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THE IMPACT OF USING GAMES IN THE INCLUSIVE CLASSROOM ON THE QUALITY OF INSTRUCTION

Anar Khalafov,
Doctoral Student, Azerbaijan State Pedagogical University (Baku, Azerbaijan)
ORCID ID: 0000-0001-9856-0556
anar.khlalafov@gmail.com

Abstract. The inclusion of children with special educational needs into mainstream schools alongside their typically developing peers is a societal imperative within the framework of the modern education system. Numerous studies demonstrate that employing traditional (segregate) instructional methods in an inclusive classroom is ineffective. Consequently, identifying pedagogical approaches that endorse inclusive education stands out as a pressing concern in contemporary pedagogy. The Republic of Azerbaijan starts to develop an inclusive educational system following the UN-Convention on the Rights of Persons with Disabilities, this requires new ways of teaching. In this study, the impact of games on the quality of instruction in the inclusive classroom in Azerbaijani schools was measured. To achieve this objective, the international scientific literature was scrutinized, and the factors defining the quality of education in inclusive classrooms were identified. Subsequently, the levels of these factors were assessed in experimental inclusive classrooms, where education was facilitated through games, and control inclusive classrooms, where education followed traditional methods.

Key words: quality of instruction in inclusive classroom, instructional game, game-based learning, organization of instruction in an inclusive classroom, innovative instruction for heterogenous group of children.

Introduction. Since 2020, the educational legislation of the Republic of Azerbaijan has acknowledged the right of children with special educational needs (SEN) to participate in inclusive education. Every year, the number of schools offering inclusive education is on the rise in Baku city and its surrounding regions. This trend enables dozens of children with SEN to participate in education alongside their typically developing peers. Despite significant legislative changes promoting inclusive education, traditional (segregate) educational methodologies persist in classrooms across the country.

To ensure the participation of children in instructional activities alongside their classmates within an inclusive class and the implementation of pedagogical methodologies to promote inclusive education and a culture of inclusivity in mainstream schools, national legislation specifies that children with SEN participating in an inclusive class must dedicate a minimum of 50% of their instructional hours to the inclusive setting (Regulation on Organization of Inclusive Education, 2023). However, as a consequence, we observe that children with SEN, despite being physically present in an inclusive class, often find themselves isolated from the collaborative instructional processes with their peers. It becomes evident that while modern education has succeeded in integrating children with SEN into general education classrooms, it has yet to effectively orchestrate inclusive education for children with diverse developmental levels within the instructional framework (pedagogical level) (Martin, 2013).

According to the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), the primary objectives of including children with SEN in inclusive schools are to ensure their right to participate in the social environment and access public services on equal terms with others (UNCRPD, 2006). When children with SEN are not engaged in the collaborative instructional process within an inclusive class, their interactions with peers are limited to moments before and after instructional sessions, as well as during breaks between classes. In such instances, their presence in a general inclusive environment only accounts for 13% of their total time spent at school. Considering that the instructional process encompasses, on average, 87% of the time students spend at school, it is arguable that the brief interactions during recess are insufficient for the development of their social skills

and overall integration into the classroom. Given these considerations, the participation of children with SEN in joint instructional processes within inclusive classes serves as an indicator of their active involvement in the social environment, thereby facilitating their access to quality education.

In inclusive classes, the isolation of children with SEN from their peers stemmed from teachers' preferences for segregate teaching methods and a lack of differentiation of instruction (Martin, 2013). Therefore, international law and scientific literature recommend the application of various pedagogical methods and strategies in the classroom that support internal differentiation of instruction and enable teachers to implement individual support for students. Among them, the most emphasized approaches include internal differentiation of instruction, universal design in instruction, the application of individual educational plan, student-centered learning, cooperative training, peer education, and game-based learning (The Salamanca Statement, 1994), (The United Nations Convention on the Rights of Persons with Disabilities, 2006) (Hoppey, McLeskey, 2014).

Researchers advocating for the integration of games into the instructional process contend that the incorporation of games creates fertile conditions for implementing differentiated instruction, cooperative education, and peer education (Udosen and Ekpo, 2016). Many teachers share their experiences regarding the positive impact of using games in the inclusive classroom on the quality of education in inclusive classes. Researchers assert that games foster more positive interactions between students. In a gaming environment, students can make their own decisions and assess their own results. The use of games in training allows the teacher to transition from the position of "teacher" to the role of "facilitator" (Udosen and Ekpo, 2016).

Despite numerous teachers and researchers discussing the positive effects of games in inclusive classrooms on the quality of instruction, there are very few studies measuring the impact of games on the education process (Hays, 2005). Overall, there is a lack of substantial research in the international scientific literature regarding the impact of games on the quality of instruction in inclusive classes.

To assess the effectiveness of incorporating games into the educational process, games were employed to teach relevant topics in mathematics to first-grade students in three inclusive classes across three mainstream schools in Baku. The results of these students were subsequently compared with the outcomes of other inclusive classes that were taught using traditional pedagogical methods. This comparative analysis helped elucidate the impact of games on the quality of education in inclusive classes.

Method. Within the confines of this study, an experiment was undertaken in three inclusive first-grade classrooms to assess the influence of games on the quality of instruction in inclusive settings catering to children with mild intellectual disabilities. The experiment, aligned with the first-grade curriculum, focused on four mathematics topics – "geometric figures", addition until 20 (for children with SEN until 10), subtraction until 20 (for children with SEN until 10), and counting up to 100 (for children with SEN up to 20) – taught through game-based methods over a span of six weeks. To gauge the impact of these games on instructional quality, measurements were taken before and after the intervention, comparing the effects on both typically developing children and those with SEN within the inclusive classroom. For comparative analysis, the results were juxtaposed with the impact of traditional pedagogical methods on children's performance in the same four mathematics subjects, assessed in three control classes without any intervention.

A manual was developed by the researcher for conducting games and adapting them to the needs of children with special educational needs. To ensure the participation of all students in the experimental classes in instructional games, didactic materials were prepared in quantities equal to the number of children. These materials were adapted, considering the specific needs of children with special educational needs.

The "Perception of Inclusion Questionnaire (PIQ)" (Venetz, Zurbriggen, & Eckhart, 2019), developed by Swiss researchers, serves as a tool to measure the impact of games on the quality of instruc-

tion in inclusive classrooms. It stands as the only global instrument enabling the measurement of students' emotional, social inclusion, and academic self-concept in inclusive classrooms (Venetz et al., 2014).

Questionnaire forms (for students, parents, and teachers) have been adapted to the Azerbaijani language, drawing from the English and Russian versions. The "Perception of Inclusion Questionnaire" was validated through the involvement of 10 first-grade students from secondary school in Baku, along with their parents, and 5 teachers. Necessary adjustments were implemented and incorporated into the study.

This assessment was conducted at the study's commencement and conclusion (after 7 weeks). In cases where students could not participate independently, assistance was provided by school psychologists and special education specialist. The initial assessment involved 164 students out of a total of 170, selected from six classes for evaluation in the aforementioned three areas, with 12 students having special educational needs. Among the participants, 48.2 percent were female, and 51.8 percent were male. Simultaneously, 159 parents (including 12 parents of children with special educational needs) and 6 primary school teachers responded to the questionnaire assessing the psycho-social status of 167 students at school. Due to prolonged absences from education, the remaining three students were not evaluated by their teachers.

To facilitate parental participation in the survey, detailed information was prepared and shared via digital tools. The researcher addressed questions about survey participation in both the experimental and control classes. To ensure the engagement of parents in the survey, the researcher recorded discussions in the digital tool groups and included them in the research documents.

The time span between the first and last survey was 36 days for students, 38 days for parents, and 47 days for teachers.

A written consent was received from the teachers participating in the study, as well as from the parents of the children studying in the classes involved in the research. The parents of the children in the control classes provided consent for both their children and themselves to participate in the survey, while in the experimental classes, consent was obtained from the parents for their children's instruction through games, in addition to the surveys. The research was conducted in accordance with the requirements of the Declaration of Helsinki.

The teachers in the experimental classes utilized seven-frame games for teaching geometrical figures, seventeen-frame games for addition, seventeen-frame games for subtraction, and three-frame games for counting up to 100. They introduced the games in a well-structured way and showed examples how to learn with the materials. Then the children had a time period of about 20 minutes to play the games. At the end they earned positive feedback on their learning result.

Results. The data collected through the administration of the examination instrument PIQ (from children, teachers, and parents) were analyzed for statistical reliability using the SPSS statistical program. The analysis, performed using the "Cronbach's Alpha" method, resulted in a reliability score exceeding 70 points. This score, obtained through the "Cronbach's Alpha" method, indicated statistical reliability, as illustrated in Table 1 (Keith S. Taber 2017, p. 1277).

Table 1

Reliability Statistics

Respondent	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Children	.796	.802	12
Parents	.837	.849	12
Teachers	.870	.875	12

The average results of the respondents' evaluations from the three groups on the three factors for each student in the SPSS program were categorized into two groups: children with typical development and those with SEN. Additionally, the classes were classified into experimental and control groups based on their roles in the study.

Analysis of the preliminary PİQ survey results

To assess the quality of instruction in inclusive classes before the intervention in the study framework, the PİQ survey results (means) were compared between the experimental and control groups using the SPSS program.

Quality of instruction for typically developing students in experimental and control classes (a preliminary PIQ survey analysis)

From the mean results (see Table 2), it is evident that there is no significant difference in the outcomes of typically developing students, parents, and teachers in both experimental and control inclusive classes. Additionally, in both groups, students, teachers, and parents consistently rated the social inclusion of students in school the highest. Furthermore, respondents from all three groups in both experimental and control groups provided the lowest scores for students' academic self-concept levels. Based on the factors mentioned, we can assert that the active participation of students in the learning process, which serves as an indicator of the quality of training for typically developing children in inclusive classes, is more effectively organized than the adaptation of instruction to their needs. Additionally, teachers in control classes rated typically developing students higher than students in experimental classes regarding academic self-concept (average for teachers in control classes = 11.35 (SD = 3.54), average for teachers in experimental classes = 10.23 (SD = 3.61)). Consequently, the instruction in control classes was found to be better suited to the needs of typically developing students compared to students in experimental classes.

Table 2

Results of the initial PİQ survey (means)

Type of classes	Type of children	Respondents/factors								
		SEMİ	**SSOI**	**SASC**	**PEMI**	**PSOI**	**PASC**	**TEMI**	**TSOI**	**TASC**
eksperimental	typically developing children	13.49	13.77	11.47	14.09	14.68	11.97	14.01	13.99	10.23
	children with SEN	12.33	11.67	6.33	13.00	12.50	7.50	11.50	11.67	5.00
control	typically developing children	14.07	14.27	12.08	14.41	14.96	12.07	13.07	14.19	11.35
	children with SEN	12.17	11.33	7.33	13.33	11.67	7.67	10.00	9.83	7.00

Note. Respondents/Factor section describes students' self-assessment (SEMI – emotional inclusion, SSOI – social inclusion, SASC – academic self-concept), parents' report (PEMI – emotional inclusion, PSOI – social inclusion, PASC – academic self-concept), and teachers' report (TEMI – emotional inclusion, TSOI – social inclusion, TASC – academic self-concept).

The results of typically developing students studying in experimental and control classes, as well as those of their parents and teachers, were analyzed using an independent-samples t-test in the SPSS program. Based on the obtained results, it was determined that, from a statistical perspective, the quality of education for typically developing students in experimental and control classes does not differ significantly, except for the results of teachers regarding the academic self-concept factor of students (Sig. = 0.055).

Quality of instruction for children with SEN in experimental and control classes (a preliminary PIQ survey analysis)

Based on the preliminary results of the PIQ survey involving children with SEN, their parents, and teachers, it was observed that, with the exception of teachers in the experimental classes, the emo-

tional inclusion of children with SEN at school is superior to the other two factors (refer to Table 2). Social inclusion ranked in the second place, and the academic self-concept level of students was evaluated even lower than the other two factors. The results (see Table 2) indicate that all three groups of respondents rated the academic self-concept of children with SEN significantly lower than the other two factors. While emotional and social inclusion partially suggests higher levels of participation in the instructional process for SEN children, the low academic self-concept results indicate significant challenges in adapting instruction to their needs.

Teachers rated the quality of education for children with SEN lower on three factors than students themselves and parents. When asked about the reasons for this, teachers explained that, despite the students with SEN, their expectations regarding psycho-social outcomes are the same as those for other students. Simultaneously, it was found that the self-evaluation results of students with SEN in experimental classes on the academic self-concept factor, as well as their teachers' assessments of the students on that factor, were lower than the results of the control group. It can be argued that the students' low self-esteem on this factor is directly linked to teachers' lower assessments of their educational success. Studies conducted in this direction suggest that adapting instruction to students has a positive effect on the level of academic self-concept of students (Alnahdi, Lindner, and Schwab, 2022).

The results of students with SEN studying in experimental and control classes, as well as those of their parents and teachers, were analyzed using an independent-samples t-test in the SPSS program. Based on the obtained results, it was determined that, except for the results of teachers on the academic self-concept factor of students (Sig. = 0.042), there is no statistically significant difference in the results of students, parents, and teachers on other factors regarding the quality of instruction for SEN students in experimental and control classes.

Quality of instruction for children with SEN alongside typically developing classmates (a preliminary PIQ survey analysis)

Within the framework of the study, before intervening in the training process in the experimental classes, a comparative analysis of the level of ensuring active participation and adapting instruction to the needs of students in both groups was conducted by comparing the results of typically developing students with the results of classmates with SEN (see Table 2).

As evident from the results, both in the experimental and control groups, the quality of education for children with SEN is perceived to be lower compared to typically developing students, according to all respondents. Among the three factors serving as indicators of instructional quality, the emotional inclusion of children with SEN is observed to be on par with typically developing students in inclusive classes. However, the lowest result is determined to be in the academic self-concept factor of children with SEN. The low level of academic self-concept among children with SEN indicates the presence of significant challenges in adapting instruction to their needs within the classes.

The results of students with typical development and SEN, along with their parents and teachers in the classes included in the study, were analyzed using an independent-samples t-test in the SPSS program. Based on the obtained results, it was determined that there is no statistically significant difference in the results of the students themselves and their parents regarding the emotional inclusion of SEN children and typical students in the experimental classes (students' results Sig = 0.242; parents' Sig = 0.250). However, according to the results of respondents on other factors, the quality of education for typical children is statistically significantly different compared to SEN children. In the control classes, except for the results of the parents on emotional inclusion (Sig = 0.203), respondents on other factors indicated that the quality of education for typical children was statistically significantly different from that of SEN children.

Discussion on the results of the preliminary PIQ survey

Based on the preliminary results of the PIQ survey, it can be concluded that the quality of instruction in both experimental and control classes is at the same level for both groups. The emotional

and social inclusion of typically developing students in both experimental and control classes is satisfactory, but the academic self-concept level of students is lower compared to the other two factors. This suggests difficulties in adapting instruction according to the individual needs of the students.

The scores of SEN children on the three factors, below those of their typically developing classmates, indicate discrimination and a lack of full inclusion in the classes. Despite relatively high indicators of emotional inclusion in SEN children, it implies that, in inclusive classes, children from this category receive more support for integration into the social environment, but they are not provided with quality instruction–a fundamental requirement of inclusive education. This is evident as the results of respondents on academic self-concept are statistically significantly lower compared to typical children. In this case, the education carried out in the classes where the research is conducted can be termed as more integrated education rather than inclusive education. In inclusive education, the crucial aspect is to provide quality instruction tailored to the potential of each student (Convention on the Rights of Persons with Disabilities and Optional Protocol, 2006).

Final PİQ survey

The final survey was administered once again, seven weeks later, after the four math topics were delivered through games. A total of 155 students in the 6 selected inclusive classes (including 12 children with disabilities) participated in the final PIQ survey. Among these participants, 47.1% were girls, and 52.9% were boys. In the survey, 157 parents (including 12 parents of children with special educational needs) and 6 teachers answered questions about the quality of their children's education at school. Due to the prolonged absence of six students, teachers were unable to assess them.

The results of the final assessment of the PIQ survey were analyzed using the SPSS program. To analyze the data, the results (means) on the three factors related to the quality of instruction in the inclusive classroom (students' emotional and social inclusiveness, and their academic self-concept) were analyzed. For further analysis, the data of typically developing students in the inclusive classroom were examined separately from the data of children with SEN (Table 3).

Table 3

Results of the final PİQ survey (means)

Type of classes	Type of children	Respondents/factors								
		SEMİ	**SSOI**	**SASC**	**PEMI**	**PSOI**	**PASC**	**TEMI**	**TSOI**	**TASC**
eksperimental	typically developing children	15.34	14.87	13.09	15.37	15.51	12.71	15.06	14.84	11.10
	children with SEN	14.50	14.00	8.00	14.50	13.83	8.33	12.83	12.83	5.67
control	typically developing children	13.26	13.80	11.82	13.45	14.42	11.33	12.59	13.69	10.74
	children with SEN	11.33	10.67	7.00	11.67	10.67	6.50	9.33	8.83	6.17

Note. Respondents/Factor section describes students' self-assessment (SEMI – emotional inclusion, SSOI – social inclusion, SASC – academic self-concept), parents' report (PEMI – emotional inclusion, PSOI – social inclusion, PASC – academic self-concept), and teachers' report (TEMI – emotional inclusion, TSOI – social inclusion, TASC – academic self-concept).

Quality of instruction for typically developing students in experimental and control classes (final PIQ survey analysis)

From the mean results (refer to Table 3), it is evident that there is no significant difference within the groups of typically developing students, parents, and teachers studying in experimental and control inclusive classes. However, notable differences emerge in the results between the groups (experimental and control). The results of typically developing children studying in all experimental classes, where mathematics was taught through games, exhibit substantial disparities from the results of the control classes taught using the traditional method.

Upon analyzing the group results through an independent-samples t-test, it was determined that, before the intervention, there was no statistically significant difference in the results of students studying in experimental and control classes, as well as their parents and teachers, on the three factors. However, post-intervention, according to the results of all three groups of respondents, there is a statistically significant difference between the experimental and control classes on all factors, with the experimental classes demonstrating superiority.

Quality of instruction for children with SEN in experimental and control classes (final PIQ survey analysis)

Analyzing the final results of the PIQ survey, it was determined that the difference in the results of the respondents in the three categories within the group is not noticeable. The results of SEN children studying in the experimental class on three factors (excluding the results of teachers on the academic self-concept factor) are higher than those of SEN children studying in control classes (see Table 3).

By analyzing the results of SEN children studying in both groups of classes with an independent-samples t-test in the SPSS program, it was determined that in the results of the preliminary survey, except for the academic self-concept factor of the students of SEN children studying in control classes, according to the results of the teachers (Sig = 0.042), the three categories of respondents based on the results of the three factors, it was determined that there is no statistically significant difference in the quality of instruction ($P<0.05$).

According to the results of the final PIQ survey, with the advantage of experimental classes, students' emotional (Sig = 0.030) and social (Sig = 0.027) inclusion on self-assessment, students' emotional inclusion on parents' report (Sig = 0.016), and their academic self-concept level (Sig = 0.012), according to teachers' reports, emotional (Sig = 0.024) and social (Sig = 0.049) inclusion of students statistically significantly differ from the results of SEN children studying in control groups.

The fact that both groups of children (experimental and control), which collected the same level of results on all three factors in the initial PIQ survey, achieved sharp changes on all three factors after 7 weeks can act as an indicator of the high impact of games on the quality of instruction.

Quality of instruction for children with SEN alongside typically developing classmates (a preliminary PIQ survey analysis)

As a result, a greater sense of equality is experienced between typically developing students and children with SEN in the experimental classes compared to the control classes. In the control classes, on the contrary, a visible contrast between the two categories of students is evident (see Table 3). The results of the PIQ survey for typically developing students were compared with the results of their classmates with SEN using an independent-samples t-test. The results of the analysis showed that, in the initial survey results in the experimental classes, only the emotional inclusion factor in students' self-evaluation (Sig = 0.242) and in the parents' report (Sig = 0.250) did not indicate a statistically significant difference between typically developing students and their classmates with special educational needs. In the final results, the self-evaluation results of children with SEN on emotional inclusion (Sig = 0.110) and parents' report on emotional inclusion (Sig = 0.130), along with the additional social inclusion factor on SEN children's self-evaluation (Sig = 0.193), became equal to the results of typically developing students.

In the initial results of the an independent-samples t-test for the PIQ survey in the control classes, it was determined that, according to parents' reports, there is no statistically significant difference in emotional inclusion between typically developing students and their classmates with SEN (Sig = 0.203). However, the results from other respondents show a significant difference in the quality of instruction between the two categories of students in the control groups ($P<0.05$). Based on the results of the final PIQ survey, a statistically significant difference was found between the results of all respondents on three factors between typically developing students and children with SEN in control classes ($P<0.05$).

We can argue that this, in turn, is the result of the negative impact of the quality of instruction for children with SEN when training is conducted in an inclusive classroom with traditional methods. This approach does not support the increase of their active participation in the training process and the adaptation of instruction to their needs.

Difference between initial and final PIQ survey results in experimental and control classes

Since there is no significant difference between the intra-group results (experimental and control) of both categories of students, their parents, and teachers in the classes where the PIQ survey was conducted, the next stage will focus on analyzing only the results of the students in terms of the difference between the initial and final surveys. This limitation is imposed by the constraints on analysis and the allocated limit for the article.

Analysis of the results of the initial and final surveys in experimental and control classes using the paired-samples t-test in the SPSS program indicated that the final survey results in experimental classes surpassed those of the initial survey. Conversely, in the control classes, the average scores of students decreased during the final survey compared to the initial survey (see Table 4).

Table 4

Paired-samples t-test results (typically developing children)

Factors	Pairs	Type of classes	Phase	Mean	N	Std. Deviation	Std. Error Mean
SEMİ	Pair 1	experimental	Pre-test	13.84	74	2.041	.237
			Post-test	15.43	74	1.086	.126
	Pair 2	control	Pre-test	13.74	66	2.186	.269
			Post-test	13.26	66	2.562	.315
SSOI	Pair 3	experimental	Pre-test	13.92	74	1.964	.228
			Post-test	14.93	74	1.502	.175
	Pair 4	control	Pre-test	14.17	66	1.828	.225
			Post-test	13.80	66	1.963	.242
SASC	Pair 5	experimental	Pre-test	11.81	74	2.304	.268
			Post-test	13.24	74	2.092	.243
	Pair 6	control	Pre-test	12.121	66	2.6920	.3314
			Post-test	11.818	66	2.6999	.3323

Note. Factor section describes students' self-assessment (SEMI – emotional inclusion, SSOI – social inclusion, SASC – academic self-concept)

Based on the paired-samples t-test, a positive trend was observed between the baseline and end results of the PIQ survey in the experimental classes, whereas a negative trend was evident in the control classes for children with SEN compared to their typical developing classmates (see Table 5).

It was not possible to establish the statistical significance of the effect using the paired-samples t-test in SPSS program, given the presence of negative dynamics (non-normal distribution of data) in the results of the PIQ survey in the control classes. To assess the effect of the experiment using the PIQ survey results, the SPSS program, designed for the analysis of non-normally distributed data, employed the statistical method known as the "non-parametric test", specifically the "Wilcoxon Signed Rank Test".

To analyze the positive and negative differences between the responses to the initial and final questionnaires across the three factors of the PIQ survey, a nonparametric test–the Wilcoxon signed-rank test–was employed. Its purpose is to assess whether the observed change in the experimental classes is statistically significant. Simultaneously, the test aims to ascertain whether any negative dynamics observed in the control classes are merely random or represent a statistically significant effect.

Table 5

Paired Samples Statistics (children with SEN)

Factors	Pairs	Type of classes	Phase	Mean	N	Std. Deviation	Std. Error Mean
SEMİ	Pair 1	experimental	Pre-test	12.33	6	1.366	.558
			Post-test	14.17	6	1.472	.601
	Pair 2	control	Pre-test	12.17	6	2.401	.980
			Post-test	11.33	6	2.733	1.116
SSOI	Pair 3	experimental	Pre-test	11.67	6	.816	.333
			Post-test	13.50	6	1.049	.428
	Pair 4	control	Pre-test	11.33	6	3.141	1.282
			Post-test	10.67	6	2.944	1.202
SASC	Pair 5	experimental	Pre-test	7.17	6	1.941	.792
			Post-test	8.17	6	1.472	.601
	Pair 6	control	Pre-test	7.333	6	2.5033	1.0220
			Post-test	7.000	6	2.1909	.8944

Note. Factor section describes students' self-assessment (SEMI – emotional inclusion, SSOI – social inclusion, SASC – academic self-concept)

Analysis of the impact of using games in the inclusive classroom on the quality of instruction

To assess the quality of instruction in the evaluated inclusive classrooms, the Wilcoxon Signed Rank Test method was applied to examine the positive and negative dynamics of students before and after exposure on the three factors (emotional inclusion, social inclusion, and academic self-concept) measured by the PIQ survey.

According to the initial and final results of the PIQ survey analyzed with the Wilcoxon Signed Rank Test, 49 typically developing students in the experimental classes exhibited positive dynamics in emotional inclusion, while 2 showed negative dynamics. In contrast, during the 7-week training period in the control classes, an increase in negative dynamics on the emotional inclusion factor of typically developing students was observed. In the control classes, 29 students demonstrated negative dynamics between the initial and final surveys, while only 13 students showed positive dynamics in emotional inclusion.

Regarding social inclusion, positive dynamics were recorded in 41 students with typical development and negative dynamics in 4 students in the experimental classes. However, in the control classes, negative dynamics in the results of typically developing students on social inclusion still prevailed. In these classes, 24 typically developing students showed negative dynamics, while 17 demonstrated positive dynamics.

For the academic self-concept factor, positive dynamics again prevailed among students in experimental classes (48 vs. 13 students), while negative dynamics were more common in control classes (29 vs. 19 students).

The results of the PIQ survey for children with SEN are comparable to those of their typically developing peers. Regarding emotional inclusion, positive dynamics were observed in 5 pupils with SEN in the experimental classes between the initial and final questionnaires in the PIQ survey. None of them exhibited negative dynamics on this factor. In contrast, among children with SEN in the control classes, only 1 showed positive dynamics, while 4 displayed negative dynamics.

In the experimental classes, positive dynamics were observed in the social inclusion of 5 students at various ranks, with no recorded instances of negative dynamics. Conversely, in the control classes, social inclusion for students exhibited negative dynamics in 3 instances, and the absence of positive dynamics was noted.

In the experimental classes, 3 students with SEN demonstrated positive dynamics on the academic self-concept factor, with no instances of negative dynamics noted. In the control classes, there were 2 instances of negative dynamics observed on this factor, and no positive dynamics were recorded.

Following the analysis of the PIQ survey results using the Wilcoxon Signed Rank Test, a statistically significant and non-random positive change was identified in the emotional and social inclusion scores, as well as in their academic self-concept, among students in the experimental classes.

Table 6

Test Statisticsa (typically developing students)

	Emotional inclusion		Social inclusion		Academic self-concept	
	Experimental classes	Control classes	Experimental classes	Control classes	Experimental classes	Control classes
Z	-5.978 b	-2.194 c	-4.811 b	-1.599 c	-4.533 b	-1.216 c
Asymp. Sig. (2-tailed)	.000	.028	.000	.110	.000	.224

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks
c. Based on positive ranks

Furthermore, it was observed that negative trends in the quality of instruction persisted for 7 weeks among typically developing students studying in control classes. The positive and negative results of the PIQ questionnaire on factors of social inclusion and academic self-concept in control classes were found to be random and statistically insignificant (Table 6). Simultaneously, based on the indicator of emotional inclusion among typical children in control classes, negative dynamics were observed in 29 out of 66 students, while positive dynamics were noted in 13 students. After 7 weeks, the negative trends in the level of emotional inclusion among students in the control group were confirmed as non-random and statistically significant (Sig = 0.28) (Table 6).

The results of teaching children with SEN in the experimental classes showed statistically significant positive changes in the factors of emotional and social inclusion according to the PIQ survey. However, it was observed that positive changes in the factor of students' academic self-concept (positive dynamics in 3 students) were not statistically significant (Table 7).

Despite the prevalence of negative dynamics in three factors of the PIQ survey among children with SEN studying in control classes, their statistical significance was not confirmed. Consequently, the absence of statistically significant changes in the quality of education for students with SEN in control classes over the course of 7 weeks was confirmed (Table 7).

Table 7

Test Statisticsa (children with SEN)

	Emotional inclusion		Social inclusion		Academic self-concept	
	Experimental classes	Control classes	Experimental classes	Control classes	Experimental classes	Control classes
Z	-2.070b	-1.414c	-2.041b	-1.633c	-1.633b	-1.414c
Asymp. Sig. (2-tailed)	.038	.157	.041	.102	.102	.157

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks
c. Based on positive ranks

Conclusions. Through this research, the collected empirical data has affirmed that conducting the teaching of subjects in inclusive classes with the involvement of children with mild intellectual disabilities through games enhances the quality of instruction. The research has established the following factors that substantiate the impact of games on improving the quality of instruction in the inclusive classroom.

As a result of the "PIQ survey" conducted in both experimental and control classes as part of the study, it was determined that the emotional and social inclusion of typically developing students, as well as children with special educational needs, studying in experimental classes, changed significantly for the better compared to those in control classes, from a statistical standpoint.

When investigating the cause of the negative dynamics in the quality of education for children with typical development and SEN in control classes, it was discovered that students repeated subjects studied at the preparatory school level during the first half of the academic year. The commencement of intensive teaching of new subjects in the second half of the academic year had a detrimental impact on the students' workload and overall instructional quality. Simultaneously, the rise in seasonal illnesses during February and March resulted in issues related to students' attendance, leading to frequent class absences. The problem of poor attendance adversely impacted the quality of their education.

As in the control classes, students of experimental classes had a problem in planning the educational program, as well as in the attendance of classes. While students in the experimental classes encountered the same level of difficulty as those in the control classes, a statistically significant positive improvement in the quality of their learning was observed.

Simultaneously, the emotional and social inclusion of children with SEN studying in experimental classes indicates that they achieve results not only significantly higher than they pre-test results. According to the post-test results of the PIQ survey for children with SEN in the experimental classes, it is evident that they are keeping pace with typically developing students in terms of emotional and social inclusion (participation in joint instruction). In the control classes, there is a significant difference in these factors within typically developed children and children with SEN. It has been determined that equalizing the opportunities for children from these two categories (typically developed and SEN children) in one class plays a crucial role in conducting instruction through games. This is because games create conditions for joint activity among students in the instructional process.

The positive advancement in the emotional and social inclusion of students in the experimental classes is attributed to their favorable relationships with both peers and teachers, their full engagement in the instructional process, and their acceptance as integral members of the class. Considering these factors, empirical research has confirmed that the use of games serves as an indicator of the quality of instruction in the inclusive classroom, supporting active participation for students in both categories within the experimental classes.

Factor III of the "PIQ survey", specifically "Students' academic self-concept," was employed as the primary criterion for evaluating the level of adaptation of instruction to students' needs. The rationale behind prioritizing this factor lies in the belief that when the instructional process is tailored to the student, they are more likely to succeed in their academic endeavors, subsequently enhancing their self-esteem and fostering a sense of accomplishment in their studies (Alnahdi, Lindner, and Schwab, 2022). Simultaneously, drawing on the principles of "Programmed learning" grounded in behaviorism theory, adapting the instructional process to the student allows them to effectively engage in tasks, leading to increased motivation, which, in turn, stimulates the acquisition of new knowledge and skills (Chen, 2011). Consequently, aligning instruction with the needs of the learner is anticipated to yield improved learning outcomes.

The final results of the "PIQ survey" were analyzed, revealing a statistically significant positive change in the level of academic self-concept among typically developing students during the research period. Utilizing Wilcoxon's "Signed Difference Test", it was observed that there were both posi-

tive and negative dynamics in the levels of academically successful students in the control classes. However, the observed change was not statistically significant and appeared to be random.

In the "PIQ preliminary survey" conducted in both experimental and control classes as part of the study, it was found that the level of academic self-concept among children with SEN is lower than that of typical children. In the intergroup comparison (experimental and control), there was a slight difference in this factor.

When the academic self-concept levels of children with SEN were examined based on the final PIQ survey, despite observing positive dynamics in the experimental classes and negative dynamics in the control classes, the change in this category of children from both groups was not deemed statistically significant and was determined to be random.

Considering the above, the educational outcomes of both categories of children in the experimental classes are statistically significantly different from the results of students studying in the control classes. Furthermore, given the high level of academically self-concept observed in students when subjects are taught through games, it can be asserted that research has demonstrated the appropriateness of adapting instruction through games to meet the needs of students compared to traditional pedagogical methods.

At the same time, based on the results of the PIQ survey, we can assert that instruction conducted through games may be more effectively adapted to typical developed children than to children with SEN. Thus, while the results of academic self-concept for typical children studying in experimental classes were confirmed to be statistically significant, the statistical significance of this difference was not confirmed in the results of children with SEN in experimental classes.

Taking into account the preliminary results of the PIQ survey, which indicated little difference in the quality of student instruction across the three factors between the classes, and considering that the only change in the learning process in these groups was the introduction of learning through games, it can be argued that the use of games in learning has a more positive impact on the quality of instruction compared to traditional pedagogical methods. In fact, games in the experimental classrooms were found to positively impact the instruction of all children in the classroom, not just those who are typically developing or have special educational needs. Additionally, the utilization of games in teaching is assessed as an effective pedagogical method to alleviate the workload during students' study programs and mitigate potential emotional stress in classes.

While teachers acknowledge the positive impact of games on students' education, the research revealed certain reasons for them continuing to employ traditional pedagogical methods.

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