

Innovative Teaching of the Course “Inclusive Education. Hospital Pedagogy” in Higher Education: A Quasi- Experimental Study in Three Uzbek Universities

Alpamis Bakhtiyarovich Amangeldiev¹, Islomjon Hatamjon o'g'li Haydarov², Iqboloy Sodikjonovna Isodullayeva³, Shakhnoza Yerpolat kizi Ibraymova⁴

¹Doctoral student, Teaching Assistant, Department of Pedagogy and Psychology, Tashkent State Medical University, Tashkent, Uzbekistan. E-mail: alpamisamangeldiev80@gmail.com; ORCID: <https://orcid.org/0009-0008-1534-6799>

²PhD in Pedagogical Sciences, Department of Special Pedagogy, Kokand State University, Kokand, Uzbekistan. E-mail: haydarovislomjon359@gmail.com; ORCID: <https://orcid.org/0009-0009-2013-3007>

³PhD in Pedagogical Sciences, Teaching Assistant, Department of Inclusive Education, Fergana State University, Fergana, Uzbekistan. E-mail: iqboloy006@gmail.com; ORCID: <https://orcid.org/0009-0005-9923-0328>

⁴Trainee Teacher, Department of Preschool Education and Defectology, Nukus State Pedagogical Institute, Nukus, Karakalpakstan, Uzbekistan. E-mail: shaxnoza.ibraymova@ndpi.uz; ORCID: <https://orcid.org/0009-0006-2047-2779>

Abstract. The study examines the effectiveness of an innovative methodology for teaching the course “Inclusive Education. Hospital Pedagogy” to future special educators. A quasi-experimental design with experimental and control groups was implemented at Ajiniyoz Nukus State Pedagogical Institute, Kokand State University and Kimyo International University in Tashkent (n=354). The baseline survey showed that innovative methods were used regularly according to only 24.0% of students, interactive digital tools according to 16.7%, and problem-, team- and case-based learning according to 14.1%. Over three months the experimental group (n=178) studied with a four-component model integrating KISS, LOIT and flipped-classroom technologies, PBL/TBL/CBL, role play, simulation and gamified tools (Kahoot, Wordwall, Wheel of Names). After the intervention, 89.3% of experimental students rated the methods as more effective than traditional ones. On identically worded items the experimental group differed significantly from the control group (91.6% vs 34.1%, $\chi^2=125.4$, $p<0.001$, Cramér's $V=0.60$). The model can be recommended for special-education programmes.

Keywords: inclusive education; hospital pedagogy; children with long-term illness; innovative methods; gamification; flipped classroom; problem-based learning; case-based learning; future special educators.

Introduction

The right of every child to quality education, including children with disabilities and children who require long-term medical treatment, is one of the core principles of contemporary education policy. The UN Convention on the Rights of Persons with Disabilities obliges states to ensure an inclusive education system at all levels [1], and UNESCO's Global Education Monitoring Report emphasises that inclusion means removing barriers for all learners, whatever their health status [2]. Children undergoing prolonged in-patient or out-patient treatment are a

particularly vulnerable group: interruptions in schooling, social isolation and emotional strain put them at risk of falling behind their peers.

Uzbekistan has taken important steps in this direction. Article 20 of the Law “On Education” (2020) defines inclusive education and allows children in need of long-term treatment to be educated in medical institutions or individually at home [3]. Cabinet of Ministers Resolution No. 638 of 12 October 2021 regulates general secondary education for children receiving in-patient treatment for more than 30 days [4], and Resolution No. 134 of 29 March 2023 provides for the gradual establishment, in 2023–2028, of branches of the “Mehrli maktab” (Caring School) in state medical institutions for children in haematology, oncology and clinical immunology [5]. These reforms create a growing demand for teachers trained to work in hospital settings.

The course “Inclusive Education. Hospital Pedagogy” is the main vehicle through which future special educators acquire this competence. However, the course is still taught largely through lectures and reproductive seminars, while the professional situations it prepares students for – adapting content to a child’s medical condition, cooperating with medical staff and families, using assistive and digital tools – require active, practice-oriented learning.

The aim of this study was to develop an innovative methodology for teaching “Inclusive Education. Hospital Pedagogy” and to test its effectiveness experimentally. The objectives were: (1) to assess the current state of teaching the course in three universities; (2) to design a teaching model that integrates modern pedagogical technologies and digital tools; (3) to compare students’ evaluations in experimental and control groups after the intervention.

Literature Review

Research on inclusive pedagogy has shifted from a focus on individual deficits to the design of learning environments that work for everyone. L. Florian and K. Black-Hawkins describe inclusive pedagogy as extending what is ordinarily available to all learners rather than providing separate “special” activities for some [6], and M. Ainscow shows that inclusion depends on teachers’ capacity to respond to diversity in everyday practice [7]. For teacher education, this means that future specialists must experience active and differentiated methods themselves.

Hospital pedagogy has its own body of research. M. Capurso and J.L. Dennis identify continuity of schooling, individualisation, cooperation between school, hospital and family, and attention to the child’s emotional state as key educational factors for students with medical conditions [8]. S.M. Steinke and colleagues, examining hospital school programmes, note the shortage of teachers specifically prepared for this context [9]. In the Russian-language tradition, V.P. Kashchenko’s “hospital (therapeutic) pedagogy” and the contemporary “UchimZnayem” network of hospital schools stress a humane attitude to the sick child and the creation of a full educational environment inside the clinic.

A substantial evidence base supports the active methods used in this study. C.E. Hmelo-Silver shows that problem-based learning (PBL) develops flexible knowledge and problem-solving skills [10]; L.K. Michaelsen and co-authors describe team-based learning (TBL) as a structured way to turn small groups into learning teams [11]; and a BEME systematic review by J.E. Thistlethwaite et al. found that case-based learning (CBL) is valued by students and links theory to professional practice [12]. A meta-analysis by S. Freeman et al. demonstrated that active learning substantially improves student performance compared with traditional lecturing [13]. Flipped-classroom models move the transmission of content outside the classroom and use contact time for application [14].

Gamification – the use of game design elements in non-game contexts [15] – has been shown in a meta-analysis by M. Sailer and L. Homner to have small-to-medium positive effects on cognitive, motivational and behavioural outcomes [16]; a review by A.I. Wang and R. Tahir found that Kahoot! in particular improves engagement and classroom dynamics [17]. Finally, cognitive load theory [18] provides the rationale for presenting complex defectological concepts in a concise, structured form, which in our model is operationalised

as the KISS (“Keep it short and simple”) technology. Despite this evidence, no studies were found that integrate these approaches into the teaching of hospital pedagogy in Uzbek universities, which defines the gap addressed here.

Materials And Methods

Design and participants. The study used a quasi-experimental design with experimental and control groups and two stages (ascertaining and formative). It involved 354 students majoring in special pedagogy and speech therapy: 121 at Ajiniyoz Nukus State Pedagogical Institute (61 experimental, 60 control), 123 at Kokand State University (62 and 61) and 110 at Kimyo International University in Tashkent (55 and 55). In total, the experimental group comprised 178 and the control group 176 students. Groups were formed from existing academic groups; the groups with lower prior academic performance were assigned to the experimental condition.

Intervention. Over three months the experimental group studied the course according to the model presented in Table 1, while the control group was taught by the traditional method (lectures and reproductive seminars).

Table 1 Components of the innovative model for teaching “Inclusive Education. Hospital Pedagogy”

Component	Content and tools
Target	Readiness to organise pedagogical activity in hospital and inclusive settings: knowledge of the theory of hospital pedagogy, analysis of individual needs, adaptation of content, purposeful use of digital tools, ethical decision-making, cooperation with medical staff and families
Content	Updated syllabus, case collection based on real clinical-pedagogical situations, independent study assignments, infographics and short videos (KISS), digital resources aligned with learning objectives (LOIT)
Process	Flipped classroom; PBL, TBL and CBL; role play and simulation of hospital lessons; gamified consolidation with Kahoot, Wordwall (e.g., “Match up” terminology tasks) and Wheel of Names
Diagnostic and evaluative	Entry and exit questionnaires, formative quizzes, assessment of case solutions and reflective tasks

Source: developed by the authors.

The model is based on seven principles: inclusiveness, individualisation, flexibility, digital accessibility, cooperation (teacher, medical staff, parents, psychologist), continuity of learning during and after treatment, and safety and confidentiality of medical information. Clinical decisions, treatment regimens and physical load remain within the competence of medical staff; the timing and format of lessons are adapted to the child’s condition.

Example of a lesson. In the lesson “Content, essence and methodological foundations of inclusive education”, students first studied a short infographic and video at home (flipped classroom, KISS). In class, a Kahoot quiz activated key terminology; a Wordwall “Match up” exercise consolidated the distinction between “inclusion”, “integration” and “segregation”; the Wheel of Names randomly selected teams to present solutions; and teams then worked on a clinical-pedagogical case – for example, planning a lesson for a child in an oncology ward with limited physical endurance – followed by role play of the lesson and group reflection.

Instruments. At the ascertaining stage all 354 students completed an author-designed questionnaire of 10 items (“Yes”, “No”, “Partly”) on the use of innovative methods, interactive digital tools, role play, PBL/TBL/CBL and on whether the course develops sufficient professional skills. After the intervention the experimental group evaluated the effectiveness of the methods used, and the control group described their current learning experience; two items were worded identically for both groups and were used for the between-group comparison.

Data analysis. Frequencies and percentages were calculated for each item. Differences between the experimental and control groups on identically worded items were tested with Pearson's χ^2 test ($df=1$), and effect size was estimated with Cramér's V, interpreted according to J. Cohen [19]. The significance level was set at $p<0.05$.

Results

Baseline. The ascertaining stage revealed a uniformly low level of innovative teaching in all three universities (Table 2). On average, only 24.0% of students reported regular use of innovative methods, 16.7% – systematic use of interactive digital tools, and 14.1% – systematic use of PBL, TBL and CBL. At Kimyo International University, where additional items were asked, the use of KISS (10.9%), LOIT (9.1%) and the flipped classroom (12.7%) was even lower. Only one third of students (33.1%) believed that the course develops sufficient professional skills.

Table 2 Baseline survey: share of “Yes” responses by university, %

Item	Nukus SPI (n=121)	Kokand SU (n=123)	KIUT (n=110)	Total (n=354)
Regular use of innovative methods	23.1	25.2	23.6	24.0
Systematic use of interactive digital tools	15.7	17.9	16.4	16.7
Gamified methods increase interest and knowledge	34.7	36.6	34.5	35.3
Use of interactive methods that activate students	30.6	32.5	30.9	31.4
Use of role play and simulation	18.2	20.3	19.1	19.2
Systematic use of PBL, TBL and CBL	13.2	15.4	13.6	14.1
The course develops sufficient professional skills	32.2	34.1	32.7	33.1

Source: authors' survey; totals calculated from frequencies.

Experimental group after the intervention. After three months, students in the experimental group evaluated the innovative methods very positively (Table 3). Overall, 89.3% stated that the innovative methods were more effective than traditional ones, 91.6% that gamified methods significantly increased their interest and knowledge, and 84.3% that the innovative approach sufficiently developed the skills needed for their future profession. The results were highly consistent across the three universities, with differences not exceeding 3 percentage points on any item.

Table 3 Experimental group: share of “Yes” responses after the intervention, %

Item	Nukus SPI (n=61)	Kokand SU (n=62)	KIUT (n=55)	Total (n=178)
Innovative methods were more effective than traditional ones	88.5	90.3	89.1	89.3
Kahoot, Wordwall, Wheel of Names helped consolidate knowledge	85.2	87.1	85.5	86.0
Gamified methods significantly increased interest and knowledge	91.8	91.9	90.9	91.6
Interactive methods increased activity in class	86.9	88.7	87.3	87.6
Role play and simulation helped to feel the inclusive environment	82.0	83.9	81.8	82.6
PBL, TBL, CBL improved the application of theory to practice	80.3	82.3	80.0	80.9
KISS technology helped develop knowledge and skills	77.0	79.0	76.4	77.5
LOIT and flipped classroom helped develop knowledge and skills	78.7	80.6	78.2	79.2
The approach sufficiently formed professional skills	83.6	85.5	83.6	84.3
I would prefer innovative methods in other courses	90.2	91.9	90.9	91.0

Source: authors' survey; totals calculated from frequencies.

Ranking the components by the share of positive evaluations shows that students valued most highly the gamified methods (91.6%), the overall effectiveness of the innovative approach (89.3%), interactive methods that increased classroom activity (87.6%) and digital consolidation tools (86.0%). Practice-oriented methods – role play and simulation (82.6%) and PBL/TBL/CBL (80.9%) – were also rated highly. The lowest, though still high, ratings were given to the KISS technology (77.5%) and to LOIT and the flipped classroom (79.2%), which require more independent preparation from students before class.

Comparison with the control group. Two items were worded identically for both groups (Table 4, Figure 1). The share of students who believed that gamified methods increase interest and knowledge was 91.6% in the experimental group and 34.1% in the control group ($\chi^2=125.4$, $p<0.001$); the share willing to use innovative methods in other courses was 91.0% and 32.4%, respectively ($\chi^2=128.9$, $p<0.001$). In both cases Cramér's V was 0.60, which corresponds to a large effect. Notably, the control group's post-test result on the first item (34.1%) was almost identical to the baseline level for all students (35.3%), whereas the experimental group's result was 2.6 times higher.

Table 4 Comparison of experimental and control groups on identically worded items

Item	Experimental (n=178)	Control (n=176)	χ^2 (df=1)	p	Cramér's V
Gamified methods increase interest and knowledge	163 (91.6%)	60 (34.1%)	125.4	<0.001	0.60
Willingness to use innovative methods in other courses	162 (91.0%)	57 (32.4%)	128.9	<0.001	0.60

Source: calculated by the authors.

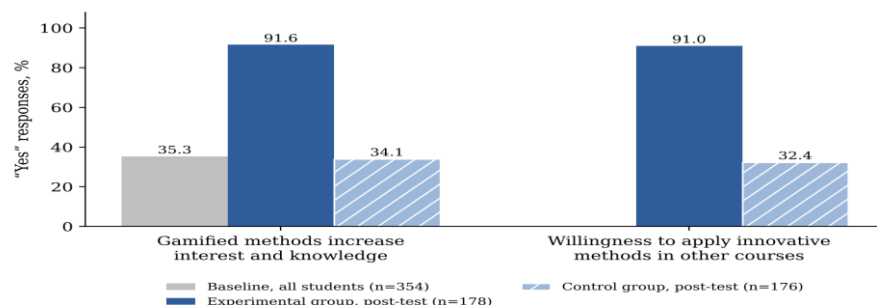


Figure 1. Students' evaluations at baseline and after the intervention, % of "Yes" responses

Source: authors' survey.

Discussion

The baseline data confirm that the teaching of hospital pedagogy in the universities studied remains predominantly traditional: active and digital methods are used only occasionally, and two thirds of students doubt that the course prepares them adequately for professional practice. This picture is consistent with international observations that teachers are rarely prepared specifically for hospital settings [9] and underlines the need to modernise the course.

The very positive evaluations in the experimental group, and the large difference from the control group on identically worded items, are in line with meta-analytic evidence on active learning [13] and gamification [16], and with studies of PBL and CBL [10; 12]. The consistency of results across three universities in different regions suggests that the model is transferable. The finding that the control group's attitudes remained at baseline level while those of the experimental group rose sharply indicates that positive attitudes to innovative

methods are formed through direct experience of them rather than by information alone – an important point for teacher education, in which future specialists tend to reproduce the methods by which they themselves were taught [6; 7].

The slightly lower ratings of the flipped classroom and LOIT are understandable: these technologies shift part of the work to independent preparation outside the classroom, to which students accustomed to lectures need time to adapt. This is consistent with reviews of flipped learning, which note an initial period of student resistance [14]. In practice, the share of pre-class work should therefore be increased gradually, and short KISS-format materials (infographics, two- to five-minute videos) should be used to reduce cognitive load [18]. For hospital pedagogy this also has a direct professional meaning: future teachers who have learned to compress material into short, clear units will be better able to teach children whose capacity for sustained work is limited by illness and treatment.

The study has limitations that should be considered when interpreting the results. First, groups were not randomly assigned; although the experimental groups had lower prior performance, which works against the hypothesis, other differences between groups cannot be excluded. Second, the outcomes are based on students' self-reports rather than on objective tests of knowledge and skills. Third, apart from two items, the post-intervention questionnaires for the two groups differed in wording, so most indicators describe the experimental group alone. Future research should use randomised or matched groups, objective achievement tests and observation of students' performance in hospital-school practice.

Conclusion

The study showed that the traditional teaching of the course “Inclusive Education. Hospital Pedagogy” does not sufficiently prepare future special educators for work with children undergoing long-term treatment. The proposed four-component model, which integrates KISS, LOIT and flipped-classroom technologies, PBL, TBL and CBL, role play, simulation and gamified digital tools, was evaluated very positively by students in three universities: 89.3% considered it more effective than traditional teaching, and on identically worded items the experimental group significantly outperformed the control group with a large effect size (Cramér's $V=0.60$).

It is recommended that higher education institutions training special educators include the model in the syllabus of the course, develop collections of clinical-pedagogical cases jointly with “Mehrli maktab” branches and paediatric clinics, organise practical training in hospital schools, and provide professional development for lecturers in active and digital teaching methods.

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