competence in older preschoolers, including preschoolers with different levels of EF. Taking into account peculiarities of mentioned types of activities [3] and ideas about child development in the cultural-historical approach [4; 7; 12; 13], the following hypotheses were put forward:

1. Reduction of social anxiety and withdrawal in children during the role play will be more significant than in project-based learning. This assumption is related to the unproductiveness of the play and, as a result, the lack of any assessment of the results of the child's activity.

2. Reduction of aggressive behavior in children during the role play will be more significant than in project-based learning. The procedural nature of the play helps preschoolers "throw out" negative emotions, such as anger.

3. The development of children's social competence in project-based learning will be more effective than in role play, since it involves a more accurate orientation of the child in the system of social interactions between project participants.

4. The development of social competence in children with a low level of EF will be more effective when in role play and creative projects than in research projects. This assumption is explained by fewer restrictions on the spontaneous behavior in these types of activity than in research projects.

5. The development of social competence in children with a high level of EF will be more effective when applying research projects. The assumption is based on the fact that children with a high level of self-regulation get the opportunity to express themselves in a situation where they are competent.

Methods

Participants

The pilot study in the 2022-2023 academic year involved 30 preschoolers aged 5-6 years (average age — 5.8 years), among whom 15 boys and 15 girls. All the

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children attended one state kindergarten in the Moscow region. The parents of all the children who took part in the study gave written consent to participate. The study was approved by the Ethics Committee of the Faculty of Psychology of Lomonosov Moscow State University.

Children who attended less than half of the classes (N= 1), children who did not participate in the post-test (N=5) due to illness, absence from kindergarten on the days of the post-test were excluded from the study. Thus, 24 children, including 15 boys (62.5%) and 9 girls (37.5%), were included in the final sample for analysis.

Procedure

The study consisted of three stages. At the first stage the assessment of EF and social competence was carried out. The assessment was carried out individually with each child. After the EF assessment, the children were divided into two subgroups according to the levels of cognitive development (low, high) in accordance with the results of cluster analysis (clustering of K-means) in Jamovi 1.6.23.0.

Further, in the second stage, participants from each subgroup with low and high levels of EF were randomly assigned to three experimental groups: Free Play, Research Project, and Creative Project. At the same time, the ratio of participants with different levels of EF in the groups was equal. Each group had 12 training sessions lasting 20-30 minutes in groups of 10 people. Training was held twice a week in classroom for additional education located at kindergartens. Trainings were completed in all groups at the same time. At the third stage, a post-test similar to the initial assessment was conducted to measure the level of EF and social competence.

Techniques

To assess EF the NEPSY-II subtests [43] adapted for the Russian-speaking sample were used [1]. The "Memory for Designs" subtest for memorizing images and their location was used to evaluate visual working memory. To assess verbal working memory, the "Sentence Repetition" subtest was used to repeat sentences that gradually become more complex lexically and grammatically. The "Naming and Inhibition" subtest was used, aimed at assessing the level of information processing speed and inhibition of cognitive impulsive reactions. The "Statue" subtest was used to evaluate physical inhibitory control. To assess cognitive flexibility the "The Dimensional Change Card Sort" test was used to sort cards by a variable criterion [1; 61].

The questionnaire for educators "Social Competence and Behavior Evaluation (SCBE-30)" was used as a tool for diagnosing social competence [24]. This questionnaire includes three scales: social competence, social anxiety-withdrawal and anger-aggression. Each scale includes 10 statements reflecting the emotional and behavioral characteristics of children. The social competence scale in this questionnaire reflects the child's ability to cooperate and resolve conflicts with peers.

Study groups

Three experimental groups were represented in the study: Free Play, Research project, and Creative project. As part of

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the Free Play, the experimenters helped the children start a role play, for example, organized a discussion about the choice of the theme of the game and the roles, and then did not interfere in the game. The play took place in an environment enriched with non-game materials, such as sticks, cones, boxes, leaves and others.

Research and creative projects were organized as part of the project activities. The normative project was not included in the experiment, since its implementation should be justified by the real situation in the life of the kindergarten group and implies a change in the rules of functioning of this group, the active involvement of the teacher in normative project activities. The described conditions impose significant limitations on the organization of the experiment and the interpretation of the data.

In the Research Project, the experimenters created a problematic situation related to the topic of space. As part of the discussion about space, the children formulated the question "what do you need to know about Mars in order to travel to it?", which was accepted as a specific research task. As part of the discussion, preschoolers proposed to compile a book-note, which will contain all the necessary information for a trip to Mars. In the following classes, the questions and topics that need to be covered in the note book were selected and distributed among the children; information was collected from various sources (books, cartoons, a survey of parents and kindergarten workers); the information received was recorded in the form of pages of a book with drawings; the information collected was evaluated for reliability, importance and personal attitude of

children to it; a cover contest for the book notes was organized; a discussion was held on how to in what order it is necessary to assemble the note book, how it can be finalized and decorated, who will be interested in it; the note book was presented in several kindergarten groups. As part of the classes, the experimenters helped preschoolers organize the stages of work and supported children's initiatives.

In the Creative Project, the experimenters also created a problematic situation related to space, but its key point, as a result of children's discussion, was the creation of a model of space (crafts). In subsequent classes, a competition for sketches of a space model was held; a list of necessary materials and a work plan were compiled; responsibilities were assigned; the direct implementation of the space model took place; its presentation to kindergarten groups. As part of the Creative Project, the experimenters helped preschoolers organize the stages of work, supported the initiative and helped preschoolers in case of operational and technical difficulties (cutting out shapes of complex shapes, sewing a button, etc.).

Results

Descriptive statistics

Children with high and low EF levels were proportionally distributed among experimental groups during the pre-test period, in addition, the proportional distribution of children with different levels of EF remained equal after the post-test ($\chi^2(2)=0.254$, p=0.881, N=24).Gender differences in distribution by experimental groups ($\chi^2(2)=0.0879$, p=0.957, N=24), EF levels in the entire final sample ($\chi^2(1)=0.1688$, p=0.682, N=24),

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Table 1

Distribution of participants by experimental groups and EF levels (N=24)

Group / EF level	Low EF level		High EF level	
Sex	Boys	Girls	Boys	Girls
Free Play	2	2	2	1
Research Project	2	2	2	2
Creative Project	3	1	2	3

EF levels within experimental groups ($\chi^2(5)=0.138$, p=0.927, N=24) were not detected. The data on the sex composition of the groups is shown in Table 1. Sex differences were found on the pre-test for the social competence (Mann-Whitney test, U(1)=28, p=0.013): girls showed higher scores for this parameter. In order to compensate for the sex differences, the sex factor was taken into account and controlled in the further analysis.

At pre-test significant differences were found between the experimental groups in social competence (Kraskel-Wallis test, $\chi^2(2)=6.92$, p=0.031, $\varepsilon^2=0.301$).There were also differences in the "anxiety-withdrawal" for the interaction of group factors and the EF level (Kraskel-Wallis test, $\chi^2(5)=11.8$, p=0.038, $\varepsilon^2=0.513$), but the pairwise comparison did not show significant differences. Therefore, in a further analysis, an assessment of the differences in pre- and post-test scores for the diagnosed parameters was conducted. Descriptive sample statistics for the pre- and post-test period are presented in the table 2 and 3.

Analysis of the effectiveness of role play and project-based learning

In order to assess the effectiveness of role play and project-based learning, nonparametric variance analysis with repeated measurements (Friedman's test), as well as nonparametric variance analysis

Table 2

Descriptive statistics for the pre-test period (N=24)

Parameter/experimental group	Social competence Me±SD		Anxiety-withdrawl Me±SD		Anger-aggression Me±SD	
EF level	Low	High	Low	High	Low	High
Free Play (N=7)	31±4,79	38±10,7	26,5±2,89	15±3,21	11,5±10,2	10±11,4
	32±7,72		23±6,09		11±9,76	
Research Project (N=8)	39±8,04	29±14,2	15±10,4	21±1,83	9,5±6,29	17±11,8
	36±11,9		19,5±7		11,5±9,62	
Creative Project (N=9)	41,5±6,78	44±2,88	17±2,22	15±2,28	13±5,26	9±4,34
	43±4,64		17±2,12		9±4,58	
The Kraskel-Wallis test for experimental groups	$\chi^2(2)=6,92$, p=0,031, $\varepsilon^2=0,301$		$\chi^2(2)=4,5$, p=0,105, $\varepsilon^2=0,196$		$\chi^2(2)=1,03$, p=0,599, $\varepsilon^2=0,045$	
The Kraskel-Wallis tesr for the interaction of experimental group and EF levels	$\chi^2(5)=9,52$, p=0,09, $\varepsilon^2=0,414$		$\chi^2(5)=11,8$, p=0,038, $\varepsilon^2=0,513$		$\chi^2(5)=2,43$, p=0,787, $\varepsilon^2=0,106$	

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of differences between pre- and post-test (analysis of differences in changes in the studied parameters, the Kraskel-Wallis test) were carried out.

Children in all groups showed a significant increase in social competence (Friedman's test, $\chi^2(1)=4.55$, p=0.033). However, no significant differences were found between the experimental groups, as well as children with different levels of EF (Kraskel-Wallis test, p>0.05). There were no differences in social competence changes for boys and girls (Kraskel-Wallis test, $\chi^2(1)=1.56$, p=0.211, $\varepsilon^2=0.068$), at the post-test. Girls showed higher scores for this parameters at post-test (Mann-Whitney test, U(1)=35, p=0.037). The sex differences remained.

Preschoolers in all experimental groups showed a significant decrease in the "anxiety-withdrawal" (Friedman's test, $\chi^2(1)=13.8$, p<0.001). At the same time, the decrease in anxiety was significantly different depending on the interaction of the experimental group and the EF level (Kraskel-Wallis test, $\chi^2(5)=12.7$, p=0.026,

$\varepsilon^2=0.553$), pairwise comparison did not reveal significant differences (Post Hoc, p>0.05). Separately, the influence of the group factor (Kraskel-Wallis criterion, $\chi^2(2)=1.23$, p=0.539, $\varepsilon^2=0.0537$) and the EF factor (Kraskel-Wallis test, $\chi^2(1)=0.716$, p=0.397, $\varepsilon^2=0.0311$) was not detected. At the same time, the initial differences in the "anxiety-withdrawal" indicator for the interaction of group and the EF level were leveled (the Kraskel-Wallis criterion, $\chi^2(5)=8.61$, p=0.126, $\varepsilon^2=0.374$). Children with low EF levels showed the greatest decrease in anxiety during Free Play (Me=-8, SD=1.91), while children with high EF levels showed the greatest decrease in Research Project (Me=-5, SD=2.22). The data is more clearly reflected in the Figure 1. No significant changes were found for the anger-aggression.

Discussion

The main purpose of this study was to compare the effectiveness of role play and project-based learning for the development

Table 3

Descriptive statistics for the post-test period (N=24)

Parameter/experimental group	Social competence Me±SD		Anxiety-withdrawl Me±SD		Anger-aggression Me±SD	
EF level	Low	High	Low	High	Low	High
Free Play (N=7)	38,5±9	39±7,55	19±2,94	16±2,65	15±7,3	9±5,51
	39±8,04		17±3,35		11±6,32	
Research Project (N=8)	39±3,56	38,5±6,78	12±12,2	16±2,99	10±4,79	14±5,2
	38,5±5,45		14±8,29		11,5±4,94	
Creative Project (N=9)	46,5±2,89	45±5,45	11,5±2,16	14±2,70	14±6,38	8±4,87
	46±4,29		12±2,47		9±5,41	
The Kraskel-Wallis test for experimental groups	$\chi^2(2)=8,77$, p=0,012, $\varepsilon^2=0,381$		$\chi^2(2)=5,92$, p=0,052, $\varepsilon^2=0,257$		$\chi^2(2)=0,131$, p=0,937, $\varepsilon^2=0,006$	
The Kraskel-Wallis tesr for the interaction of experimental group and EF levels	$\chi^2(5)=9,52$, p=0,09, $\varepsilon^2=0,414$		$\chi^2(5)=8,61$, p=0,126, $\varepsilon^2=0,374$		$\chi^2(5)=2,59$, p=0,764, $\varepsilon^2=0,112$	

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of social competence in older preschoolers. The results showed that both free role play and project-based learning contribute to reducing social anxiety and promoting social competence in children. However, children with lower levels of EF demonstrated the greatest improvement in social competence through free role play, while children with higher levels of EF improved more through project-based learning. There were no significant changes in social aggression levels before and after the classes. It was found that girls had a higher level of social competence at the pre-test compared to boys. The initial sex difference in the level of social competence was not leveled after classes. These sex differences in social competence were consistent with other studies that found a higher level of social development among girls at preschool age. This may be due to differences in their upbringing and playing preferences [14; 54].

Preschoolers who participated in role play and project activities showed a similar decrease in the level of social anxiety, but the results also indicated different grounds for their orientation in educational activities in kindergartens. These grounds seem to be related to the EF level. Children with a low level of regulation may experience difficulties in social interactions due to their inability to control aggressive and impulsive reactions [20; 33]. This can lead to deficits in interpersonal relationships, as other children may not want to interact with them. However, within the context of play, preschoolers with low EF levels are able to better control their behavior [4]. This suggests that play can be an effective tool for helping children with these difficulties. Role play helps children with a low

level of self-regulation to successfully cope with social situations, as it involves interacting from a role in an imaginary context. Role and the associated rules allow the child to act independently, relying on the imaginary situation's semantic space, which makes it easier to follow the game's plot and brings more pleasure than impulsively acting on desires [4; 13]. In a safe play environment, a child can display various behaviors. Thus, role play becomes a space where a children with low self-regulation finds success, including in social interactions, which can significantly reduce their social anxiety [50; 51. The process of playing is more important than the outcome. In addition, role play involves the active use of symbolic means, which are most accessible to preschool children. Studies have shown that these means are most effective for children with low levels of EF [57]. The results suggest the possibility of using role play as a method for reducing childhood anxiety. This is consistent with research on the psychotherapeutic function of play [23; 59] and complements it, clarifying the specific aspects of the development of preschoolers with different levels of EF in play.

At the same time, children with a high level of self-regulation showed the greatest reduction in social anxiety in research project. Preschool children with a high EF level focus on recognizing their own productivity, which is possible through research project activities. Project activity, on the one hand, creates conditions for successful communication between children and peers, providing opportunities for the realization of their own ideas. Children can be heard in this process. On the other hand, research projects have a special role, as they allow

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children to work individually to a greater extent, and the results of their work can be more accurately presented.

The results of the study demonstrated the development of social competence among preschoolers through play and project-based learning. The findings are consistent with prior research on the impact of these activities on the ability to treat others with respect, work in teams, present oneself effectively, and demonstrate tolerance [18, 28, 29, 34]. Additionally, the findings clarify the outcomes of previous research by demonstrating that an integral aspect of a child's social development (social competence) can be fostered through play and project work. However, while processing the data, specific details and variations in children's development within these activities were not identified. The hypotheses regarding changes in social anxiety, aggression, and competence due to play and project-based learning were not supported. Nevertheless, it is important to consider the short duration of the interventions in this study. The classes lasted for 6 weeks. Considering that the manifestation and development of social competence depend on various factors, such as the physical condition of the child, family relationships, stressful events, and others [40; 44], this period could be sufficient for the development of some social skills and an increase in interactions with peers. However, it is not sufficient to see the specific impact of role play and project activities on social competence development.

The main limitation of this study is the lack of a control group, which prevents us from reliably assessing the effectiveness of role play and project-based learning in the development of social competence compared to the natural development of children. Although the main aim of the study was to compare these two types of activities, data from other studies using a control group suggests that both activities significantly contribute to the development of specific social skills in preschoolers. Additionally, the duration of the experiment (6 weeks) may not be sufficient for the full manifestation of natural social competence development in preschoolers, as it is a complex process involving various behavioral patterns. Furthermore, the small sample size limits the generalizability of the findings, making it difficult to draw definitive conclusions about the effectiveness of these activities. Nevertheless, the study provides valuable insights into trends in the relationship between these activities and social competence development.

Conclusion

The study found that role play and project-based learning contribute to the development of social competence in preschoolers. For children with low levels of EF, role play was more effective in reducing social anxiety compared to project-based learning, while for those with high FF, participating in a research project helped them better manage social anxiety. These findings clarify and expand our understanding of how role play and project activities can be used in kindergarten settings to support the development of different groups of preschoolers, and open up opportunities for further research on the impact of these activities on other aspects of children's mental development.

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— PSYCHOLOGY OF EDUCATION | ПСИХОЛОГИЯ ОБРАЗОВАНИЯ —

Methodological Foundations for the Formation of Universal Educational Actions in the Context of the Ideas of the V.S. Mukhina's Concept "Phenomenology of Personality Development and Being"

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The article considers the methodological foundations for the formation of universal educational actions as the basis for the creation of metasubject results of general secondary education. It examines the key ideas of cultural-historical and system-activity approaches that are fundamental in achieving the main results of school education. The authors substantiate the importance of implementing these ideas at the level of federal state educational standards in order to systematize, standardize and regulate the activities of teachers in a modern school. The article also reveals the interrelation of the currently existing methodology for the formation of universal educational actions with the ideas of the concept of the V.S. Mukhina's scientific school "Phenomenology of personality development and being". Here's also substantiated the productivity of considering V.S. Mukhina's scientific ideas on the mental mechanisms of identification-isolation and factors determining the development of the personality, including: 1 — genotypic prerequisites, as methodological foundations for the formation of cognitive, communicative and regulatory universal educational actions; 2 — external conditions (the reality of the objective world, the reality of figurative and symbolic systems, natural reality, the reality of the socio-normative space); 3 — the internal position of the personality. The authors consider the interrelation of personal educational outcomes with universal educational activities as well. They also defend the idea that the prior purpose of education is personal development.

Keywords: universal educational actions; metasubject results of education; cultural-historical approach; system-activity approach; mechanisms of identification and isolation; prerequisites for development; realities of being; the reality of the objective world; the reality of figurative-sign systems; natural reality; the reality of socio-normative space; the inner position of the personality.

Методологические основания формирования универсальных учебных действий в контексте идей концепции «Феноменология развития и бытия личности» В.С. Мухиной

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Обсуждаются вопросы методологии формирования универсальных учебных действий (далее — УУД) как основы формирования метапредметных результатов общего образования. Рассматриваются ключевые идеи культурно-исторического и системно-деятельностного подходов, являющихся основополагающими в достижении основных результатов школьного обучения. Обосновывается значение реализации этих идей на уровне федеральных государственных образовательных стандартов с целью систематизации, стандартизации и регламентации деятельности педагогов. Раскрывается взаимосвязь ныне существующей методологии формирования УУД с идеями концепции личности В.С. Мухиной. Обосновывается продуктивность рассмотрения в качестве методологии формирования УУД идей В.С. Мухиной о психических механизмах идентификации-обособления и факторах, определяющих развитие личности: 1 — генотипические предпосылки; 2 — внешние условия (реальность предметного мира, реальность образно-знаковых систем, природная реальность, реальность социально-нормативного пространства); 3 — внутренняя позиция личности. Рассматривается взаимосвязь личностных результатов образования с УУД. Отстаивается идея о том, что цель образования — это развитие личности.

Ключевые слова: универсальные учебные действия (УУД); метапредметные результаты образования; культурно-исторический подход; системно-деятельностный подход; механизмы идентификации-обособления; предпосылки развития; реалии бытия; реальность предметного мира; реальность образно-знаковых систем; природная реальность; реальность социально-нормативного пространства; внутренняя позиция личности.

In the modern information society with rapidly developing technologies and the frequent loss of relevance of previously acquired knowledge, paying attention to digital literacy is of particular importance [7, p. 126-128] as well as to the ability to learn independently, selectively assimilating information and mastering knowledge, educational skills and skills that are significant here and now, which requires developed self-regulation, interrelated with involvement in educational activities [30], and productive interaction with other people, going beyond the classroom system [13], including a reflexive component [28] and empathy as a factor of psychological security of the individual [1]. Therefore, the problem of the formation of universal educational actions (hereinafter referred to as UEA) of students is of particular importance for the Russian education system, which finds its embodiment in federal state educational standards at all levels of general education and requires their systematic further improvement, including at the level of higher education, since "the study of UEA is not only among schoolchildren, but also and students are an urgent task of contemporary psychological science" [18, p. 24].

Nowadays in the Russian Federation, the cultural-historical system-activity approach proposed by Academician A.G. Asmolov and his development team [15], based on the ideas of the outstanding Russian psychologist L.S. Vygotsky, his students and followers, which are supported by modern foreign researchers and practitioners in the field of psychology of education, is used as the theoretical and methodological foundations for the formation of UEA [33; 34; 35; 36; 37], despite the lack of a common understanding of cultural and historical theory abroad as a result of the limited availability of many works by L.S. Vygotsky for historical reasons [38]. Let's define these ideas further.

L.S. Vygotsky in his theory justified the cultural and historical nature of the human psyche and considered its development as a process of appropriation of the experience of all previous generations, in which special attention is paid to the learning process leading to the development of the psyche and personality through the creation of zones of proximal development and transition from natural mental functions to higher ones [11], where a special role is assigned to the teacher as an intermediary between culture and the inner world of the child [4].

Following L.S. Vygotsky, A.N. Leontiev emphasized on the special importance of the mental mechanism of the interiorization of socio-cultural experience through activity as a driving force for cognitive development and the development of the psyche as a whole [16]. He highlighted the universal structure of any activity, including educational, indicating the key importance of the motivational and semantic sphere of personality for successful learning and development.

P.Ya. Galperin supplemented the domestic developments of the theory of activity by proposing the concept of step-by-step formation of mental actions of a student, where he assigned special importance to orientation as a process of analyzing a situation, including a system of set conditions and ways to identify an indicative basis in them, which the success of any human activity depends on [12].

D.B. Elkonin proposed an age-related periodization of development based on the

idea of leading activity, which has its own characteristics at each ontogenetic period and is determined by the interdependence and unity of the formation of operational, technical, motivational and semantic spheres of personality [32]. This allowed him to work with V.V. Davydov developed a concept of developmental learning based on the priority of forming theoretical thinking as an understanding of cause-effect relationships and relationships of the studied phenomena through the formation of analytical abilities, mastering the logic of scientific cognition based on the principle "from abstract to concrete" [14], where the development of reflexive and communicative abilities of a student in the educational community acquires special importance [27]. A.G. Asmolov, emphasizing the importance of the development of semantic consciousness and the acquisition of personal meanings as a result of activity, writes about the importance of semantic learning already in elementary school, aimed at forming an active life position of the student, which is based on professional and personal self-determination, independent cognitive activity and the need for knowledge [15]. The discussed ideas of L.S. Vygotsky, his students and followers allowed A.G. Asmolov and a group of scientists and methodologists led by him to formulate the key methodological positions of the concept of the development of UEA in the general education system [15]: 1 — the need to consider UEA in the context of the main structural components of educational activity (motives, goals, tasks, actions and operations) for their formation, evaluation and control; 2 — the derivation and dependence of knowledge, skills and abilities on the management system and the development of the ability to learn independently: the ability to self-development and self-improvement through appropriation of the cultural and historical experience of mankind; formation of motivation for learning, cognition and creativity; development of independence, initiative and responsibility

for their development and interaction with other people; 3 — the need to take into account the age-related features of the development of the psyche at different stages of ontogenesis for the productive realization of the continuity of the stages of education and a smooth transition from the joint activity of the student and the teacher to jointly separate and further to independent activities aimed at self-education and self-upbringing.

N.F. Vinogradova, developing didactic support for the learning process in primary school, also highlights the importance of the ideas of L.S. Vygotsky's cultural and historical theory and A.N. Leontiev's and his followers' theory of activity to achieve metasubject results in the formation of UEA, saying: 1 — about the importance of environmental conformity (taking into account the needs, inclinations, capabilities and abilities in the context of the psychological characteristics of the student's age) and environmental friendliness (including knowledge, skills and abilities acquired in the learning process in the life context of the child, his daily existence) of the organization the learning process [9]; 2 — about the need for the student to master new educational roles ("observer", "researcher", "critic", "opponent"), which he will later be able to transfer into his public life; 3 — about the special importance in developing the ability to learn of such mental processes as thinking (the ability to think independently, explore, experiment that is, to independently dispose of the acquired knowledge) and imagination (the ability to foresee the development of phenomena and events); 4 — about the importance of developing a student's understanding of the differences between practical (what to do?) and educational (how to do it?) tasks; 5 — about the need to form a readiness for self-education already in elementary school as the ability to consciously arbitrarily assign cultural and historical experience and use it both in educational situations and situations of everyday life [8].

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The methodological ideas discussed are widely known in the academic psychological and pedagogical community. However, until recently, and in some cases still, these ideas, when implemented in practice at all levels of school education, often had a situational unsystematic character, due to the peculiarities of the teacher's psychological and pedagogical competencies and his personal motivation to use the ideas of cultural-historical theory and a system-activity approach in organizing the educational process [6], despite their empirically proven productivity [10]. The development of new federal educational standards for primary general and basic general education based on the productive ideas of Russian psychological thought is designed to systematize, standardize, regulate and make their use mandatory in the educational practice of primary and secondary schools [5]. This has already made it possible to determine the essence of UEA (cognitive, communicative and regulatory), as well as to specify their content and characteristics [29]: 1 — cognitive UEA are characterized by three actions — basic logical, basic research and work with information (clause 43.1); 2 — communicative UEA include two actions — communication and joint activity (clause 43.2); 3 — regulatory management is carried out through the action of self-organization and self-control (clause 43.3).

At the same time, it should be noted that the achievements of Russian psychological thought, significant for the methodology of the formation of UEA, are not limited to the cultural-historical system-activity approach. For the productive modernization of the education system in the Russian Federation, aimed at the formation of a student who is able to study independently and work with information, engage in constructive interaction with others, which is closely interrelated with motivation to acquire knowledge (including in children with mental retardation [2]), who has the skills of goal-setting, self-organization, self-control, planning, which presupposes the formation of knowledge about time in self-consciousness [31], it is important to refer to the legacy of other fundamental domestic psychological theories, capable of qualitatively complementing the approaches discussed.

In the context of the development of the theory of the formation of UEA, we consider it important to consider the provisions of the concept of the scientific school "Phenomenology of personality development and being" by Academician of the Russian Academy of Sciences, Doctor of Psychological Sciences, Professor V.S. Mukhina, in which she focuses on the development of an integral personality and its self-awareness. The scientist defends the idea that "the man exists in two inherent hypostases: as a social unit and as a unique personality capable of solving problematic situations independently" [23, p. 242]. A person as a social unit embodies the cultural and historical essence of humanity, appropriating the experience of previous generations in the context of historically developed features of thinking, communication and regulation of their own behavior. As a person, he is "able to go beyond any limitations, realizing and finding in himself the need for development. To do this, a person organizes his will, acting as a conscious and purposeful being" [23, pp. 242-243]. The successful formation of UEA is not just the appropriation of historically established ways of thinking, communication and regulation, but also the actualization of the need for self-development through a value attitude towards oneself.

When forming a UEA, it is necessary to understand and take into account the mechanisms of the development of the psyche and personality. V.S. Mukhina considers the mechanisms of identification-isolation in their dialectical unity as fundamental [24], defining identification as "a mechanism for assigning a comprehensive human essence to an individual" [20, p. 100], and isolation as "a mechanism for defending an individual his natural human and personal essence" [20, p. 101].

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In the context of the formation of cognitive skills, identification ensures the appropriation of the knowledge of another, in turn, isolation allows you to give the knowledge of another a personal meaning when this knowledge becomes truly your own. It is important to understand that the first one provides the opportunity to learn mental operations, and through isolation, concentration and independent use of mental operations develop (you can imitate an action, or you can imitate the result of an action).

When forming cognitive skills, it is important to maintain a balance of identification-isolation mechanisms: the student must not only reproduce the acquired knowledge, but also navigate, make independent decisions through problematic situations and encourage reflection by the teacher.

In the context of the formation of communicative UEA, identification provides sensitivity to others both through interiorization identification (introjection), involving appropriation and feeling into another (understanding, respect, decentralization, etc.), and through exteriorization identification (projection), involving the transfer of one's feelings and motives to another [21]. Isolation ensures the preservation of oneself and one's personality in communication through emotional reflection on oneself and others, through defending one's status, one's position, one's attitude, through the ability to express one's thoughts and defend one's opinion, taking responsibility for it.

When forming communicative skills, it is also important to maintain a balance of identification-isolation mechanisms: the student must learn to hear others and cooperate without losing himself as a person (without conformism or social coldness).

In the formation of regulatory UEA, identification provides the ability and willingness to obey, orientation to a pattern and rules, reflection on another and acceptance of his assessment for further building his own behavior. Isolation, in turn, ensures the formation of arbitrariness, will and self-control, the development of self-reflection, self-esteem and understanding of the assessment of another in order to take responsibility for their actions and their correction.

When forming regulatory UEA, it is also important to maintain a balance of identification-isolation mechanisms, assuming a student's reflexive orientation to the rules and personal responsibility for organizing their learning and development (without uncritical reactive adherence to a given normativity or negativism as blind resistance to any external influence).

Apart from the mechanisms of identification and isolation, for the formation of UEA, it is necessary to take into account the factors determining the development of the psyche and personality, which V.S. Mukhina highlights in his concept: 1 — *prerequisites for development* (genotype as biologically and historically determined evolutionary properties of a person, his energy potential) [23, pp. 320-369]; 2 — external social conditions (classified to scientists as: *the reality of the objective world, the reality of figurative-sign systems, natural reality, the reality of socio-normative space*) [23, pp. 49-315]; 3 — *the internal position of the personality*, "manifested in independence, activity, as well as in claims to social recognition: recognition by others and recognition in their own eyes" [23, p. 564].

The problem of prerequisites for development is revealed through the unique property of the human psyche to appropriate the cultural and historical experience of mankind, without which it is impossible to develop higher mental functions that ensure cognitive, communicative and regulatory actions of the student, their meaningfulness and independence. In addition, the preconditions for the development of the psyche and personality are interrelated with the principle of natural conformity of education and upbringing, which requires taking into account *the age-related features of the development of the child's psyche and self-awareness* at each stage of onto-

genesis, the specifics of which are revealed by V.S. Mukhina in her age periodization [20, p. 564].

Each of the realities of being and the development of the psyche and personality, highlighted by V.S. Mukhina, reflects the specifics of the formation of three types of UEA.

Thus, *the reality of the objective world* in the context of the formation of: a) cognitive UEA largely determines the development of visually effective thinking, knowledge, skills and skills of using objects in everyday life; b) communicative UEA is interconnected with the problems of using tools and other man-made objects in joint activities, a historically established system of relations to the subject, mediated communication "man—thing—man" [23, p. 57]; c) regulatory management is interrelated with the problems of consumer culture, value attitude to the material heritage of mankind.

The reality of figurative-sign systems in the context of the formation of: a) cognitive UEA determines the development of visual-figurative and especially abstract theoretical thinking, as well as skills in structuring knowledge, building speech, semantic reading and filtering information, its modeling and coding; b) communicative UEA can be considered through the culture of speech and language as an instrument of communication, understanding, building relationships with other people; c) regulatory UEA is interrelated with the problem of the sign function of consciousness and the regulatory function of speech, which determine the organization and control of human behavior.

Natural reality in the context of the formation of: a) cognitive UEA contributes to the formation of a natural scientific picture of the world, develops ecological self-awareness; b) communicative UEA is revealed through the anthropomorphizing of nature by building a value attitude to it in interaction with other people; c) regulatory UEA is interconnected with the problem of developing awareness and self-control through the development of skills of contemplation of nature, harmonizing emotional states and the inner world of the personality.

The reality of the socio-normative space in the context of the formation of: a) cognitive UEA is interconnected with the problems of the normative foundations of cognitive activity, the application of knowledge in relationships with other people; b) communicative UEA is revealed through norms and rules of interaction, a system of rights and obligations, ethnic, confessional, political and other socio-cultural contexts of interaction, as well as ways of defending yourself in communication; c) regulatory management is aimed at the formation of duty, the development of obedience skills, mastering the norms of educational activity, the development of reflection on oneself and others, assessment, self-control and correction of behavior in accordance with the norms accepted in society and the personal ambitions of the student.

Mastering the UEA makes it possible to independently and meaningfully interact with *the Great ideofield of public self-awareness* (the concept was introduced into science by V.S. Mukhina) — the space of "images, sign systems, concepts, ideas, knowledge, concepts that reflect the path of achievements and misconceptions of human cognition and determine the further development of new ideas, which in turn determine the achievements of philosophy, sciences, cultures, morals, technology and politics" [22, p. 28], which includes all the realities of being in its symbolic expression and which is an indispensable condition for further self-education, self-education and self-development of the individual.

The realities of being as a factor in the development of the psyche and personality are interrelated with the principle of *ecological knowledge* (including it in a personal life context) and the problem of *an indicative basis for action* (a comprehensive analysis of a given situation). This relationship in the process of formation of the UEA can be realized through consideration of educational

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material in the context of all four realities of being, highlighted by V.S. Mukhina, allowing purposefully transform and develop the student's own spontaneous ideas to the level of scientific concepts [17]. For example, in elementary school, in the discipline "Environmental world", when passing the topic "Pets", it can be considered in the context of: 1 — the subject world — what subjects people learned to produce with the help of pets (dairy products, fur, etc.) and how they use in everyday life; 2 — figurative and iconic systems — how people capture and describe pets in visual arts and literature, what meanings these images carry; 3 — natural reality — consideration of pets as living beings, part of the natural world and ecology with their biological and evolutionary characteristics; 4 — reality of the socio-normative space — ethical attitude and features of legal interaction of people with pets.

V.S. Mukhina emphasizes the ambivalence of all four realities of being and the development of the psyche and personality, which simultaneously carry both positive achievements of the cultural and historical development of mankind and negative formations that deform and destroy the personality in us [19, p. 19]. This ambivalence can become the basis for student reflection and modeling of problematic situations in the educational process, forming cognitive (critical thinking), communicative (discussion and defending one's position in communication) and regulatory UEA (self-assessment and acceptance of personal responsibility).

The third factor determining the development and existence of the psyche and personality, which V.S. Mukhina highlights, emphasizing its special importance, is *the inner position of the personality* as "a special attitude to the world, at the same time a responsible and valuable attitude of a person to other people, to himself, to his own life path and to life in general" [23, p. 913].

It is obvious that the problem of the internal position of the individual is most closely interrelated with the personal results of the formation of federal state educational standards [3], in particular the formation of civic identity [25]. However, it should be understood that UEA is "a set of ways of action of a student, as well as related learning skills that ensure his ability to independently acquire new knowledge and skills, including the organization of this process" [26, p. 39], are impossible without self-awareness and presuppose purposeful intentional transformative activity inherent in a person on a personal level. Therefore, the internal position of the individual can be considered as one of the key connecting factors between the UEA and the personal results of education in the context of such problems as the active research position of the student, his self-development and self-improvement, responsibility for self-education, meaningfulness and value attitude to education and self-education, personal acceptance of educational roles and implementation in action.

The internal position of a personality in the context of the formation of cognitive UEA is interrelated with such problems as the position of a researcher, educational motivation, reflection on cognitive problems and ways to solve them, and value attitude to cognition in general.

In the context of the formation of communicative UEA, the internal position of a person is interconnected with such problems as taking into account the position of a partner in communication and activity and defending one's position, valuing the other in joint activities and building productive meaningful relationships.

The internal position of a personality in the context of the formation of regulatory UEA is interrelated with the problems of the formation of the position of a personality taking responsibility for self-education and self-development, self-reflection, providing self-esteem, control and correction of their actions, value attitude towards themselves as a student and as a person.

Awareness, self-reflection, value attitude and *correlation of knowledge* with oneself, with other people, with the whole world are a prerequisite for self-education and self-education of a person as a person, the development of his worldview and self-awareness through independent and meaningful appropriation of the cultural and historical experience of mankind.

One of the key goals of education is *the development of the student's personality*.

UEA not only provide the ability to learn, yet also are tools for *building yourself as a person* who takes responsibility for your life path, for other people, for the country and the whole world, which is a common home for all of us. Therefore, we consider the ideas of the concept of "Phenomenology of personality development and being" by V.S. Mukhina to be productive as the methodological foundations for the formation of a student's UEA.

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Changes in the Content and Structure of Students'Life Projects in the Educational Reflexive Dialogue

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This article discusses the problem of developing new teaching methods that are based on the use of reflexive technologies. One of the key components of these technologies is systemic reflection as a condition for the realization of personal potential. The paper contains a brief overview of theoretical, method-ological and applied developments in the studyingofthe reflection in Russian psychological science, which serve as a theoretical basis for the development of reflexology. Thestudy describes main conditions for establishing a reflexive dialogue, the principles of its construction, the necessary structural compo-nents and a summary of the author's development — the reflexive training "Life project of the individual". The author's development, refletrening "Life project of personality", contains a description of the basic conditions of its organization, the principles of its construction and the necessary structural components. The results of an empirical study of the influence of educational reflexive dialogue on the formation of students' life projects are presented. The use of reflexive practices (reflexive training) in reflexive dialogue for building life projects in adolescents is also justified. It has been empirically proved that changes in the structure and content of life projects are noted equally in all subjects, regardless of their personal characteristics, but more likely in students with high scores on such personal characteristics as orientation in time (understanding the existen-tial value of life), creative attitude to life (creativity), self-actualization, contact, systemic reflection, volitional regulation of behavior (control-naturalness), the level of general reflexivity, the appropriation of socially significant roles, the availability of experiences, openness to new experiences and self-assessment of metacognitive activity.

*Keywords:*reflexive dialogue; reflexive learning technologies; model of system reflection; meta-Self; reflexive training.

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Изменения в содержании и структуре жизненных проектов учащихся в обучающем рефлексивном диалоге

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В данной статье рассмотрена проблема разработки новых методов обучения, которые основаны на использовании рефлексивных технологий. В работе приводится краткий обзор теоретико-методологических и прикладных разработок в области изучения феномена рефлексии в отечественной психологической науке, которые служат теоретической основой для разработки обучающего рефлексивного диалога. Описаны основные условия организации рефлексивного диалога, принципы его построения, необходимые структурные компоненты и краткое содержание авторской разработки —программы развивающих занятий на основе обучающего рефлексивного диалога «Жизненный проект личности». Программа содержит описание основных условий его организации, принципы построения и необходимые структурные компоненты. Представлены результаты экспериментального исследования влияния обучающего рефлексивного диалога на формирование жизненных проектов учащихся. Установлено, что изменение в структуре и содержании жизненных проектов отмечается в равной степени у всех испытуемых, вне зависимости от их личностных характеристик. Доказана воспроизводимость эффекта от примененной технологии, основанной на обучающем рефлексивном диалоге.

Ключевые слова: жизненный проект; рефлексивный диалог; рефлексивные технологии обучения; модель системной рефлексии; мета-Я.

Introduction

Difficult economic conditions and a volatile social environment require people to take a conscious approach to their lives. At the present stage of the development of society, it is necessary not only to be aware of what is happening in the present and to design the future, but also to become the authors of one's own life. A person should design his future, taking into account personal needs and the needs of society. This circumstance poses new theoretical and methodological tasks for psychological science, namely: what is life design, what components are included in it, what is its content part, etc. This is especially important for students who are at the stage of forming their personal and professional

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path. In this study, we will consider the role of reflective dialogue in the process of forming students' life projects.

The study of life design begins with works in the field of existential psychology, where R. May, M. Boss and other researchers presented their ideas. Also an important contribution to this field is the life creation of N.A. Berdyaev and the studies of the life path conducted by P. Janet, S. Buhler, S.L. Rubinstein, D.A. Leontiev, B.G. Ananyev, N.A. Loginova. In addition, K.A. Abulkhanova-Slavskaya, V.G. Aseev, Y.V. Vasiliev, E.I. Golovakha and other researchers studied the life perspective [4, 10]. All these studies are united by an interest in understanding how each individual perceives the time and space of his life, in what forms they exist and how they manifest themselves. It is also important to study the factors influencing the change in the content of life, as well as the peculiarities of perception of the future, foresight of events and the role of ideas about the future in the structure of the subjective picture of human life. All this is directly related to the process of designing a person's life.

In Russian psychology, there is a fairly small number of studies that are related to the study of the concept of "a person's life project".

Life design and life perspective are two concepts that are often considered by the authors as synonyms, denoting a subjective vision of the future of a person. In V.S. Yurkevich's research on the effectiveness of psychological and pedagogical work with gifted children, the "dominant life project" is considered as "an innovative educational technology that includes a set of diagnostic and formative techniques" [27]. These techniques are aimed at realizing and implementing personal and professional plans that contribute to the development of the personality of a gifted child. A larger definition of the design of life is given in the research of M.V. Klementyeva and E.E. Sapogova. Here, the individual future of a personality is considered through the concepts of "self-projection" and "life project of a personality". According to E.E. Sapogova, self-design and personal self-building include defining one's own values and meanings, forecasting goals, developing life strategies and planning the implementation of various forms of behavior. She notes that a person creates meanings and symbols that give meaning to his existence. At the same time, it takes into account general cultural guidelines, meanings and meanings that have already been accepted and verified by other people. Thus, meaning becomes the result of the creative process in life [19].

Life planning and life perspective are important aspects of personal development. According to the theory of M.V. Klementyeva and N.A. Chueva, life design is nothing more than a complex process that includes the formation of various types of life projects: event-based, aimed at changing personal characteristics and existential. The researchers emphasize that, despite the fact that the general concept of a life project unites all three types of projects, the degree of their development and application can vary significantly depending on the age period. Thus, in adolescence, an event project can most often be observed, which is complemented by elements of an existential and personal characteristics project. In adolescence, all three types of projects begin to manifest themselves more clearly, and in adulthood, a full-fledged, comprehensive life project is formed [9].

In foreign psychological science, the concept of a "life project of a personality" is considered to a greater extent within the framework of practical research.

In particular, the concept of "life project" is mentioned in works related to the study of determinants and protective factors

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against such behavioral destructions in adolescents as pregnancy, depression, suicide, etc. (Baeza W. B., Póo A.M., Oman R.F., Vesely S. K., Harris L., Phipps M., Ramirez -Aranda J.M et al.). Oman R.F., Vesely S. K., Aspy C. B. (2005) consider life projections as "future aspirations" without disclosing this definition [30]. According to research by Baeza W. B. et al (2007), "the creation of a life project in adolescents is one of the protective factors of personality against antisocial behaviors" [20].

In our research, we relied on the subjective-activity approach (S. L. Rubinstein et al.); the theory of the life path and the psychological concept of personality research as a subject of life (B.G. Ananyev, K.A. Abulkhanova-Slavskaya, M.R. Ginzburg, V.I. Kovalev, T.N. Berezina, A.N. Leontiev, S.L. Rubinstein et al.).

In our study, a life project is understood as an event project, a project for the development of personal properties (an existential project according to E.E. Sapogova) [20]. It is important to note that there are different stages and forms of life design. At the same time, it is in adolescence that a teenager learns to consider his life as an event in which I and Others are present. From our point of view, the "life project of a personality" is a vector of the "future" that a person creates for his own life, perceived by him as favorable and dynamic. The substantial part of a person's life project can be described through the spatial and temporal components of human life activity.

The development of modern educational activities is conditioned by the value reorientation of society, which led to the emergence of a new trend — personal and semantic pedagogy. At the present stage of the development of pedagogical and psychological practice, there is a constant interest in the study of reflection. Along with theoretical research, there is a need to develop practical methods — reflective learning technologies that will help unlock personal potential. Actualization of reflection is not automatic even for people who are prone to reflexivity and self-distancing. Many researchers note that the probability of achieving it is more likely to occur only in conditions of reflexive learning. This was confirmed by the works of N.G. Anikanov, S.V. Krivykh, P.I. Tretyakov, and others [11,14,20].

In modern Russian psychology, the most meaningful practical developments in the field of reflection are carried out within the framework of the system-activity approach (V.A. Lefevre, A.V. Lepsky, A.A. Tyukov, G.P. Shchedrovitsky, etc.), as well as the praxiological concept of reflection (Semenov, Stepanov and others). This is due to the fact that these approaches are most fully developed in relation to the structural and process components of reflection, providing a basis for the creation of practice-oriented methods [1,5,8,12,21,26]. At the same time, questions remain unresolved about the role and influence of the "I-center" ("I-existential", "meta-I") on the course of the reflexive process, what are the features of the manifestation of its activity during reflection, where the topos of reflection is located "in the subjective being of the personality" (V.G. Anikina). Addressing the potential and integrating differential (D.A. Leontiev et al.) modal-differential (T. E. Sizikova) and cultural-dialogic (V.G. Anikina) approaches can lead to the identification of new aspects and prospects for the development of effective specific reflexive practices. According to our point of view, these aspects can help resolve these issues [2,3,12,20].

In contrast to research conducted in the context of a systematic approach to activity, where consciousness is functionally transformed into automatic reactions that work according to certain patterns (Vygotsky, 1983; Mamardashvili, 1990, etc.), D.A. Leontiev calls consciousness the basis of a

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unique type of psychological work. Its inclusion in the study model entails, as it were, a doubling of psychological reality [13]. Such a "doubling" is noticeable in all areas of human mental being, be it emotions, motives, states, behavioral tendencies, dispositions, and so on. The essence of the text boils down to the following: reflexive consciousness is a key factor from which an individual's attitude to one's own motives and the degree of their acceptance arise. It also places in us the obligation to acknowledge responsibility for these motives that influence our actions. A reflexive superstructure appears, which elementary affects the functioning of other mechanisms. This mechanism has its own characteristic, defined by the author as optional. It reflects the existence of the potential of this mechanism, but not its mandatory presence for each individual, and all this exists outside of the relationship with the primary "natural" machinery of our existence.

Self-knowledge and work with the inner world become possible thanks to systemic reflection, which is considered the most voluminous and useful compared to other types. D.A. Leontiev argues that the basis of systemic reflection is the disidentification of the "I" into the self-image (I am the concept) and the inner center (I am the existential). This allows a person to see the interaction situation in all its aspects, including the pole of the subject, the pole of the object and alternative possibilities. Thus, systemic reflection allows a person to discover new qualities of himself and becomes the basis for self-knowledge and further work with the inner world [13].

The essence of V.G. Anikina's concept is that reflection is a way of human existence, which is closely related to the formation of a new holistic view of reality. It does not matter whether this reality is internal or external, material or ideal. The specificity of this method consists in separating reality from common connections and considering it from a reflexive position, which is a kind of "Other". Thanks to this position, it is possible to discover the hidden and unmanifested properties and relationships of this reality. The dialogue between the "I" and the reflexive position (the Other) leads to redundancy, which transforms already known concepts and becomes a source of new knowledge about the reality being studied. [1]

Let's take into consideration the approach of T. E. Sizikova, who offers a different view on the described issues. She believes that reflection plays a role in orientation and choosing from a variety of options necessary for the self-organization of organic systems. In his concept of modal psychology of reflection, T. E. Sizikova combines the differential-holistic approach of A. V. Karpov, the regulatory approach of A. S. Sharov and the differential approach of D. A. Leontiev. She argues that reflection should be considered in the context of the unity of consciousness, thinking, activity and personality, including a comprehensive critical ontology.

The cultural and historical layer penetrates into the highest level of the spiritual layer, known as the meta-model of reflection. In the meta-model of reflection, there are various directions of reflection, such as fragmentary, normative, systemic, holistic, creative, "I", on the "Other", progressive, regressive, on oneself. In addition, the meta-model of reflection uses an inductive way of processing information, a deductive way of processing information and activity. All these components make up the fifth model in the meta-model of reflection, known as the "focus of reflection" [20].

The concept of E.N. Chesnokova is also important, in her opinion, in the process of dialogue, both the teacher and the students are in a state of mutual continuous search for meanings that are the driving force of the educational process and contribute to solving the problem of lack of motivation or

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the gap between activity and motivation, both students and teachers [24].

On the one hand, the reflexive dialogue reflects the movement of the reflexive process (described by G.P. Shchedrovitsky), and on the other hand, this process is placed in the space of interaction between the Self and the Other, and, accordingly, the final stage of this dialogue is a reflexive exit.

The reflexive-dialogic paradigm suggests using the term "composite subject" to denote the subject of cognition (G.I. Davydova) [6]. This leads to a revision of the role of the teacher. The reflexive-dialogic concept of personality orientation development defines the functions of a "composite cognizing subject" that interact and define a reflexive position. One of these functions is related to the development of students' thinking, and the other is related to the organization of interpersonal contact based on the principles of psychotherapeutic practice. Thus, the context determines the reflexive position within the framework of the reflexive-dialogic concept of the development of personality orientation.

Refletechnologies are currently being actively used and developed, especially reflexology, which is a specially organized interaction between people. They are aimed at updating reflexive mechanisms in order to solve intrapersonal life tasks. Reflexive training is one of the forms of reflexology. [1]

Empirical studies conducted by G.I. Katrich, M.I. Naidenova, V.M. Dyukov, S.N. Maslov, O.A. Polishchuk, E.P. Varlamova, I.V. Bayer and others confirm the effectiveness of game reflexive techniques of refletrening.

To achieve personal self-realization and the disclosure of a person's creative potential, it is important to use methods of semantic orientation and personal reflection. Various theoretical works, such as those by L.Ya. Weingerova, D.D. Guryev, V.P. Zinchenko, O.I. Kayasheva, Y.L. Linetsky, E.B. Morgunov, V. M. Pyatunina, E.V.Hajainen and others, discuss the relationship between the formation of semantic orientations, social success and personal reflection. [3,5,6,7,9,15,19,23,24]. These data allow us to suggest the expediency of using educational reflexive dialogue in the form of reflexive training in building life projects of personality in adolescents.

Thus, understanding the nature of reflection, on the one hand, as socio-psychological, mediated by relations with the world and people [1], and on the other — internal mental, manifested through going beyond oneself, including self-reflecting, were for us the most important aspects for building a working model of systemic reflection of personality, which is the basis of the practice of reflexive dialogue presented below.

Problem statement

The formation of human life projects is determined by the systemic reflection of personality, which makes it a deterministic process. This process performs the following functions: formation of a realistic self-image; identification of personal potential through a reflective approach; creation of a constructive personality image; identification of important personal meanings and values necessary for successful life; search and use of "external" resources identified as belonging to significant Others (parents, friends, etc.).

An important feature of reflective dialogue is its focus on oneself. The participants of this dialogue not only exchange ideas and opinions, but also ask questions about their personal characteristics, needs and desires. They consider who they really are, define their goals, and work out the steps they need to take to achieve those goals. In the process of reflective dialogue, there is an expansion of the "semantic space" of a person's life, the inclusion of new significant semantic contents in the hierarchy of personal meanings.

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The results of reflection are the transformation of the reflected reality and the appearance of a transformed representation of it (image, model, state), awareness and appropriation of new personal meanings, a different image of the Self (I. N. Semenov, D.A. Leontiev, V. G. Anikina, etc.), "philosophical understanding of life" (S. L. Rubinstein), etc. [1,11,20].

Let's draw up a general scheme of the student's reflective dialogue.

We present a working model of systemic reflection of personality, the process of its course and the "life project of personality".

the 1st stage. Contact with your image of "I am in the present", "I am in the future". At this stage, the personality is included in the understanding of his Self. The motive of research and awareness of himself, his life activity is formed. The actualization of the "reflecting Self" and the "meta Self" begins.

the 2nd stage. The construction of a space-time continuum of reflection and reflexive reality, namely the images "My present and future. Awareness of one's present begins and an idea of one's future arises.

the 3rd stage. The construction of reflexive positions, in particular the "meta I" — I am reflective, I am reflective-I am the present, I am the future, I am reflective — the image of the present, the future, etc..

the 4th stage. Implementation of reflexive construction of relatively grouped reflexive positions. At this stage, the image of the Self, the image of one's own life activity, is created, which, strictly speaking, may partly be the result of reflection.

The 5th stage. Getting the results of reflection.

We have defined it as subjectively holistic, based on a person's ideas about himself (I am the center) and the image of the future (spiritual and material). This project is dynamically changing and being constructed by a person, meaningfully conditioned by a set of individual life meanings assigned by a person to social values, the psychological space of a person. It includes semantic, value, spatial, temporal, organizational, activity and personal components of life activity. These methodological foundations serve as the basis for the development of a learning reflective dialogue.

Based on age-related neoplasms in childhood, we will implement a reflexive dialogue using the following theoretical provisions: the functional inclusion of systemic reflection in the process of building a person's life project; the actualization of systemic reflection, contributing to the creative level of building and implementing a person's life project; the dialogical nature of systemic reflection and its other types and types.

It is very important to study the psychological present and psychological future of adolescents, excluding their psychologi-
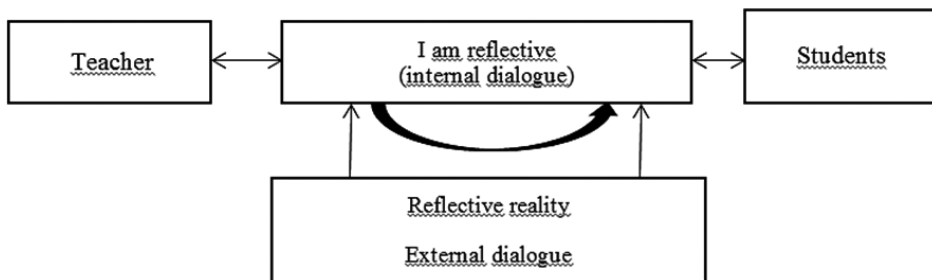

Fig. 1. General scheme of reflexive dialogue

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cal past. Many researchers (I. Bozhovich, L.S. Vygotsky, I.S. Kohn, D.I. Feldstein, E. Erickson and others) confirm that the past (the child) does not matter in the present for a teenager, since it is already present in the present [26; 4, p.48]. Special attention will be paid to the targeted relationship between the present and the psychological future.

It is important to note that the basic principles of building reflexive training in the process of reflective dialogue include the humanistic orientation of the training leader, the creation of conditions for deep intrapersonal work, full-fledged emotional involvement and the use of a diverse range of reflective methods and knowledge in the field of training work.

To achieve maximum effectiveness in conducting the training, it is necessary to take into account the practical side of the issue. One of the key elements is working with a group of 15 people.

The main parameters of the effectiveness of reflective dialogue:

1) awareness and appropriation of personal resources, building a semantic system of perception of time, in which the synthesis of personal ideas about oneself and the world is noted;

2) expanding the range of personally significant values — "value saturation";

3) expanding the range of different spheres of personal activity in the aspect of the future;

4) concretization of life goals as a sequential chain of plans, formation and concretization of a subjective idea of the means, actions necessary for the implementation of plans and concretization of time frames for achieving goals;

5) emotionally positive coloring of the image of the future,

6) building an active position in relation to future life activities, updating effective strategies of behavior in the present;

7) the use of a wide range of functional manifestations of systemic reflection in solving problems of the current life stage;

8) awareness of the role of systemic reflection for the constructive building of one's own life activity.

The purpose of the study is to investigate the influence of educational reflective dialogue on the formation of students' life projects.

The hypothesis of the study: In the conditions of purposeful educational influence through educational reflective dialogue aimed at the formation of students' life projects, in contrast to the usual conditions of their learning, positive changes occur in the structure and content of students' life projects, expressed in greater differentiation, event saturation and manifestations of a greater social orientation of the image of the future.

Organization and methods of research

The sample included 8th grade students aged 13—14 years. At the ascertaining stage of the experiment, 100 children, students of the lyceum "Derzhava" and school No. 17 of the city of Obninsk, Kaluga region, were represented as participants.

60 people were selected to participate in the formative stage of the experiment, including experimental group 1 in the amount of 15 people (a group of one class); experimental group 2 in the amount of 15 people (a group of one class); comparison group (an Intensive class) in the amount of 30 people. The groups differ only in their quantitative composition and the chronological framework of the formative stage of the experiment.

We have chosen a quasi-experimental research plan. At the ascertaining stage of the experiment, the formation of students' life projects was studied. The structure of the life project includes the image of the

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spiritual and material future, consisting of spatial, temporal, organizational and activity components of human life. 3 criteria characterizing the formation of components of life projects were analyzed, namely: the spatial component can be described by evaluating such an indicator as the social orientation of the project. The time component is saturation (eventfulness); organizational and activity component is differentiation (representation of various spheres of future life).

The selection and development of methodological tools were carried out taking into account the set experimental tasks. The meaningful characteristics of a person's life projects are presented in Table 1.

When selecting methods for diagnosing students' personal characteristics, we focused on those variables that characterize a person's personal potential (see Leontiev et al., 2011) and, according to the results of some other studies (L.Ya. Veingerova and D.D. Guryev, Yu.V. Epimakhina, V.P. Zinchenko, O.I. Kayasheva, E.B. Morgunov, V.M. Pyatunina, E.V. Hajainen, etc.), discover a connection with the construction of personal life projects.

1) the method of self-realization (self-actualization of personality) by E. Shostrom in the adaptation of N. F. Kalin, A.V. Lazukin;

2) D.A. Leontiev's method of meaningful life orientations (meaningfulness of life) [12];

3) the method of determining the individual measure of reflexivity by A.V. Karpov [8];

4) reflexive self-report test "Who am I?" by V.S. Mukhina [18];

5) D.A. Leontiev's differential type of reflection [12];

6) The scale of psychological reasonableness of X. Conte in the adaptation by M. A. Novikova, T. V. Kornilova [19];

The period of the study is 2014—2020.

The study was conducted in several stages:

Stage 1 — 2014-2018 Based on the study of pedagogical, psychological, educational and methodical literature, the methodological and theoretical foundations of the study, its object, subject, goals and objectives are determined. The author's structured interview has been developed in accordance with the criteria characterizing the components of a person's life projects, namely: 1) differentiation of life projects, 2) event saturation of life projects, 3) social orientation of life projects and 4) an event series indicated on the timeline of the future. The author's structured interview included such questions as: do you like

Table 1

Methods of studying the formation of students' life projects

Formation of life projects	
Criteria	**Criteria indicators**
Spatial component of life projects	
Differentiation of life projects	The number of spheres of future life activity indicated in the text of the main units or features in the composition of representations Number of elements and groups of elements
Social orientation of life projects	The number of judgments related to interaction in society, with the immediate environment
Time component of life projects	
Event saturation	The number of meaningful and consistent in time described events of future life

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your life?; What events of your life do you remember the most?; When does a person's life become bright and interesting, in your opinion?; Do you plan your life?; Formulate the 5 most important goals for the next year, five years, 10 years. Templates for free-form judgments are also included: Most of all in the future I would like ...; If I could choose my future, then I would...; For my future, the main task at school ...; My future life ...; If a miracle happened, then my future…; When I become an adult, then...; The meaning of human life... etc. The theme of the essay is also indicated: "My life project", in which participants were asked to describe all spheres of their life, including the personal sphere, the professional sphere, and the social sphere.

Stage 2 — 2019 The ascertaining stage of the experiment allowed us to describe the features of students' life projects. The analysis of responses to interviews and essays was carried out using content analysis. The correlation analysis of the degree of severity of the characteristics that reveal a person's personal potential, on the one hand, and the criterion-measured levels of formation of life projects, on the other hand, made it possible to carry out empirical verification of the criteria highlighted by theoretical analysis characterizing the content and structure of a life project. The result of this stage was the planning of experimental work on the formation of students' life projects.

Stage 3 — 2019-2020 The formative stage. Implementation of experimental work on the formation of students' life projects through educational reflective dialogue. The formative stage of the experiment included the construction of a study of the process of forming a life project within the framework of a specially developed developmental program, the methodological form of implementation of which was a training reflective dialogue. This stage was

built as a comparative study of two groups of subjects. In one of them (experimental groups 1, 2 — students of the lyceum "Derzhava" and school No. 17), a developmental program was conducted aimed at forming students' life projects, with another comparison group (control group) traditional forms of career guidance extracurricular activities were carried out. One lesson lasted 1.5 hours, a total of 8 classes were held for each group of 15 participants. The program of educational classes with the first group was held in November-December 2019, with the second — in March-April 2020. In February and April 2020 repeated measurements of the criteria of the life project were made and personal questionnaires were conducted.

Stage 4 — 2020. Systematization and generalization of research results, formulation of conclusions.

Results

At the ascertaining stage of the experiment, we obtained the following data on the formation of students' life projects (Table 2).

Qualitative and mathematical methods of information analysis (content analysis, correlation, comparative). The computer data analysis system "Statistica 8.0" was used to process the received data. In the process of comparing the data, the criteria of signs and the Spearman correlation coefficient were used. The data analysis was comparative and correlative.

Correlation analysis was used to analyze the relationship between the criteria characterizing students' life projects. Spearman's correlation coefficient was used. The data is presented in table 3.

There are significant average positive correlations between the scale "Differentiation of Life Projects." and the scale "Saturation (eventfulness)" (r=0.635, p<0.001). With increasing indicators on the scale of "Differentiation of Life Projects", indicators

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Table 2

Average indicators of criteria for the formation of students' life projects

Average indicators of criteria for the formation of life projects		Differentiate	Saturation
Comparison group	average	1,97	1,20
	standard deviation	0,89	0,96
	maximum	3	3
	minimum	0	0
Experiment. group 1	average	1,73	1,67
	standard deviation	0,59	1,09
	maximum	3	3
	minimum	1	0
Experiment. group 2	average	1,40	1,13
	standard deviation	1,12	0,74
	maximum	3	3
	minimum	1	0

Table 3

Correlation analysis of characteristics of students' life projects

	Saturation	Social orient
Differentiation of life projects	0,635	0,202[*]
Saturation		0,286[**]
Social orient		

Note: * $p<0.05$; ** $p<0.01$

on the scale of "Saturation (eventfulness)" also increase.

There are significant weak positive correlations between the "Saturation (eventfulness)" scale and the "Social orientation of Life Projects" scale ($r=0.286**$, $p<0.01$). With increasing indicators on the "Saturation (eventfulness)" scale, indicators on the "Social orientation of Life Projects" scale also increase.

There are significant weak positive correlations between the scale "Differentiation of Life Projects" and the scale "Social orientation of Life Projects" ($r=0.202*$, $p<0.05$). With the increase in indicators on the "Differentiation of Life Projects" scale, indicators on the "Social orientation of Life Projects" scale also increase.

A correlation analysis was carried out with the participation of all sample groups to identify the relationship between the criteria for the formation of components of students' life projects and their personal characteristics.

Significant moderate positive correlations were revealed between the "Differentiation of Life Projects" scale and the "Goals" scale ($r=0.425$, $p<0.001$). With an increase in indicators on the "Differentiation of Life Projects" scale, indicators on the "Goals" scale also increase.

There are significant moderate positive correlations between the "Differentiation of Life Projects" scale and the "Result" scale ($r=0.434$, $p<0.001$). With the increase in indicators on the "Differentiation of Life Projects" scale, the indicators on the "Result" scale also increase.

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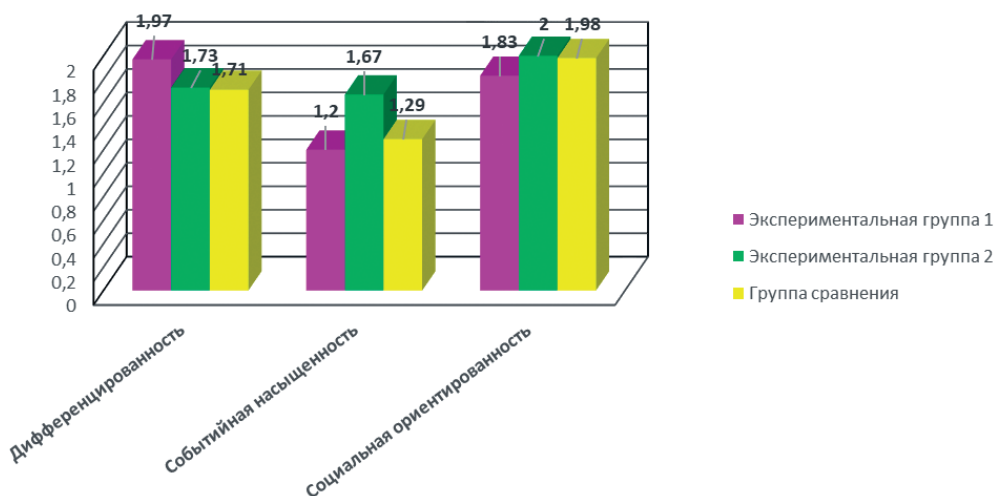## Показатель сформированности жизненных проектов на начало эксперимента

Fig. 2. The results of the study of criteria for the formation of students' life projects, obtained at the ascertaining stage of the experiment

Significant moderate positive correlations were revealed between the scale "Differentiation of Life Projects" and the scale "Locus of Self-Control" (r=0.438, p<0.001). With an increase in indicators on the "Differentiation of Life Projects" scale, indicators on the "Locus of Self-Control" scale also increase.

There are significant moderate positive correlations between the "Saturation (eventfulness)" scale and the "Goals" scale (r=0.34, p<0.001). With increasing indicators on the "Saturation (eventfulness)" scale, indicators on the "Goals" scale also increase.

Significant moderate positive correlations were found between the "Saturation (eventfulness)" scale and the "Result" scale (r=0.303**, p<0.01). With increasing indicators on the scale of «Saturation (eventfulness)», The indicators on the "Result" scale are also increasing.

Next, the average indicators of each group were calculated according to the scales of personal characteristics of students.

The results obtained by us indicate both a low level of formation of students' life projects and a low level of development of students' personal characteristics. To some extent, this is another proof that the formation of life projects and personal characteristics are interconnected, like two processes of personal development of adolescents.

Examining the conjugation of criteria for the formation of life projects and personal characteristics, it was revealed that time orientation (understanding the existential value of life), creative attitude to life (creativity), autosympathy, contact, systemic reflection", volitional regulation of behavior (control-naturalness), the level of general reflexivity, appropriation of socially significant roles, accessibility feelings, openness to new experiences and self-assessment of metacognitive activity are correlated with indicators of students' life projects.

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The methods used made it possible to determine the insufficient formation of students' life projects, the interrelation of components of life projects, their conjugation with the personal characteristics of students.

These circumstances have determined the demand for the development and purposeful implementation of a program of educational classes based on a reflective educational dialogue aimed at changing the life projects of adolescents. To test the effectiveness of this program, a formative stage of the experiment was carried out, in which 30 8th grade students took part. The students were divided into 2 groups of 15 people. Classes were held within the framework of extracurricular activities (vocational guidance work of a secondary school).

The program of developing classes based on the educational reflexive dialogue included the implementation of three areas of activity of its participants: conducting reflexively innovative procedures based on the educational reflexive dialogue and aimed at solving the tasks set in the program; completing homework and reflecting the results of the educational reflexive dialogue in order to realize and integrate them into the inner world of the personality.

The main purpose of the program of developing classes "Life project of personality" is the formation of a life project for students aged 13-14 years through educational reflective dialogue.

Within the framework of the program of developing classes, the following tasks were supposed to be solved:

1. Actualization by a person of systemic reflection, its functions in organizing his own life activity.

2. The formation of a holistic image of myself and my own life (the relationship between the present and the future").

2. Formation of skills of awareness of intrapersonal characteristics.

3. The formation of a creative approach to self-realization and life in general.

4. Awareness of the role of one's self in the constructive transformation of life and the design of the future.

In the first lesson "Who and what am I?" we set ourselves the main goal — awareness of the image of the Self, activation of the "reflecting Self" and "meta-Self". Then, in the second lesson "My personal resource", we direct our attention to awareness of personal resources, the image of the Self and its integrity, as well as semantic and emotional self-determination. In the third lesson, "Working with the image of the present," we focus on understanding the features of our image of the present: temporal, spatial, organizational and activity components, using the activation of reflexive processes for this purpose. Further, as part of the research entitled "My life strategies and plans", we aim to study the most common scenarios and strategies of life activity, as well as to explore their variability and significance for ourselves. In the next lesson, we are engaged in creating new life scenarios and behavioral strategies based on the development of systemic thinking skills. As part of the fifth lesson, "My Image of the Future", the temporal, spatial and organizational aspects of a life project are studied [14].

As a result of the formative stage of the experiment, the students of the experimental groups underwent changes in the content and structure of life projects, they became more differentiated, eventful, and their projects acquired a greater social orientation.

A comparative analysis of groups before and after targeted exposure through reflective learning dialogue showed that, regardless of the initial indicators on the scales of personal characteristics, changes in the content and structure of life projects occur in the vast majority of students (Table 3).

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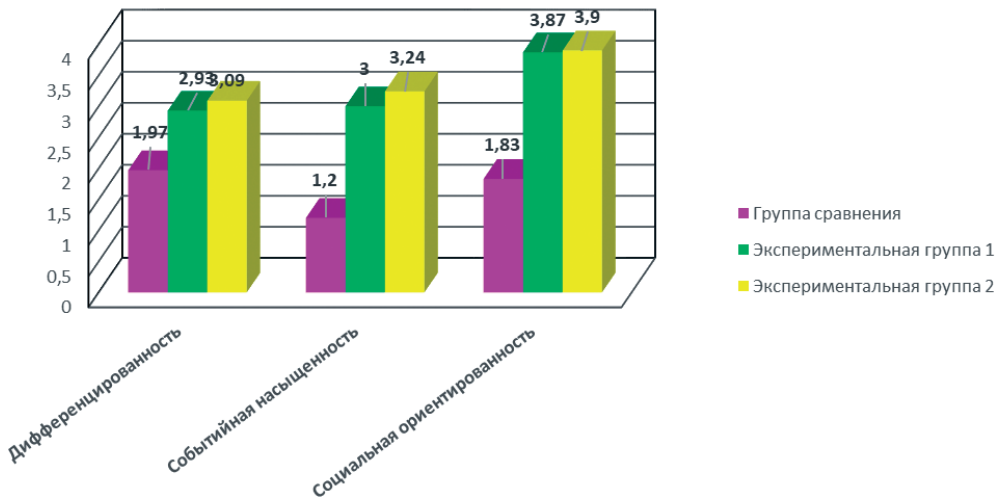
Fig. 3. The results of the study of the criteria for the formation of students' life projects obtained after the implementation of the formative experiment

Table 5

Indicators of criteria for the formation of life projects before and after the experiment, cf. score

Indicators	Experiment. group 1		Criterion of signs	Significance level	Experiment. group 2		Criterion of signs	Significance level	Comparison Group		Criterion of signs	Уровень значимости
	before the experiment	after the experiment			before the experiment	after the experiment			before the experiment	after the experiment		
Differentiation	1,73	2,93	2	p≤0,001	1,71	3,09	0	p≤0,001	1,97	1,97	0	p>0,05
Saturation	1,67	3,00	2	p≤0,001	1,29	3,24	0	p≤0,001	1,2	1,2	0	p>0,05
Social orientation	2,00	3,87	0	p≤0,001	1,98	3,90	0	p≤0,001	1,93	1,93	0	p>0,05

1. Differentiation: Experimental group 1 The shift towards increasing the results is significant at the significance level p≤0.001.

Experimental group 2 The shift towards increasing the results is significant at the significance level p≤0.001.

Comparison group: There is no shift towards increasing the results at the significance level P>0.05

2. Saturation: Experimental group 1 The shift towards increasing the results is significant at the significance level p≤0.001

Experimental group 2 The shift towards increasing the results is significant at the significance level p≤0.001.

Comparison group: There is no upward shift in the results at the significance level of P>0.05

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3. Social orientation: Experimental group 1 The shift towards increasing the results is significant at the significance level $p \leq 0.001$

Experimental group 2. The shift towards increasing the results is significant at the significance level $p \leq 0.001$.

Comparison group: There is no shift towards increasing the results at the significance level $p > 0.05$.

The results of the experiment show changes in the structure and content of students' life projects under the influence of educational influence based on educational reflective dialogue. The data obtained by us using the Wilcoxon T-test (the criterion of signs) indicate the reproducibility of the effect of the proposed program of educational classes based on the educational reflexive dialogue.

Discussion of the results

A comparative analysis of groups before and after targeted exposure through reflective learning dialogue showed that, regardless of the initial indicators on the scales of personal characteristics, changes in the content and structure of life projects occur in the vast majority of students (Table 5).

The results of the experiment show qualitative changes in the structure and content of students' life projects under the influence of educational influence based on educational reflective dialogue. The data obtained using the Wilcoxon T-test (the criterion of signs) indicate the reproducibility of the effect of the proposed program of educational classes based on educational reflective dialogue.

Interpreting the totality of the results obtained, it can be stated that in normal learning conditions and under the influence of the social environment, students' life projects are characterized as poorly differentiated, event-rich and poorly socially oriented. Of course, it should be borne in mind that this is partly due to the

age-related peculiarities of teenagers' perception of the future.

It is important to note that the lack of formation of the substantive characteristics of the project determines the associated undeveloped personal characteristics. It can be assumed that in the context of a learning reflective dialogue, along with changes in the content and structure of life projects, personal characteristics are revealed and improved, that is, personal development takes place. Such personal characteristics as time orientation (understanding the existential value of life), creative attitude to life (creativity), autosympathy, contact, systemic reflection", volitional regulation of behavior (control-naturalness), the level of general reflexivity, appropriation of socially significant roles, accessibility of experiences, openness to new experience are especially susceptible to change and self-assessment of metacognitive activity. Based on the above, it can be assumed that through reflection on life projects, it is possible to influence the personal characteristics of students, which is significant for further study and analysis of effective tools of psychological and pedagogical practice.

Conclusion

The concept of "personal life project" is interpreted as the direction of the "future", which a person defines for his own life activity, perceived by him as favorable and dynamically changing. It is determined that the structure of the life project includes an image of the spiritual and material future, consisting of spatial, temporal, organizational and activity components of human life.

It is confirmed that the structural components of life projects are characterized by the following criteria: the spatial component can be described by evaluating such criteria as social orientation, the organizational and activity component by evaluating

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differentiation (representation of various spheres of future life) and the temporal component is described by event saturation (eventfulness).

In conditions of purposeful educational impact through educational reflective dialogue aimed at the formation of students' life projects, in contrast to the usual conditions of their learning, positive changes occur in the structure and content of students' life projects, expressed in greater differentiation, event saturation and manifestations of a greater social orientation of the image of the future.

In the course of the study, it was experimentally established that: students' life projects formed in normal learning conditions are poorly differentiated, event-impoverished and poorly socially oriented. Actualization of the process of changing life projects in a purposeful educational impact contributes to positive changes in the content and structure of students' life projects, which manifest themselves in: complicating the structure of ideas about future events by increasing the content: the number of spheres of life, events; in the manifestation of a greater social orientation of life projects.

Educational reflective dialogue is one of the conditions that determines changes in the structure and content of students' life projects.

It has been experimentally established that changes in the structure and content of life projects occur equally among all students, regardless of their personal characteristics. The reproducibility of the effect of the applied technology based on the educational reflexive dialogue is proved.

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Critical Thinking in the Context of Embodied Cognition: A Review of Research and its Pedagogical Potential

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The article presents an overview of current research on critical thinking based on the hypothesis of embodied cognition and representing the so-called non-Cartesian approach to thinking, in which the rational and the sensual do not act independently from each other, but as a closely related group of processes. Despite the fact that the topic of critical thinking is yet in the process of formation, the review is systematic and contains indications of two main directions, their theoretical guidelines and methodological guidelines. A comparison of the identified approaches makes it possible to identify the mechanisms that are key to any embodied version of the critical thinking model: an individual's sensitivity to his own explicit and implicit epistemic signals, or dispositional attentiveness, and emotional non-activity. It is shown that interdisciplinary transfer in this topic is problematic: knowledge produced in the psychological framework of embodied cognition research is inherently different from knowledge that allows improving the learning process of critical thinking. The results obtained open up prospects for further research and ways to reorganize pedagogical practice in the field of teaching critical thinking.

Keywords: critical thinking; critical thinking development; embodied cognition; somatic markers; non-Cartesian cognition; executive functions; microphenomenology; emotional reactivity; epistemic inhibition; metacognitive skills; metacognitive awareness.

Критическое мышление в контексте воплощенного познания: обзор исследований и их педагогический потенциал

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В статье представлен обзор современных исследований критического мышления, опирающихся на гипотезу воплощенного познания и представляющих собой так называемый некартезианский подход к мышлению, в котором рациональное и чувственное выступают не автономно друг от друга, а в виде тесно связанной группы процессов. Несмотря на то, что тема критического мышления в данном исследовательском направлении находится в стадии формирования, обзор носит систематический характер и содержит указания на два основных направления, их теоретические ориентиры и методологические установки. Сравнение выявленных подходов позволяет определить механизмы, являющиеся ключевыми для любой воплощенной версии модели критического мышления: чувствительность индивида к собственным явным и неявным эпистемическим сигналам, или диспозиционная внимательность, и эмоциональная нереактивность. Показано, что междисциплинарный перенос в данной теме является проблематичным: знание, произведенное в психологических рамках исследований воплощенного познания, по своей сути отличается от знаний, позволяющих усовершенствовать процесс обучения критическому мышлению. Полученные результаты открывают перспективы дальнейших исследований и способов реорганизации педагогической практики в сфере обучения критическому мышлению.

Ключевые слова: критическое мышление; развитие критического мышления; гипотеза воплощенного познания; гипотеза соматических маркеров; некартезианские модели познания; управляющие функции; микрофеноменология; эмоциональная реактивность; эпистемическое торможение; метакогнитивные навыки; метакогнитивная осознанность.

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Введение

The influence of Descartes on the development of mind theory is difficult to overestimate. J. Searle notes that the cartesian tradition not only left a dualistic legacy for mind science, but also formed the basis of what opposes the dualistic worldview [57]. Contemporary models of cognitive architectures, which seem very far from Descartes' views, still retain references to him, at least in their name — non-cartesian architectures [21; 40; 60]. Non-cartesian models do not consider rationality the antithesis of materiality, so mind and body are not presented as separate entities (in contrast to the central thesis of cartesian theory). This term, non-cartesian mind, informally indicates a set of hypotheses that expand the concept of mind beyond internal cognitive processes. The embedded cognition hypothesis, that follows the ecological approach in psychology, suggests that the complexity of internal cognitive operations can be reduced by relying on appropriate structures in the environment. The extended cognition based on the idea that specific objects in the environment can function as a part of the human cognitive architecture. The hypothesis of enacted cognition interprets consciousness as a property of a living system that is formed at the boundaries between the body and the outside world due to the accumulation and configuration of individual experience. In this article, we consider the fourth of such hypotheses included in the corpus of concepts 4E, which has less externalism orientations and is associated with the inclusion of cognitive processes in the "body context". This is the hypothesis of embodied cognition [11; 20], which completely refutes the thesis of mind and body separability and asserts that at least some mental processes are constituted not only by brain processes, but by a combination of these and broader physical processes.

If the problem of critical thinking can be presented within the framework of a cartesian and non-cartesian approach, then the former is reflected in many publications [2; 5; 6; 7; 8; 11; 12; 13; 15 et al.], while the second is practically not represented in Russian literature. So, for example, a critical thinker is called someone who is focused on the search for truth and is able to "exclude the area of the irrational" [2, p. 128], who is familiar with the operation of methodical doubt [13, p. 1], who strives to "make their thinking more perfect" [15, p. 133]. As for the "embodied" mechanisms of critical thinking, mostly they are interpreted through the analysis of cognitive biases, that is, systematic deviations in reasoning that are natural for many people [3; 5]. This topic is wildly discussed in global academic literature [22; 32; 38]. On the one hand, attention to such deviations serves as a good reminder that the processes of reasoning are immersed in a body context. On the other hand, such an approach is not truly non-cartesian, and for an untrained reader it probably supports the dualistic worldview: the critical mind is opposed to the "uncritical" body, which, as it were, hinders thinking, distorting cognitive activity with various unconscious biases.

All this allows us to formulate several questions: is it possible to merge critical thinking and the non-cartesian paradigm? If so, how exactly can this help us strengthen or expand the understanding of critical thinking? If not, does this mean that critical thinking is out of current paradigm? In this article, we propose to focus on studies in which critical thinking is interpreted not through the opposition or hierarchy of ratio-

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nal and sensual, but through their synthesis. On the one hand, there is a potential for such new theories. On the other hand, the development of such theories has practical relevance for improving teaching methods and critical thinking, which, as is known, is one of the goals of school education and constitutes the first universal competence in Russian higher education standards.

Non-cartesian models of cognition: historical background

It is not difficult to find reflections of the cartesian worldview in the way humanity has organized traditional education processes. For example, this can be seen in the approach to learning, according to which knowledge is a prerequisite for practice, that is, mastering knowledge must precede its application. In this regard, D. Lorillard notes that in the UK the vast majority of academic time is spent not on activities in this field, but on working with analogies, historical reports, criticism, statistics, case studies, diagrams [39, p. 55]. It is this attitude that has been challenged by such pedagogical strategies as, for example, problem-oriented learning, in which the acquisition of knowledge occurs in the process of solving a specific problem, when the need for new information precedes its receipt. And yet, what D. Lorillard's remarks were aimed at is in some way consistent with the ideas of classical philosophy about the sublimity of theoretical knowledge in relation to everyday practical problems. However, what seems to be overlooked here is that in philosophy, formalized theoretical knowledge is the result of abstraction from a particular experiential manifestation, and not the initial condition of this experience. Criticism of D. Lorillard is not a problem of one author. For example, M. Nathan designates the problem as FF-approach (formalism-first) [43; 44], and A. Glenberg, D. Schwartz, T. Martin and N. Nasir are opposing second-hand learning (description of experience) to first-hand learning (direct experience) [30; 56]. Regardless of the chosen vocabulary, the described approach illustrates how the mindset of dualism manifests itself in the separation of getting knowledge and applicating of knowledge. This creates the illusion that one of these two processes is primary or more important in learning, while the fundamental assumption uniting the critics' comments is that these processes are fundamentally inseparable from each other.

A. Damasio devoted a significant part of his scientific career to refuting this assumption. In 1994, in Descartes' Error [23], he proposed to reconsider the relationship between mind and emotions basing on evolutionary neuropsychology. The hypothesized that emotions do not oppose thinking open up the very possibility of acting intelligently without thinking about it. The most famous example is fear, that is, a program of emotional actions that can quickly lead a person away from danger with little or no help from the mind. From Damasio's point of view, the reasoning system evolved as an extension of the automatic emotional system. This point of view is based on data from several years of studying people whose behavior was changed as a result of brain damage in a certain sector of the frontal lobe. Observations of these patients eventually led to another important idea, which is the notion that brain systems that are jointly involved in emotions and decision-making are constantly involved in the management of cognition and social behavior. Dama-

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sio's concept has become the subject of a lengthy debate. One side made a rhetorical proposal to rename the publication the "Damasio's Error", and if it is impossible to ignore its results, then at least try to introduce experimental data into the Cartesian model. Such were the debates between A. Damasio and D. Kirkeben [24; 25; 35; 36]. Another part of the academic community, on the contrary, supported the revision of the idea of mutual autonomy of the sensual and rational [17; 52], as a result of which today in some areas of science, for example, in the economics of decision-making, statements about the connection of emotions with reasoning have generally ceased to be considered unusual. Among the supporters, fD. Dennett noted that Damasio does not reduce the human mind to flows of hormones and neuromodulators, but offers a model of mechanisms that support and implement this human activity, turn the "miracle" of thinking into an object of scientific knowledge [29, p. 4]. Then, in "Looking for Spinoza" [26], Damasio tried to revive the Spinosian doctrine of affects within the framework of neurobiology. Now not only emotions, but also feelings are an integral part of how we think. He believes that most ideas a person has are formed from messages coming from "his own body", and that the idea of himself is a combination of the perception of an object with the perception of own body. Already in 2018, when asked how the mind came about, A. Damasio gives this answer: we have a mind not only because we have a nervous system, but because everything else is there — from the skeleton to sensory experiences [27].

A. Damasio's concept was called the somatic markers hypothesis, that is, psychophysiological signals about the work of the decision-making mechanism. However, the body context of rationality is not a problem of one author. Neuroscientists support this position, pointing out that emotions are part of reasoning, not a distraction that disrupts the "cold" rational process, and that the mechanisms of emotion and cognition are intertwined at all stages of stimulus processing, and their distinction may be difficult [47, p. 46]. Many works of recent decades show various aspects of the body (and in some versions even out-of-body [34; 50; 51]) contribution to cognitive processes. It is fair to note that Damasio was not the first defender of the hypothesis of embodied cognition. For example, the influence of body movement on the formation of abstract concepts expressed using metaphors was considered back in 1980 [37]. And yet, such works, unlike Damasio, to a lesser extent claimed the status of a fundamental concept of mind activity, taking into account the body contribution. Thanks to all these studies, we now know that cognitive processing of information about actions activates the same neural regions that are responsible for performing these same actions, and that understanding as an example of the highest function of thinking is not an out-of-body process [45; 48; 49; 59], and in 2023, a team of scientists from Germany, Italy, France and Russia presented a consensus report on when and how perceptual processes are involved in cognitive ones [18]. Affirming the importance of emotions does not mean that emotions are more important than analytical procedures in the process of thinking, or that emotions alone are the source of correct judgments, but it means that emotions play an important role in how critical thinking is implemented.

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Critical thinking as an executive function

Critical thinking can be considered as an executive function or a set of such functions [28; 41; 42]. The executive functions are cognitive processes that regulate, control and manage other cognitive processes: working memory, attention, cognitive flexibility, inhibitory control, planning, search and correction of errors [4, p. 22]. Unlike other terms through which different sciences refer to the idea of rationality, executive processes are not opposed to emotional regulation, and the relationship between them is widely studied in neuropsychology.

Based on modern research in this area, we can note that in some concepts, brain processes, including the ones that are related to emotions, set the conditions for the implementation of critical reasoning. Some researchers refer to such processes as dispositional mindfulness (or dispositional awareness) and non-reactivity [41]. Dispositional mindfulness is a term denoting a person's ability to focus on the present moment, momentary experiences, feelings and needs. Within the framework of research on critical thinking, it is important to assume that this process is responsible for detecting affective signals that are usually overlooked and which indicate that the current state of a person does not correspond to his target state [46]. This, in turn, allows to launch mechanisms for monitoring conflicts that arise in the process of information processing and signal the need for control and intervention in background cognitive processes [19; 58]. Non-reactivity, on the contrary, is a control aimed at suppressing affective signals, which allows you to start regulating emotions before the reaction becomes too intense [41; 46]. In some recent studies, the ability to update information stored in working memory and to intentionally suppress certain emotions are defined as neuropsychological predictors of critical thinking [41].

Thus, the involvement of emotions in the processes of critical thinking can be bi-directional: on the one hand, emotions allow us to fix conflicts that indicate the need to regulate reasoning, and on the other hand, the "inhibition" of affective reactions allows you to avoid quick conclusions and subject these conflicts to slow analysis. When viewed in this way, the rational and the sensual do not act independently of each other, but as a closely related group of processes that trigger critical thinking. Different combinations of these two functions can express a variety of critical thinking strategies due to several variables, the extremes of which are high or low sensitivity to epistemic conflicts, reactivity or non-reactivity.

From this point of view, the ideal critical thinker appears to be a person with a high sensitivity to conflicts and low reactivity, which suggests that the conditions for the implementation of acts of critical thinking are not the same for people with different levels of emotional reactivity.

Critical thinking as phenomenological awareness

The ideas about the importance of dispositional mindfulness and non-reactivity for critical thinking largely echo the position presented by researchers at the ECT (Embodied Critical Thinking) Centre, which was opened in 2018 at the Institute of Philosophy of the University of Iceland. Defining the reinterpretation of critical thinking in terms of the hypothesis of embodied cognition as the main task of the Centre, the team addresses the question of how exactly ideas resonate in sensory experience and suggests several strategies.

D. Schoeller focuses on phenomenological awareness [53; 54; 55], that is, the ability to track a person's individual experience in the context of making a critical decision. The author notes that traditional approaches to critical thinking are based on a process of gradual detachment from subjective, sensual and emotional factors. The gap between a person's life experience and the expected "correct knowledge" seems to be a suitable explanation for the processes of opinions polarization in modern society. The tradition of dividing knowledge into "objective" and "subjective" has a long history, but in the modern world a person often has to process large amounts of information in a very limited time and rely on implicit meanings, images, intuitions. Hence, it arises a paradoxical tension: a person is tacitly asked to think without the participation of his life experience, feelings, situational context, which seem to be necessary for thinking. For example, we use conventional language to explain our unique experiences and our implicit knowledge, and notice that existing concepts do not fit. A state in which we understand that words do not quite correspond to what we want to say, and which is fundamentally important for a critical thinker, is also a sensual state. Thus, the development of critical thinking is not working with knowledge exclusively, but also with the experience of relevant others [31]. The point of view presented by the researchers shows the internal orientation of dispositional mindfulness in micro-phenomenological terms. Micro-phenomenology begins with the premise that attention to our experience and its formulation is an unusual action, prone to distraction and confusion, and therefore requires effort [31], and unlike other phenomenological approaches, it is aimed at very short periods of experience. Directing our attention to our sense of situational context to how we *feel* the situation does not mean that the practice of such thinking implies unconditional trust in our own emotions, feelings and intuition. G.R. Johannesdottir, combining these commentaries, defines critical thinking as a transition from embodied perception to verbal thinking through analysis our reactions to current cognitive situations [33, p. 335].

"Embodied" Critical Thinking: the problem of interdisciplinary transfer

The synthesis of the embodied cognition hypothesis and the critical thinking is possible, although the question of how exactly we should understand such integration remains unclear. For example, the claim that critical thinking control centres develop in the prefrontal cortex is not opposed by science today. However, by itself, the statement of scientific facts does not bring practical benefits for teachers engaged in the development of critical thinking. How exactly should knowledge of this fact be reflected in the programs of critical thinking classes? What can a teacher do with this statement, other than just to know it? In our understanding, interdisciplinarity does not consist in referring to theses from related disciplines, but in developing new theses that are equally useful in different sciences. Based on the presented results, it can be assumed that from the point of view of embodied cognition, the practice of developing critical thinking may be more effective if some additional factors are taken into account.

Firstly, if the acts of critical thinking are not universal, then their implementation requires the individuals to be aware of how their own reaction and sensitivity

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systems are arranged, and this awareness is a condition of critical thinking, that is, it precedes it. In other words, the strategy for developing critical thinking skills may be different depending on the initial characteristics of the degree of emotional reactivity of students, which can be measured, for example, using the Perth scale [10]. From the standpoint of pedagogy, this assumption can be embedded in the idea of individual learning trajectories. The higher the reactivity, the more difficult it is to apply critical thinking skills, therefore, the longer and slower the learning process of these skills will be. However, it is premature to describe this assumption as a pattern, and the measure in which this indicator becomes significant for critical thinking requires preliminary research. Obviously, the lack of reactivity in general can weaken not only emotional reactions, but also the desire for critical analysis. This happened in 2016 with a study by K. Noone, B. Bunting and M.J. Hogan (reactivity was measured using the FFMQ-SF). Contrary to their hypothesis, the researchers found that lack of reactivity has a negative relationship with critical thinking. It is possible that the measure of non-activity used in the study reflects a tendency towards inoperable processing that goes beyond just emotional signals; the questionnaire questions used to assess non-activity focus on the ability to get rid of experiences, rather than persist in them [46, p. 11].

Secondly, the development of critical thinking can be combined with general training of emotional non-reactivity. It is believed that the latter depends on the quality of sleep and the level of anxiety, which are problematic for students, but it is also trained by mindfulness exercises, commonly used in stress therapy [61], and meditative practices aimed at emotional and cognitive control. Currently, techniques for developing mindfulness in the framework of psychological support are widely discussed in Russia [8; 16], improving academic performance [1], developing creativity and creative potential [14], and it seems appropriate to expand these studies into the field of critical thinking.

Thirdly, the literature review does not allow us to answer the question whether such process as epistemic inhibition exists and what special properties it has. It is this kind of regulation that seems to be fundamentally important for building non-cartesian models of critical thinking. Learning how to formulate logical inference, one of the main skills of critical thinking, seems incomplete without reverse training in "inhibition", or, to put it more academically, the practice of suspended judgment. This proposal follows from the analysis of the emotional contribution to the reasoning process, but it becomes especially relevant in the social context. The digital world contains more information than all the libraries in the world, and most of the information comes from unverified sources and is not reliable. A critical understanding of all the information and sources we come across would completely paralyse us, because we would never have time to really read valuable information. Investing critical thinking in sources that should have been ignored initially means that unscrupulous informants got exactly what they wanted, our attention. It is also known that the main tool of the information market is emotions, and therefore the practice of "epistemic inhibition" becomes significant.

Conclusions

Our review of the highlighted topic shows that critical thinking can be de-

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scribed as embodied cognitive activity. The results of the analysis make it possible to assert that the emotional and sensual contribution to the reasoning process can be considered as part of the mechanism of critical thinking, and not its antithesis. The materials indicate that it is premature to talk about an accurate description of embodied critical thinking, but some of its features are already beginning to manifest themselves.

These transformations are of particular importance for the practice of teaching critical thinking. If the traditional focus on logical analysis skills is shifting towards reflexive analysis of sensory experiences and emotional self-regulation, then the pedagogical technique is also changing. This means that in the future, critical thinking classes may include, for example, measurements of emotional reactivity, and training programs will be adapted to the individual characteristics of students.

From the point of view of the concept of executive functions, these processes can take place in the background, while the concept of critical thinking as phenomenological awareness comes from the idea of their reflexive accessibility. Regardless of the orientation of the concept, as shown in this article, emotions are involved in critical thinking in two directions. On the one hand, they are active when they allow you to fix conflicts that indicate the need to regulate the ongoing reasoning process. On the other hand, they are passive when affective reactions are "inhibited", and passivity in this case does not mean the absence of emotions as such, but their specific state.

As a conclusion, it is possible to clarify the concepts that in this study were identified as significant for further research of embodied models of critical thinking. Dis-positional mindfulness is a form of reflection characterized by a purposeful concentration of attention on the experience received at the current moment. The dispositionality component clearly indicates that such reflection is related to a person's predispositions to distribute attention and refers to "higher dispositions" related to the value orientations of an individual. This does not mean that attentiveness to the present is not trainable, but both the terminological and substantive aspects of mindfulness, essential for critical thinking, have yet to be determined in further research.

Dispositional mindfulness is a general psychological term, not a term specifically for theories of critical thinking. For this area, attention to epistemic conflicts will be more specific, that is, the ability to recognize the signals of the current situation indicating the need for critical intervention. Unlike other forms of metacognitive regulation, epistemic processes are associated with solving only one group of tasks, namely, establishing the degree of reliability of information (attribution of truth, falsity, uncertainty, fixation of ignorance or recognition of delusion). If we consider critical thinking as a method by which such tasks are solved, then dispositional attention can be expressed by such questions as "Why does this seem convincing to me now?", "What in the current environment pushes me to this decision?", "Is my decision justified by current experience or is it more familiar, what is the reason?". The ability of an individual to postpone making a decision, even when it seems obvious, and to dwell on such issues has been designated by the term "non-activity". The hypothesis of embodied cognition asserts that such an epistemic process is not always con-

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scious, and therefore some of these signals remain implicit. Explicit signals (for example, the apparent inconsistency of a message or the expectation of bias from an informant) are much more studied in both pedagogical and psychological concepts of critical thinking. The training of recognizing such signals involves critical thinking. However, non-cartesian models of critical thinking admit that implicit signals can also be useful for critical thinking. This thesis is generally accepted in relation to expert thinking, and by analogy it can be assumed that implicit signals are associated with critical intuition — a concept that is also of interest for future research in this direction. It can be said, so far as a preliminary assumption, that the higher the sensitivity to such signals, the more implicit signals become explicit, as they move from the field of intuition to the field of dispositional attention.

The research questions that were indicated at the beginning of the article, can be answered now. There is definitely a point of contact between critical thinking and the non-cartesian mind paradigm, although this scientific direction is only forming currently. This direction complements the interpretation of critical thinking with reflection on sensory experience and expands the practice of teaching critical thinking through ideas about training different ways of emotional response. The very fact that the concept of critical thinking can be formulated based on different foundations of psychological knowledge means that the scientific problem is not alien to the current paradigm.

The question of whether critical thinking turns into an extra-paradigm problem disappears, but the question of how exactly the hypothesis of embodied cognition can improve our practice of teaching critical thinking remains. The considerations on the transfer of the results of psychological research into the field of pedagogical practice, proposed in the article, serve rather as an illustration of the fact that such a conceptual synthesis is not fundamentally impossible. However, the boundaries of such a transfer are not currently defined. All this indicates that the development and further empirical verification of "embodied" models of critical thinking is not a solution to a scientific question, but a way to pose new and correct existing issues in the field of education.

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Exploring the Role of Self-Efficacy in Station Rotation: Enhancing Critical Thinking and Literacy Skills Among Primary Learners

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The aim of the research is examining how the Station Rotation model and self efficacy in their abilities affect their critical thinking and literacy skills in primary schools. The Station Rotation model allows students to engage in various learning activities across different stations. Self-efficacy, the belief in one's abilities to achieve tasks, both are examined for their influence on educational outcomes. The study engaged 203 students with ages ranging from 10 to 11 years from 5 schools in Malang City, Indonesia. The research was facilitated online via Zoom Meeting: the experimental group was exposed to the Station Rotation model, while the control group underwent traditional teaching. The participants were chosen through cluster random sampling based on geographic locations. The study employed a quasi-experimental structure with both pre-test and post-test control group configurations. Instruments used included 30 self-efficacy queries, 5 critical thinking assessments, and 20 literacy evaluations. Reading scores were further examined using the SMOG formula. The gathered data underwent manual multivariate examination using Hahs-Vaughn's formula. Key findings indicated: 1) the Station Rotation model significantly boosted students' critical thinking (sig=0,000) and literacy abilities (sig=0,002); 2) varying self-efficacy levels notably impacted learning results in critical thinking (sig=0,044) and literacy (sig=0,046); and 3) no discernible correlation existed between the teaching models and self-efficacy regarding critical thinking (sig=0,691) and literacy abilities (sig=0,262). This methodology provides insights for educators, emphasizing its suitability for online use, especially during resource-limited times like pandemics.

Keywords: station rotation model; self-efficacy; critical thinking; literacy skill; quasi-experimental design.

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Исследование роли самоэффективности в модели ротации станций: повышение критического мышления и навыков грамотности среди младших школьников

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Цель исследования — изучить, как модель ротации станций и самоэффективность влияют на критическое мышление и навыки грамотности в начальной школе. Модель ротации станций позволяет учащимся выполнять различные учебные действия на разных станциях. Самоэффективность, вера в свои способности выполнять задачи — оба этих аспекта исследуются на предмет их влияния на образовательные результаты. В исследовании участвовали 203 учащихся в возрасте от 10 до 11 лет из 5 школ города Маланг, Индонезия. Исследование проводилось онлайн через Zoom Meeting: экспериментальная группа работала по модели ротации станций, в то время как контрольная группа занималась по традиционной методике. Участники были выбраны методом кластерной случайной выборки на основе географического расположения. Исследование использовало квазиэкспериментальную структуру с конфигурацией контрольной группы с предтестом и посттестом. Использованные инструменты включали 30 запросов на самоэффективность, 5 оценок критического мышления и 20 оценок грамотности. Уровни чтения до-

полнительно проанализировали с использованием формулы SMOG. Собранные данные подверглись мануальному многовариантному анализу с использованием формулы Хас-Вон. Основные результаты показали: 1) модель ротации станций значительно улучшила критическое мышление учащихся (sig=0,000) и способности к грамотности (sig=0,002); 2) различные уровни самоэффективности заметно повлияли на результаты обучения критическому мышлению (sig=0,044) и грамотности (sig=0,046); 3) между методами обучения и самоэффективностью в отношении критического мышления (sig=0,691) и способности к грамотности (sig=0,262) не было обнаружено заметной корреляции. Эта методология предоставляет ценные идеи для педагогов, подчеркивая ее пригодность для онлайн-применения, особенно в условиях ограниченных ресурсов, например, во время пандемий.

Ключевые слова: модель ротации станций; самоэффективность; критическое мышление; навыки грамотности; квазиэкспериментальный дизайн.

Introduction

Literacy skill is a crucial component in processing information. All knowledge and intelligence can be obtained from oral or written forms. To effectively acquire knowledge through writing, one must possess literacy skill, specifically in reading comprehension. This reading comprehension skill can help students understand most information easily. The outcomes of this comprehension can enhance the analytical reasoning abilities among learners. Such reasoning ability encompasses the capacity to partake actively in contemplative and independent thought. Understanding terms like literacy skills, critical thinking, and self-efficacy is crucial because they lay the foundation for students not only to absorb information but also to analyze, evaluate, and apply it in real-life situations. These skills are critical in preparing students for the challenges of the 21st century, where the ability to think independently and adapt to change is key to success. Individuals who can think critically generally can trust themselves to solve problems. In other words, individuals who can think critically are individuals who can make decisions and formulate their opinions independently [11; 21].

The connection between literacy comprehension and analytical reasoning abilities has been extensively explored in various academic studies. Herman [16] in his research argues that reading comprehension involves more than just recounting the content of a text; it requires a process of thoughtful engagement. This process is where critical thinking skills come into play. For instance, a student might read a passage about a historical event and simply list the facts mentioned, without considering the wider context or implications of these facts. In contrast, a student who engages in a thoughtful process while reading would analyze the information, consider different perspectives, and draw connections to other events or ideas. Research has shown that when individuals engage in critical reading, their critical

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thinking skills also improve, suggesting a close relationship between the two [7; 30]. Reading is fundamentally a process of learning through constructing meaning. An example of this in primary school students might involve a teacher presenting a short passage about animals living in the jungle. The teacher could then ask the students to identify the main idea, make connections and inferences, and evaluate the author's credibility. By participating in these activities, students are not just passively reading; they are actively constructing meaning from the text and developing their reading comprehension skills.

The ability to think critically and read comprehensively is closely linked to the concept of self-efficacy in individuals. The term self-efficacy in this research is specifically defined as an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments, reflecting confidence in the ability to exert control over one's own motivation, behavior, and social environment. Self-efficacy plays a significant role in cognitive development and is a key factor in academic outcomes for students [37]. This relationship is further supported by research conducted by Olivier [29] which suggests that the level of academic goals set by students can influence their academic performance. In other words, a student's confidence in tackling problems contributes significantly to their success in developing critical thinking and literacy skills. Essentially, when students believe in their capabilities, they are more likely to engage deeply with reading materials, apply critical thinking skills, and achieve higher levels of understanding and academic performance. This highlights the importance of nurturing self-efficacy in educational settings to enhance students' literacy and critical thinking abilities.

According to the National Education Association [31], to be competitive in 21st-century learning, students must develop proficiency in four key areas: creativity, collaboration, communication, and critical thinking. Specifically focusing on critical thinking skills, students are expected to have the ability to navigate complex challenges they encounter daily. This involves identifying problems and applying logical reasoning and analysis to find solutions for unforeseen dilemmas [27].

The development of these critical thinking skills is not confined to specific subjects or situations; rather, they should be integrated into all aspects of education. This means that students should be encouraged to practice and apply these skills in every lesson, whether working in groups or individually. The emphasis is on making the ability to interpret and analyze information a familiar and integral part of their learning process, ensuring they are well-equipped for the challenges of the 21st century [18; 44].

The presence of technology in the world of education makes a positive contribution to learning; learning becomes more interactive [38]. One of the biggest impacts in the world of education is the emergence of a new paradigm in learning without boundaries of distance and time. With the presence of technology in learning today, educators can use online learning as an effective educational mode [12; 36].

Several studies have shed light on teaching challenges at the primary school level in Indonesia. A preliminary study conducted in 2021 focused on grade 5 teachers in primary schools across three cities in East Java Province, Indonesia — Malang, Gresik, and Mojokerto. This study found that many teachers still relied heavily on a teacher-focused learning model [28]. While this approach may still be relevant for teaching basic concepts to students in lower grades, its continual use across all levels of primary school has been linked to lower student learning outcomes, as indicated by achievement value indicators [2; 33]. Furthermore, research by Sarwanto [39] highlights that some fifth-grade students, particularly in science, struggle to understand information presented in teacher-led sessions. These studies collectively suggest that current teaching methods in Indonesia's primary schools may not adequately support the development of students' critical thinking and literacy skills. Addressing this issue requires the adoption of a learning model that is both flexible and user-friendly, one that can effectively enhance students' critical thinking and literacy capabilities. This shift in teaching approach is essential for fostering more engaged, thoughtful, and literate students who are better equipped for academic success.

If we consider the results of collaborative research conducted by the Indonesian Government and a private survey institute [25], Indonesia's digital literacy index score currently stands at 3,49, placing it at a medium level. This indicates that the Indonesian population is generally prepared for the integration of technology in learning, whether in a blended format (combining traditional face-to-face teaching with online methods) or through fully online courses. This medium-level score suggests that while there is a substantial degree of readiness and capability among Indonesians to engage with digital learning platforms, there may still be areas that require further development to fully leverage the potential of technology in education. This readiness is crucial for the effective implementation of technological tools and methods in the learning process, aligning with global trends towards more digitalized and accessible education.

Addressing the current educational challenges and accommodating different learning styles necessitate a learning model that effectively combines group work and individual activities. The Station Rotation model presents a viable solution for this need. In this educational approach, the primary activity centers around 'learning checkpoints'. The Station Rotation model involves various stages, including teacher-led direct instruction, group-based collaborative activities, and elements of online learning [10]. In practice, the model starts with each student listening to material explanations from the teacher. Subsequently, students are divided into several groups, corresponding to the number of stations or checkpoints prepared. Typically, there are three or more stations. The activities at these stations vary, including both group and individual tasks, with at least one station dedicated to online learning [49]. Students rotate through each station according to the teacher's guidance, ensuring that all groups experience every station [17]. Over time, the Station Rotation model, originally designed for blended learning, has undergone adaptations to suit fully online learning environments. This study utilizes the syntax of the Station Rotation learning model in its online version, as developed by Julie Mason [23] and Catlin Tucker [47]. The flexibility of this modified model allows for its implementation in both blended (offline and online) formats and exclusively in online settings. With these adaptations, the model caters to a range of learning environments and preferences, offering a dynamic and versatile approach to modern education.

Several studies have highlighted the benefits of using the Station Rotation model in educational settings. This model contributes significantly to creating a dynamic and engaging atmosphere for both teachers and students in each lesson [6; 40]. Its structure, which includes learning in groups, individually, and through various activities, enhances the effectiveness of teachers, particularly in large class settings [48]. However, while acknowledging the positive aspects of this learning model, it's also important for educators to consider the facilities and infrastructure required. For instance, classroom size is a crucial factor; there needs to be sufficient space to allow students to move comfortably during the rotation stages. This requirement is especially relevant in traditional, in-person learning environments where physical space can be a constraint. Nonetheless, many of these challenges can be mitigated with the advancement of information technology. The evolution of digital tools and platforms enables more flexibility in how the Station Rotation model can be implemented, particularly in settings where physical space is limited. For example, online and blended learning formats can accommodate the Station Rotation model without the need for large physical spaces, thereby broadening its applicability and effectiveness in various educational contexts. This adaptability is key in ensuring that the Station Rotation model remains a viable and effective approach in modern, diverse educational landscapes.

Based on the information provided, this research explores how 'self-efficacy' and the 'Station Rotation model' interact to influence students' critical thinking and literacy skills, positing that higher levels of self-efficacy among students can significantly enhance the effectiveness of the Station Rotation model in developing these essential skills. Integrating teaching models with digital tools like Zoom Meeting in this context offers the potential for a more effective and efficient approach to conducting learning

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activities. The practical significance of this study lies in its potential to inform educational strategies, providing evidence-based insights into how enhancing students' self-efficacy can lead to better academic outcomes in critical thinking and literacy through the implementation of the Station Rotation model. To gain a deeper understanding of the research conducted, examining the accompanying concept map image (Fig. 1) is recommended. This image visually represents the research, highlighting the main concepts and ideas, and illustrating the connections between them. A concept map serves as a valuable tool for quickly grasping the essence of the research, making it easier to comprehend the relationships among various elements of the study. This approach can be instrumental in enhancing your understanding of how the Station Rotation model impacts critical thinking and literacy skills in the context of modern educational methods.

Problem ← Education plays a role in improving the quality of human resources → **Solution**

↓ ↓

Problems
1. Selection of an appropriate learning model when face-to-face situations are not possible (example: Pandemic)
2. The existing learning model still does not provide freedom of learning according to the learning styles of students

Learning Model Station Rotation

↓ ↓

Field Facts
[28]
1. Learning is only limited to assignments and lectures.
2. Learning only uses social media applications (WA)
3. Lack of activities carried out by students during learning (online)

Blended
[10]
1. Teacher-Led Instruction
2. Collaborative Activities and Station
3. Online Instruction

Full Online
[23; 47]
1. Virtual teacher-led instruction
2. Collaborative activities
3. Offline Station

↓ ↓

Consequence
1. Decreased Critical Thinking Ability
2. Decreased Literacy Ability

Advantage
1. Can be used flexibly (blended / full online)
2. Accommodate the learning characteristics of each learner
3. Provide several activities in posts that suit the learning styles of students

↓ ↓

Critical thinking
[13]
- Basic Clarification
- Bases for a Decision
- Inference
- Advance Clarification
- Auxiliary (additional) Abilities

Literacy
[43]
- Literal
- Reorganization
- Inferential Understanding
- Evaluation Understanding
- Appreciation

Previous research
1. Experimental class students have higher scores compared to control class students [19]
2. There is a positive influence on students using Station Rotation [40]
3. Learning model contributes to creating a new atmosphere for teachers and students in each lesson [6]

+

Self Efficacy
[5]
- High
- Low

↓ ↓

Self-Efficacy can affect student learning outcomes [3] → The Station Rotation Learning Model is reviewed based on the different self-efficacy applied in fifth grade elementary school learning ← **Gap Research**
There has been no research on the effect of the station rotation learning model on learning outcomes as seen from the self-efficacy of students.
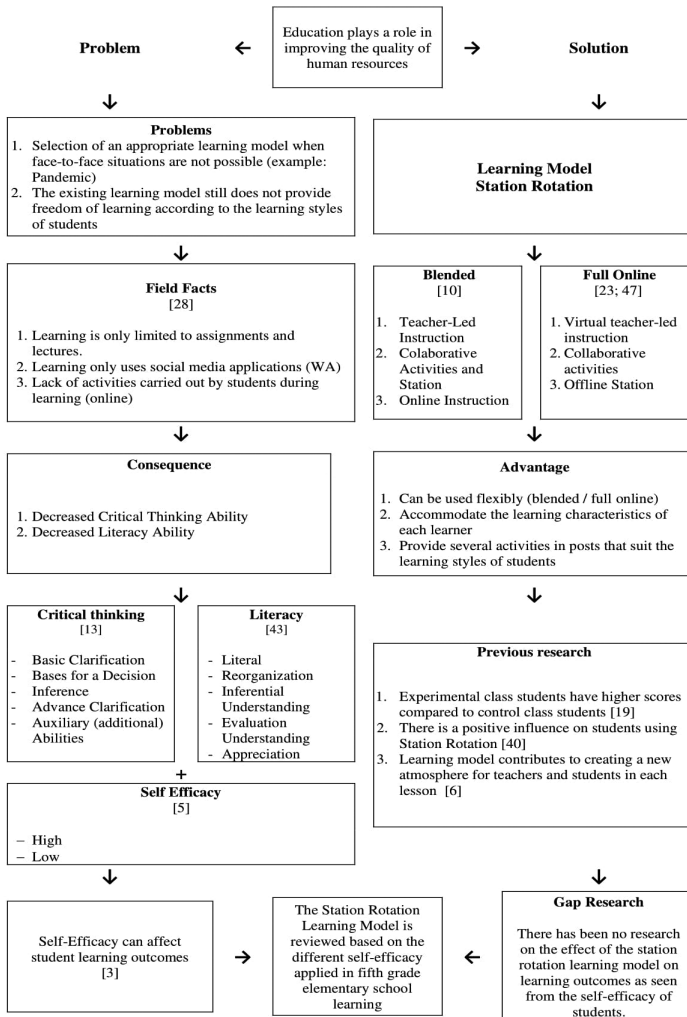
Fig. 1. Conceptual framework

Method

This study employed a quasi-experimental nonequivalent control group design, dividing the sample into two groups: the experimental group, which utilized the station rotation model, and the control group, which followed the conventional model. Both groups underwent pre-testing, but only the experimental group received the model intervention. Following the intervention, both groups were subjected to a post-test. The experiment's design was a factorial one. A factorial design was chosen because this study also took into account other independent variables, often referred to in research as moderating variables, with self-efficacy being one such variable. The factorial processing unit used was a 2x2 factorial. The design used for this research is depicted in the subsequent Fig. 2.

Participants

For this study, samples were gathered from five primary schools in Malang City, Indonesia, using a cluster random sampling method. In this approach, schools were grouped based on their respective sub-districts. This method enabled the research team to select five schools, each representing one of the five districts in Malang City. From each selected school, an experimental class and a control class were then randomly chosen. The study involved a total of 203 fifth-grade students. These participants ranged in age from 10 to 11 years, typical for fifth-grade primary school students, and included both male and female genders. This diverse sample provided a comprehensive overview of the fifth-grade student population in Malang City, allowing for a more accurate and representative analysis of the effects of the Station Rotation model on students' critical thinking and literacy skills.

Instruments

In this study, three research instruments were developed to measure self-efficacy, critical thinking skills, and reading comprehension literacy skills. The self-efficacy instrument was adapted from the research of Simon Cassidy and Peter Eachus. This instrument was specifically chosen to accurately measure the self-efficacy levels of the participants in the context of the study. For assessing critical thinking skills, an instrument comprising five essay-type ques-
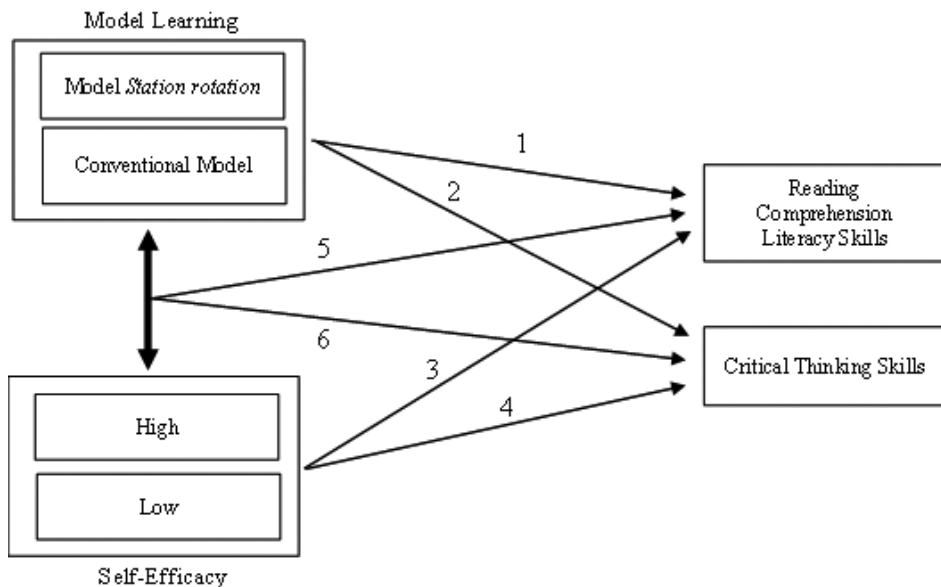

Fig. 2. 2 x 2 Factorial Design Scheme

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tions was used. Each of these questions was designed to correspond to one of the five variables of critical thinking skills being measured. This approach allowed for a detailed evaluation of the students' abilities in various aspects of critical thinking. The instrument for evaluating reading comprehension literacy skills consisted of 20 multiple-choice questions. These questions were based on text readings that were calibrated using the Simple Measure of Gobbledygook (SMOG) formula, developed by Harry Mc Laughlin [24]. The texts used were specifically chosen to match the reading level of fifth-grade primary school students, ensuring the appropriateness and relevance of the assessment. The detailed representation of each indicator for the variables measured is outlined in Table 1. This table provides a clear breakdown of how each aspect of self-efficacy, critical thinking, and literacy skills was quantitatively assessed in the study, offering a comprehensive overview of the research instruments used.

Table 1

The Representation of Each Indicator of the Variables

Variable	Indicators
Self-Efficacy [5]	Low
	High
Critical Thinking Skill [13]	Basic.Clarification
	Bases.for.a.Decision
	Inference.
	Advance.Clarification
	Auxiliary (additional) Abilities
Reading Comprehension Literacy Skill [43]	Literal
	Reorganization
	Inferential Understanding
	Evaluation Understanding
	Appreciation

Data Collection

In this study, the Station Rotation learning model was implemented, with a particular emphasis on incorporating online components. Zoom meetings were chosen as the primary digital platform for their advantageous breakout room functionality. This feature of Zoom is especially useful in the context of the Station Rotation model, as it facilitates the division of students into different groups for various activities. The breakout room functionality allowed the students to be assigned to different 'posts' or 'stations' within the virtual environment. This setup is crucial for the success of the Station Rotation model, as it mimics the physical movement between stations in a traditional classroom setting. Additionally, the flexibility for students to freely select and move between rooms in Zoom further enhanced the interactive and dynamic nature of the learning process. The duration of the study was three months, allowing for a comprehensive implementation and evaluation of the Station Rotation model in an online format. This time frame provided sufficient opportunity to observe and analyze the effectiveness of the model in enhancing students' critical thinking and literacy skills, as well as their engagement and participation in the learning process. The use of Zoom and its breakout room feature thus played a pivotal role in facilitating an innovative and effective online learning environment.

Learners participating in the experimental and control groups, which used the station rotation and traditional learning models respectively, completed a post-test. This post-test aimed to assess the students' critical thinking abilities related to the subject of animal and human movement organs. They responded to questions set by the teacher, which were designed based on critical thinking skill indicators.

Data were collected using 3 instruments, modified for the level of primary school students, including self-efficacy, pretest and posttest instruments (Critical Thinking Skill, Reading Comprehension Literacy Skill), which had been previously validated by two Ph.D. experts in Teacher Primary Education. These pretest and posttest instruments were re-validated by randomly testing 50 grade VI students (N=50) in five designated schools (10 random students each school with the same grade). Validity is measured using the Pearson Correlation, whereas reliability is calculated using the Cronbach's Alpha formula. The average score validity of the critical thinking skill instrument was 0,723, and the average

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score validity of the reading comprehension literacy skill instrument was 0,682. The value was high, so it could be said that the instrument was valid. The reliability of the critical thinking skill instrument was 0,771, and the reliability of the reading comprehension literacy skill instrument was 0,940. Therefore, it could be said that the instrument was reliable. The detailed representation of each score for the variables measured is outlined in Table 2.

After verifying validity and reliability, empirical data for the experimental group and control group was successfully collected. The traditional model used in this research is the typical teaching method employed by teachers during instruction. Consequently, the researchers did not provide any special treatment to the control group. Before starting the research, measurements were taken of the level of self-efficacy of all samples in the two groups. To quantify the degree of student self-efficacy, the self-efficacy questionnaire developed by Simon Cassidy and Peter Eachus was exemplified. The students' self-efficacy scores were then divided into two categories: high and low. The pre and post-test instruments given to students were based on tests of critical thinking and reading comprehension literacy skills. The duration of data collection for this research spanned over a period of three months, concluding with the gathering of post-test data at the end of the learning phase.

Table 2
Validity and Reliability Scores of Pretest and Posttest Instruments

Variable	Question	Score Validity (Pearson Corelation)	Sig (2-tailed)	Score Reliability (Cronbach's Alpha)
Critical Thinking Skill	1	0.726	0.000	0.771
	2	0.697	0.000	
	3	0.699	0.000	
	4	0.781	0.000	
	5	0.711	0.000	
Literacy Skill	1	0.630	0.000	0.754
	2	0.647	0.000	
	3	0.536	0.000	
	4	0.590	0.000	
	5	0.538	0.000	
	6	0.730	0.000	
	7	0.691	0.000	
	8	0.620	0.000	
	9	0.676	0.000	
	10	0.731	0.000	
	11	0.536	0.000	
	12	0.628	0.000	
	13	0.630	0.000	
	14	0.624	0.000	
	15	0.801	0.000	
	16	0.677	0.000	
	17	0.329	0.020	
	18	0.730	0.000	
	19	0.508	0.000	
	20	0.654	0.000	

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Data Analysis

Preliminary tests were conducted on the data obtained from the study. These prerequisite tests included normality and homogeneity tests. Given that the sample size of the study was more than 30, the Kolmogorov-Smirnov test was employed to assess the normality of the data. This test is commonly used in statistics to determine whether a sample comes from a specific distribution, in this case, to check if the data were normally distributed. The homogeneity of the data was tested using Levene's test method. This test is used to assess the equality of variances for a variable calculated for two or more groups. It's a crucial step in ensuring that the data meet the assumptions necessary for certain types of statistical tests. Both the normality and homogeneity tests were conducted using a significance level of 5% (0,05). This is a standard threshold in statistical testing, where a result below this level indicates that the result is statistically significant, while a result above it suggests that it's not.

After completing these preliminary tests, the study proceeded to hypothesis testing. The hypothesis was tested using Multivariate Analysis of Variance (MANOVA), following the formula described by Hahs-Vaughn [15]. MANOVA is a statistical test that is used to compare multivariate population means, and it's particularly useful in studies where multiple dependent variables are involved. This method was chosen to effectively analyze the complex data set of this study, which included multiple variables related to the effectiveness of the Station Rotation model in education. The MANOVA analysis process is assisted using IBM SPSS v.25.

Results

This study evaluated the effectiveness of the Station Rotation model, enhanced with digital tools like Zoom, on improving students' critical thinking and literacy skills. Over a three-month period, learners engaged in a structured online environment, allowing for dynamic interaction and participation. The following findings present a comprehensive analysis of the impact of this instructional model on critical thinking abilities, literacy skills, and student self-efficacy. To gain deeper insights into the influence of this learning model, the subsequent table 3 provides a summary of data including mean, standard deviation, and the number of students in each group. This table aids in the clearer interpretation of research outcomes, visualizing differences between groups, and illustrating how significantly the Station Rotation model, coupled with the use of digital tools, enhances student learning outcomes.

The study meticulously conducted a multivariate analysis on the collected data, post-validation of key assumptions such as normality and homogeneity. The assessment of normal

Table 3

Descriptive Statistics (N=203)

Dependent Variable	Model	Self Efficacy	Mean	Std. Deviation	N
Critical Thinking Skill	Experiment	Low	0.560	0.221	45
		High	0.632	0.209	60
		Total	0.601	0.216	105
	Control	Low	0.412	0.194	41
		High	0.460	0.208	57
		Total	0.439	0.203	98
Literacy Skill	Experiment	Low	0.610	0.244	45
		High	0.640	0.248	60
		Total	0.627	0.245	105
	Control	Low	0.464	0.242	41
		High	0.572	0.240	57
		Total	0.527	0.246	98

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distribution for students' N-Gain scores in critical thinking and reading comprehension literacy, influenced by the learning model was executed via the Kolmogorov-Smirnov test. In this context, the experimental group registered a normality score of 0,147 in literacy. While the control group exhibited a score of 0,200. Concurrently, in critical thinking, both groups demonstrated a score of 0,200. Given that these figures surpass the threshold value of 0,05, it was inferred that the N-Gain scores reflecting students' critical thinking and literacy aptitudes, as influenced by the learning model, adhered to a normal distribution. Furthermore, the outcomes of the homogeneity tests underscored a consistent pattern across the groups, with literacy skills showing a significance level of 0.983 and critical thinking skills presenting a level of 0,636, thereby confirming homogeneity in the data set.

The normality and homogeneity of data based on students' self-efficacy levels, were rigorously evaluated using N-Gain scores for critical thinking and reading comprehension literacy skills. The Kolmogorov-Smirnov test revealed that for critical thinking, scores at low and high self-efficacy levels were 0,089 and 0,200 respectively, while literacy skills consistently showed a score of 0,200 across both self-efficacy levels, indicating a normal distribution of data. Additionally, the homogeneity tests yielded values of 0,721 for critical thinking and 0,568 for literacy skills, confirming the homogeneity of the research data in relation to self-efficacy.

In this study, Multivariate Analysis of Variance (MANOVA) was employed to assess the impact of the instructional model and self-efficacy on two cognitive abilities: critical thinking skills and reading comprehension literacy skills.

The results obtained indicate that the instructional model adopted exerts a highly significant influence on both cognitive skills, with F values of 29,040 for critical thinking skills with a significance of 0,000 and 9,567 for reading comprehension literacy skills with a significance of 0,002. This denotes that the instructional model being tested has a strong and significant effect on enhancing both critical thinking and reading comprehension literacy skills.

Furthermore, self-efficacy perceived by the subjects also showed statistical significance in influencing both cognitive variables, with F-values of 4,099 for critical thinking skills with a significance of 0,044 and F-values of 4,035 for reading comprehension literacy skills with a significance of 0,046. This suggests that individuals' beliefs in their capabilities to learn and complete tasks related to critical thinking and reading comprehension are positively associated with improvements in these skills.

However, when the interaction between the instructional model and self-efficacy was analyzed, the results did not show statistical significance in affecting critical thinking skills (F=0,158, p=0,691) nor reading comprehension literacy skills (F=1,264, p=0,262). This indicates that there is insufficient evidence to assert that self-efficacy moderates the influence of the instructional model on the cognitive skills measured in this study. The detail of each value of the variables is as follows Table 4. For a detailed examination of the study's outcomes on participants' abilities, refer to Fig. 3, which presents the estimated marginal means for (a) critical thinking and (b) literacy skills. This figure illustrating the comparative analysis of these essential educational metrics throughout our research period.

Table 4

Tests of Between-Subjects Effects (N=203)

Source	Dependent Variable	F	Sig.	Partial Eta Squared
Model	Critical Thinking Skill	29.040	0.000	0.127
	Reading Comprehension Literacy Skill	9.567	0.002	0.046
Self-Efficacy	Critical Thinking Skill	4.099	0.044	0.020
	Reading Comprehension Literacy Skill	4.035	0.046	0.020
Model * Self-Efficacy	Critical Thinking Skill	0.158	0.691	0.001
	Reading Comprehension Literacy Skill	1.264	0.262	0.006

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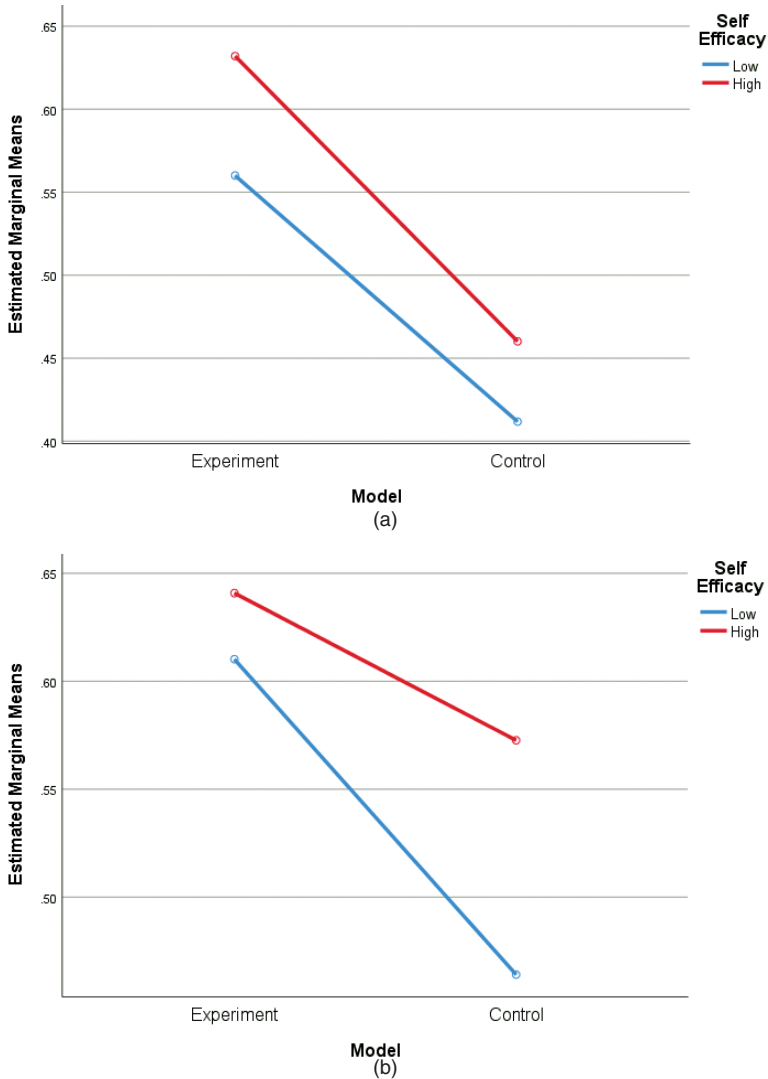
Fig. 3. Estimated Marginal Means for (a) Critical Thinking and (b) Literacy Skills

Discussion

Comparison of Critical Thinking and Literacy Ability in the Station Rotation Learning Model and Conventional Learning Model

Based on the results of the analysis using multivariate analysis, there were differences in the learning outcomes of critical thinking skills and literacy skills of students who were taught using the Station Rotation learning model compared to those taught using the conventional model. The results of the comparison of the values between the experimental and control groups showed that the learning outcomes us-

ing the Station Rotation model were higher than those using the conventional model.

The Station Rotation learning model is a unique learning model that can be implemented flexibly, in both blended and fully online learning environments [23; 47]. One of the characteristics of this learning model is the combination of problem-solving activities carried out both in groups and individually. This model also provides many benefits. Previous research revealed that learning using the Station Rotation learning model allows students to learn knowledge in their own way, according to their characteristics [19; 26]. These results were based on activities that required students to study in groups and individually.

In building and advancing students' literacy and critical thinking abilities, the Station Rotation model can be considered a favorable model. This statement can also be inferred from the results of research when the educational achievements that have been carried out have a higher posttest average value than students who learn using conventional models. The findings of this investigation align with the study conducted by Lithoxoidou [20] who suggests that technology-based learning can affect students' critical thinking ability. Studies by Budhyani [4] and Topping [46] also agree that the blended learning model gives students greater participatory discussion than the conventional model. By creating student discussion activities, it can affect thinking ability, both in the realm of primary school and even up to the college education level [41]. Similar research on the use of cooperative learning models on literacy ability from Christina [9] also confirmed that students who use the Station Rotation model get more information and knowledge than students who learn only by the conventional model.

Comparison of Critical Thinking and Literacy Ability on Self-Efficacy Level

This study obtained the results of the multivariate analysis which stated that there were differences in the results of critical thinking ability and reading comprehension literacy ability between students with high and low efficacy levels. Learning was carried out by all students who possessed critical thinking and literacy ability both with high and low degrees of self-efficacy; they all got the same portion in their learning. Students worked in a group with various characteristics (heterogeneous). Students who had high self-efficacy helped and motivated students with low self-efficacy [32; 50], so good interaction between group members was constructed in group work.

The benefit was added by a learning characteristic that was carried out by mixing various group and individual activities in one lesson. After students practiced doing group activities by discussing with each other, they then tried to solve the problems individually at different stations. This kind of pattern fostered students' confidence in getting used to solving problems both in groups and individually [34]. These results are per the research conducted by Fitriyana [14] which shows that it is easier for students to understand the material using technology-minded learning so that students' self-efficacy becomes better.

Self-efficacy not only gives an idea of the ability they have but also provides an idea to deal with and solve existing problems [3; 51]. Referring to this statement, it is implied that a person's level of self-efficacy can determine his success in solving the problems at hand. This success arises because of the ability of the individual based on the knowledge that he has previously obtained. In an ongoing learning situation, the self-efficacy variable greatly affects the learning outcomes of each individual. The findings of this investigation align with the research undertaken by Rahdar [35] which confirms that students possessing high self-efficacy will give an effort that exceeds other levels of self-efficacy in solving problems. So, students with high levels of self-efficacy have higher learning outcomes than students with low levels of efficacy.

The results of this study are also relevant to the research conducted by Syarifah [45] which concludes that the self-efficacy variable with one's critical thinking ability has a positive influence. This is because self-efficacy has a role in providing one's critical thinking ability. Individuals who have self-efficacy tend to see various problems as a challenge that needs to be solved [3; 22]. A person's critical thinking ability will emerge if he has good literacy ability as

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well. This literacy ability is needed by someone to explore various information as a provision to construct a solution by thinking deeply. The results of this self-efficacy study with literacy ability are in line with research from Cho [8] which shows that the activity of constructing a piece of information obtained to solve the problem, if it is not followed by good self-efficacy, then the projected solution cannot be conveyed properly.

Interaction between Station Rotation Learning Model and Self-Efficacy in Critical Thinking and Literacy Ability

The study results showed that there was no interaction between the learning model and self-efficacy in critical thinking and literacy ability. The learning model referred to in this result is the applied model or treatment given to students. The self-efficacy variable is a component that affects the ability of students to complete their learning. All the variables involved have no interaction with either the critical thinking or literacy ability variables. The results were as such because the independent variables and moderator variables did not have a direct relationship in influencing critical thinking and literacy ability as the dependent variables. When observed from the learning that was done, both students with high and low self-efficacy had an equal portion in carrying out learning. This statement was evidenced by the pattern of group distribution that was selected randomly or heterogeneously. In one group, there were not only students with a certain level of self-efficacy, but both levels of self-efficacy mixed together.

Focusing on learning in groups with heterogeneous members makes students more participative with each other to solve the problems given [1]. With this group division, students who have high self-efficacy indirectly help and encourage students who have low self-efficacy, facilitating seamless learning engagement. Group learning is expected to be able to encourage students to foster student engagement with peers, aligning the outcomes of this research with the learning theory proposed by Vygotsky, which states that group learning is directed as a cognitive apprenticeship to gain knowledge through interaction with more expert and more experienced colleagues [42].

Conclusion

This study revealed that there were differences in the results of students' critical thinking (sig=0,000) and literacy ability (sig=0,000) in the experimental and control groups. The next results that there were differences in the results of critical thinking ability (sig=0,046) and literacy ability (sig=0,046) in students who had low and high levels of self-efficacy because they were in group learning. Another finding was that there was no interaction between learning models with different levels of self-efficacy in critical thinking (sig=0,659) and literacy (sig=0,262) ability. The results of this study have implications especially for educators so as not to worry about the limitations of the learning model. Students can help each other according to each individual's learning style. The limitation of this study is that learning in both research groups utilizes technology (online) and uses only grade 5 primary school samples. Thus, the suggestion for further research is to combine the station rotation model with other learning media to design more effective online and offline learning with different sample variants.

Appendix 1

Self-Efficacy Instrument, English Version

Instructions

This observation sheet is used to understand the user's confidence in their ability to use information technology. Read each question carefully. Place a check mark (√) on the value that you feel most accurately reflects your feelings. The choice of values are as follows:

1 = Strongly Disagree

2 = Disagree
3 = Agree
4 = Strongly Agree

No	Question	Score			
		1	2	3	4
1	I can overcome many difficulties when using a computer				
2	I find it very easy to use a computer				
3	I am very unsure about my ability to use a computer				
4	I feel difficulties in using computer applications				
5	I am very interested in learning new applications on the computer				
6	I enjoy using a computer				
7	I do not encounter problems when running Windows applications on the computer				
8	Using a computer makes me happy to do tasks				
9	I am very confident in my ability to use a computer				
10	Learning to use a computer makes me think critically				
11	I have difficulties using the computer applications I want				
12	Sometimes I feel very confused using a computer				
13	I prefer to learn without using a computer				
14	For me, all the computer applications I have used are very difficult				
15	Sometimes I lack confidence using a computer near my friends				
16	When using a computer, I am afraid that a virus might attack my computer				
17	It seems I have difficulties when trying to use a computer				
18	Using a computer is very difficult for me				
19	Using a computer is an activity I rarely enjoy				
20	A computer is a great tool for learning				
21	I am very happy to complete tasks using a computer				
22	I feel incapable of using a computer				
23	I consider myself an expert in using a computer				
24	I am anxious that I might press the wrong button and damage the computer when using it				
25	I am confident I can use the menus and icons on the computer well				
26	I feel that learning ends too quickly when using a computer				
27	I am very confident I can complete tasks easily using a computer				
28	I prefer to ask others for help to complete tasks using a computer				
29	The menus and icons in the computer confuse me				
30	I cannot use a computer without the help of others				
Total Score					

Appendix 2

Reading Comprehension Literacy Skills Instrument, English Version

Instructions

Before you answer, make sure you understand what is being asked. Take your time to read text and each question and each possible answer. For each question, there is only one correct or most

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appropriate answer. Even if more than one answer seems correct, choose the one that best answers the question.

Indicators	Questions	Answer Key
Literal	1. The character who feels back pain and aches is... a. Sinta b. **Heru** c. Judy d. Juna	B
Literal	2. The correct position of the elbow angle when sitting is to form an angle... a. 90 degrees b. 40 degrees c. 130 degrees d. 150 degrees	A
Literal	3. The part of the body that functions to maintain body stability is... a. Foot b. Hand c. **Backbone** d. Neck	C
Literal	4. The parts of Mr Heru's body that don't feel pain are... a. Back b. Shoulder c. **Foot** d. Neck	C
Reorganization	5. The following are the consequences of improper sitting, namely... a. **Back pain** b. The body becomes weak c. Body feels light d. Eyes become tired	A
Reorganization	6. Pay attention to the following things! A. The head position should be parallel to the body B. Elbows form an 80 degree angle C. Shoulders relaxed D. Knees should be at hip level E. Back straight without support F. Knees should be perpendicular which is the correct way to sit, namely... a. A, B, C b. A, F, D c. E, D, **B** d. **A, C,** D	D
Reorganization	7. The following are activities to do while sitting, namely... a. Playing soccer b. **Working using a laptop** c. Mountain climbing d. Hoe	B
Reorganization	8. Which of the following options describes an ergonomic sitting posture, based on the text? a. Head tilted forward, shoulders tense, and arms away from the body. b. **Keep your head straight with your body, shoulders relaxed, arms at your sides, and elbows forming a 90 to 120 degree angle.** c. Sit without leaning your back, with your thighs not parallel to the chair, and your knees higher than your hips.	B

	d. The back and shoulders are arched forward, with the head turned to the side when working	
Inferential Understanding	9. The activity that caused Mr Heru to feel back pain was... a. Very hard work b. **Often spends his working time sitting** c. Likes drinking water d. Exercise often	B
Inferential Understanding	10. The following are the wrong activities when sitting, namely... a. Use an ergonomic chair b. **Twisting your back when picking up items** c. Sit with your knees at hip level d. Stretch your body when you are tired	B
Inferential Understanding	11. In paragraph 7, what is meant by the word « **This** « is... a. Ergonomic chair selection b. Rotate the body in one unit c. **Drink water** d. Small walk	C
Inferential Understanding	12. What are the consequences of not drinking enough water in terms of back pain and soreness based on the story? a. Water helps maintain electrolyte balance which reduces the risk of back pain. b. **Lack of hydration can cause muscles and bones to become dry, increasing the risk of pain.** c. Water helps in reducing body weight which indirectly reduces the burden on the spine. d. Drinking enough water can reduce mental fatigue which is often associated with back pain	B
Evaluation Understanding	13. The correct sitting position can be useful for maintaining the health of our spine. Here are other activities that we can do to ease the work of the spine, namely... a. **Take a small walk after sitting for a long time** b. Drink at least 3 glasses of water per day c. Drinking fizzy drinks d. Use a hard backrest	A
Evaluation Understanding	14. According to the story, why does improper sitting posture cause pain and soreness? a. Because it causes too much movement while working. b. **Because it causes the muscles to work harder and puts pressure on the spine.** c. Because it causes mental fatigue which affects physical condition. d. Because it causes blood circulation to become less smooth	B
Evaluation Understanding	15. What important steps should a person take to avoid pain and soreness besides improving their sitting posture? a. Avoid drinking water while working to reduce the need to move. b. Sit all day without moving to maintain posture. c. **Do regular exercise and maintain body hydration by drinking enough water.** d. Use a pillow as back support when sitting	C
Evaluation Understanding	16. Why is it important to choose the right table and chair model for work? a. To add to the aesthetics and beauty of the work space. b. In order to accommodate more work equipment. c. **To ensure comfort and support an ergonomic sitting posture.** d. To make it easier to clean and maintain office furniture	C

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Appreciation	17. Based on the reading **«Correct and Healthy Sitting Posture»,** if you don't drink water as recommended then the possibility of what will happen is... a. Excessive thirst b. Tired c. **Bones and muscles become dry** d. Back pain	C
Appreciation	18. Things that must be done so that bones and muscles function optimally are... a. **Drink 6 glasses of water per day** b. Exercise every day c. Do muscle stretches d. Rotate the body in one unit	A
Appreciation	19. Based on the reading **«Correct and Healthy Sitting Posture»,** the most appropriate activity for workers who often work in front of a laptop is... a. **Adjust the correct sitting position** b. Drink more c. Small walk d. Stand	A
Appreciation	20. What is the main message the author wants to convey through this story? a. The importance of regular exercise in daily life. b. Dangers of work involving heavy physical activity. c. The need to drink enough water for healthy bones and muscles. d. **The importance of practicing an ergonomic sitting posture to prevent back pain and aches**	D

Appendix 3

Critical Thinking Skills Instrument, English Version

Instructions

Before you answer, make sure you understand what is being asked. Read the question carefully and make sure you understand what is required. Then answer clearly!

Indicators	Questions	Answer Key
Basic Clarification	In your opinion, is it possible for us to feel back pain and soreness when receiving lessons in class? Explain your opinion!	Maybe. Because of our daily activities, we always sit for a long time in class. But if there is a group activity it may not hurt at all
Bases for a Decision	Based on the reading «Correct and Healthy Sitting Posture», is it possible that we can feel back pain and soreness when receiving lessons in class?	Maybe. Because our activities every day are always sitting for a long time. so our muscles work harder
Inference	Name 3 ways we can do so that we don't feel back and muscle pain!	Exercise every day. Don't sit for long periods of time Drink at least 6 glasses of water per day Do muscle stretches Adopt an ergonomic sitting posture
Advance Clarification	What can someone do if they have back pain? Explain your opinion!	Immediately stand up for a small walk Stretch

		Change the chair you are using to an ergonomic chair Go to the doctor
Auxiliary (additional) Abilities	With today's technology, there are many activities that can be done just sitting. so it is very easy to do the job. However, this makes someone lazy to move. so that many people's bodies feel sick and sore. What do you think about this?	With current technological advances, humans must continue to exercise and be active. A person may do work sitting, but not for long periods of time. Then it must be balanced by drinking 6 glasses of water per day

Critical Thinking Skill Assessment Rubric

Criteria	Score
Complete, correct answers, accompanied by examples and explanations of logical answers	4
The answer is correct and there is an explanation of the answer	3
Correct answer without explanation of the answer	2
Wrong answer and no reason, right answer and no reason	1
The answer is none	0

Appendix 4

Reading Text That has been Measured Using the SMOG Calculation, English Version

Correct and Healthy Sitting Posture

Sinta was surprised by Mr. Heru, who often experienced back pain and aches, even though Mr. Heru never engaged in heavy labor. He usually worked while sitting down. (1)

In the afternoon, Mr. Heru fell ill once more. (2)
"Mrs. Sinta, my back frequently aches and hurts. When I sit in a chair, I feel uncomfortable. It's not just my back, but also my shoulders and neck that often ache. Maybe my sitting posture isn't correct, huh?» said Mr. Heru. This kind of pain is also common among many office staff.

Sitting improperly can lead your muscles to overexert themselves. Take, for example, the act of sitting. Working on a laptop with poor posture, or making calls by holding the cell phone between the ear and shoulder, can lead to discomfort. This is what likely caused the pain in Mr. Heru's case. (3)

The spine is a crucial part of the body that functions to maintain stability. Given that most of our activities involve sitting, it becomes essential to understand the correct sitting posture to protect our spine. (4)

The correct sitting posture is one that is ergonomic. When sitting, your head should be aligned straight with your body. Your shoulders ought to be relaxed, with arms resting at your sides. Keep your elbows close to your body, bent at an angle between 90 to 120 degrees. Your back should be well-supported in an upright position. Ensure that your thighs and pelvis are perpendicular to the chair. Finally, your knees should be level with your hips. (5)

Even with good sitting posture, it's important not to sit for extended periods. We should make an effort to be active, taking frequent short walks. Engaging in exercise can also help in strengthening muscles and preventing them from becoming weak or stiff. (6)

When reaching for something behind us, avoid twisting the back. Instead, rotate the entire body in one smooth motion. Additionally, the water in our body helps protect our bones, so it's vital to stay hydrated. Drinking at least six glasses of water per day can prevent our muscles and bones from drying out, allowing them to remain fully functional. Another key factor is selecting the right model of table and chairs. By adhering to these guidelines, we can avoid pain and soreness even when sitting for prolonged periods. (7)

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Calculating the readability level of text based on the SMOG formula (In Indonesian Version)
Number of Sentences: 34 Sentences
which has 3 syllables: 6 words (Standard score for class 5 = 3-6 words)

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