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DATA-DRIVEN POLICYMAKING IN INCLUSIVE EDUCATION: INTERNATIONAL EXPERIENCE – LESSONS FOR UKRAINE

This article provides an exploration of the critical role of data-driven policymaking (DDP) in advancing inclusive education on an international scale, with a specific focus on deriving actionable lessons for Ukraine amidst the ongoing war. It defines DDP as a fundamental shift from reliance on anecdotal evidence to a systematic approach of using empirical data to shape public decisions, thereby enhancing policy effectiveness, transparency, and continuous improvement. The paper systematically reviews the theoretical underpinnings and practical applications of DDP by analyzing international experiences and best practices from countries like Finland and Canada.

The analysis delves into the frameworks that make these systems successful, such as Finland's flexible three-tiered student support system and Canada's legal and policy frameworks that guarantee the right to education, despite challenges in implementation. The article then assesses the current state and unique challenges of inclusive education in Ukraine, which was undergoing significant modernization through the "New Ukrainian School" reform before the invasion. It highlights the devastating and widespread impact of the war, which has led to catastrophic damage to educational institutions, the mass displacement of millions of learners, and significant learning losses, with children with disabilities facing disproportionate difficulties.

Based on this comprehensive analysis, the article concludes by formulating actionable, evidence-based recommendations tailored specifically to Ukraine's socio-political context and the imperatives of post-war reconstruction. These recommendations aim to guide the creation of a more resilient, equitable, and inherently inclusive educational system by leveraging the lessons learned from international best practices in data-driven decision-making.

Ключові слова: data-driven policymaking, inclusive education, post-war reconstruction, vulnerable population, educational disparities, teacher training, digital tools, multi-tiered system of support, individualized education plans, data quality, collaboration, accessibility, learning losses.

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ПОЛІТИКА, ЩО ҐРУНТУЄТЬСЯ НА ДАНИХ, В СФЕРІ ІНКЛЮЗИВНОЇ ОСВІТИ: СВІТОВІ ПРАКТИКИ ТА РЕКОМЕНДАЦІЇ ДЛЯ УКРАЇНИ

Стаття присвячена дослідженню ролі політики, що ґрунтується на даних (data-driven policymaking), у просуванні інклюзивної освіти в міжнародному масштабі, з особливим акцентом на формулюванні дієвих уроків для України в умовах триваючої війни. Автори визначають політику, що ґрунтується на даних, як фундаментальний перехід від опори на неофіційні свідчення до систематичного підходу використання емпіричних даних для формування державних рішень, тим самим підвищуючи ефективність та прозорість державної політики в сфері інклюзивної освіти. У статті систематично розглядаються теоретичні основи та практичне застосування політики, що ґрунтується на даних, шляхом аналізу міжнародного досвіду та найкращих практик, зокрема таких країн, як Фінляндія та Канада. Аналізуються рамкові основи, що роблять ці системи успішними, такі як гнучка система підтримки у Фінляндії та політико-правові рамки Канади. Також в статті оцінюється поточний стан та виклики реалізації державної політики в сфері інклюзивної освіти в Україні. Автори наголошують на руйнівному впливі війни, що призвела до катастрофічних пошкоджень освітніх закладів, масового переміщення мільйонів тих хто навчається та навчає, значних освітніх втрат, причому особи з особливими освітніми потребами стикаються з непропорційно більшими труднощами в даних умовах.

На основі комплексного аналізу, автори формулюють дієві, обгрунтовані на даних рекомендації, розроблені для соціально-політичного контексту України та нагальних потреб повоєнної відбудови. Ці рекомендації мають на меті спрямувати створення більш стійкої, справедливої та по-справжньому інклюзивної освітньої системи шляхом використання уроків, отриманих з найкращих міжнародних практик ухвалення рішень на основі даних.

Keywords: прийняття рішень на основі даних, інклюзивна освіта, післявоєнна відбудова, вразливі групи населення, освітні диспропорції, підготовка педагогів, цифрові інструменти, багаторівнева система підтримки, індивідуальні плани навчання, якість даних, співпраця, доступність, освітні втрати.

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General problem statement and its relevance to significant scientific and practical challenges. Data-driven policymaking (DDP) is a fundamental approach to governance that involves the systematic collection, rigorous analysis, and informed interpretation of data to shape public decisions [9], [10]. This approach marks a significant departure from reliance on anecdotal evidence, intuition, or purely political considerations, instead grounding decisions in empirical evidence [9]. Its importance lies in its capacity to enhance policy effectiveness by identifying and addressing the root causes of problems, improving transparency and accountability in governance, and fostering a culture of experimentation and continuous improvement within public administration [9]. The evolution of DDP has been significantly accelerated by the advent of big data and advanced analytical methods, providing policymakers with access to unprecedented volumes of information [9].

Inclusive education is defined as an education system designed to embrace and support all learners, ensuring their acceptance and providing necessary resources for learning, regardless of their diverse abilities, backgrounds, or needs [44]. This comprehensive approach requires that teaching methods, curriculum design, school buildings, classrooms, play areas, transportation, and sanitation facilities are universally appropriate and accessible for every child at all levels of education [44]. Essentially, inclusive education means that all children learn together in mainstream schools, and no one should be excluded. This principle is underpinned by the UN Convention on the Rights of Persons with Disabilities (CRPD), which explicitly recognizes the right to inclusive education for all persons with disabilities [44]. The intersection of DDP and inclusive education is crucial. It enables policymakers to precisely identify educational disparities, tailor interventions to specific needs, and rigorously measure the impact of policies aimed at ensuring equitable access and high-quality learning for all students.

Inclusive education is a universally recognized global priority, formally enshrined in Sustainable Development Goal 4 (SDG 4), which directly calls for "inclusive and equitable quality education and lifelong learning opportunities for all" [39]. Despite this strong international commitment and progress in some areas, a significant challenge persists: many of the most marginalized learners, particularly in low- and middle-income countries, remain left behind. Data indicates that over 40% of students who enroll in primary education do not progress to upper secondary school by the expected age. A critical factor contributing to this gap is that many countries still do not systematically collect, report, or utilize disaggregated data on these left-behind populations [17].

The implementation of inclusive education worldwide faces numerous practical challenges. These include deeply ingrained attitudinal barriers and societal prejudices, rigid curricula that fail to accommodate diverse learning styles, inadequate teacher training and professional development, insufficient financial and material resources, persistent social stigma and bullying, a lack of physically accessible infrastructure, limited community engagement, and inconsistent policy implementation [38]. These systemic challenges underscore the urgent need for evidence-based approaches to accurately diagnose root causes and implement effective, sustainable solutions.

For Ukraine, the relevance and imperative of implementing DDP in inclusive education are significantly heightened by the ongoing full-scale Russian invasion, which commenced on February 24, 2022 [36]. This conflict has inflicted immeasurable catastrophic consequences, profoundly disrupting daily life and, critically, the entire education system [36]. The war has led to widespread damage and destruction of educational facilities, mass displacement of students and teachers, and significant, measurable learning losses across the country [30]. Children with disabilities, in particular, face disproportionate difficulties in accessing education and safe learning environments amidst the hostilities [7]. In this highly volatile and complex environment, DDP offers a crucial, adaptive pathway to guide the reconstruction of a more resilient, equitable, and inherently inclusive educational system during the recovery and reconstruction phases.

DDP acts as a catalyst for systemic transformation in inclusive education. It signifies a shift

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from anecdotal decision-making to leveraging empirical evidence to shape policy. Inclusive education, in turn, demands the transformation of the entire education system—its legislation, financing, administration, design, service delivery, and monitoring. Global challenges such as attitudinal barriers, inadequate teacher training, and insufficient resources are not merely superficial issues but deeply entrenched systemic deficiencies. The core tenets of DDP—enhancing effectiveness, bolstering transparency and accountability, and fostering continuous improvement—directly address these systemic shortcomings [9]. Thus, DDP is not merely a tool for making better individual decisions; it is a fundamental, transformative approach that compels educational systems to systematically identify, address, and monitor the complex, interconnected barriers to inclusion. This implies that without robust, disaggregated data and the capacity to analyze it, inclusive education efforts may remain fragmented, misdirected, or tokenistic rather than leading to substantive, equitable change.

There is also heightened vulnerability exacerbated by data gaps. Many of the most marginalized learners remain left behind, and their disadvantages can be compounded by intersecting variables such as gender, poverty, and disability. Crucially, many countries still do not collect, report, or use data on those left behind [17]. This creates a critical cycle of exclusion: if data on specific, intersecting marginalized groups (e.g., children with disabilities who are also internally displaced due to conflict) are not systematically collected or disaggregated, their unique and compounded challenges remain invisible to policymakers. This invisibility hinders the design and implementation of targeted, effective interventions. "Compounded difficulties" are not merely additive; they create a qualitatively different experience of exclusion that cannot be fully understood or addressed without granular, intersectional data. This means that current data collection practices, failing to capture the nuanced realities of exclusion, inadvertently perpetuate and deepen educational inequity, making "those left behind" even harder to reach.

The war in Ukraine presents an unprecedented test and opportunity for DDP in inclusive education. The widespread destruction [30], pervasive displacement [11], significant learning losses [23], and disproportionate impact on children with disabilities [7] create not merely a static challenge but a dynamic, rapidly evolving humanitarian and educational crisis. Traditional, rigid policymaking, typically predicated on stable conditions, would be inherently inadequate. DDP, with its emphasis on "continuous improvement" and "experimentation" [9], becomes not just useful but absolutely essential for real-time adaptation, effective resource allocation, and continuous monitoring of intervention effectiveness in such an extraordinarily volatile and unpredictable environment. The scale and complexity of the disruption demand a flexible, adaptive, and data-informed approach to prevent further marginalization and ensure that all reconstruction and recovery efforts are inherently inclusive. This implies that Ukraine's devastating crisis, while tragic, may paradoxically accelerate the adoption and refinement of DDP for inclusive education, driven by the necessity of effective crisis response and recovery.

Review of recent studies and publications that have addressed this problem and form the basis of the author's work. Contemporary academic discourse highlights an evolving understanding of inclusion, moving beyond mere physical integration of students with disabilities to a holistic approach that actively adapts educational systems to diverse needs and ensures active participation [32]. A significant trend is the increasing recognition of technology, particularly digital tools and specialized devices, for their transformative role in facilitating equitable access to learning and enabling personalized educational experiences in inclusive settings [21], [43]. Furthermore, advanced analytical methods, including Artificial Intelligence (AI) and machine learning, are extensively explored for their potential in policy analysis, identifying complex patterns, predicting outcomes, and evaluating the impact of inclusive education policies [2], [9]. Research consistently underscores the paramount importance of comprehensive teacher training and robust institutional support as critical enablers for successful inclusive practices [21], [27]. Studies also increasingly point to the imperative of more inclusive and participatory research methodologies that integrate

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intersectional factors such as gender, socioeconomic status, and geographical location to design technological solutions and policy interventions that truly address the diverse needs of all students with disabilities [21].

Formulation of the article's objectives (defining the tasks). The aim of this paper is to investigate the crucial role of data-driven policymaking (DDP) in promoting inclusive education globally by systematically reviewing its theoretical foundations and practical uses; to examine international best practices and case studies, specifically focusing on the approaches taken in Finland and Canada; to evaluate the present condition and distinct challenges of inclusive education in Ukraine, paying special attention to the severe consequences of the war on educational infrastructure, student access, and equity for vulnerable groups; to develop practical, evidence-based policy recommendations specifically for Ukraine's unique socio-political situation and its post-war reconstruction needs, with the goal of creating a more durable and inclusive education system.

Presentation of the main material of the research with a full substantiation of the obtained scientific results. Effective data-driven policymaking is predicated on several critical principles. Foremost is data quality, which demands that data be accurate, complete, and relevant to the specific policy problem being addressed. Poor quality data can inevitably lead to inaccurate insights and misguided policy decisions [9]. Therefore, ensuring the accuracy, completeness, and consistency of data over time is paramount [9]. A second principle is robust data analysis, which involves employing sophisticated statistical and analytical methods, including advanced statistical modeling and machine learning, to derive meaningful insights, identify patterns, trends, and correlations, predict outcomes, and evaluate the impact of policies [9]. Collaboration is another essential principle, requiring seamless interaction among policymakers, data analysts, educators, and other stakeholders to ensure that data is effectively utilized and insights are translated into actionable policy recommendations [4]. Finally, transparency is crucial for building trust in data-driven decision-making processes, necessitating openness about the data sources used, methodologies applied, and conclusions drawn [4]. Key principles of data-driven policymaking are shown in Fig. 1.
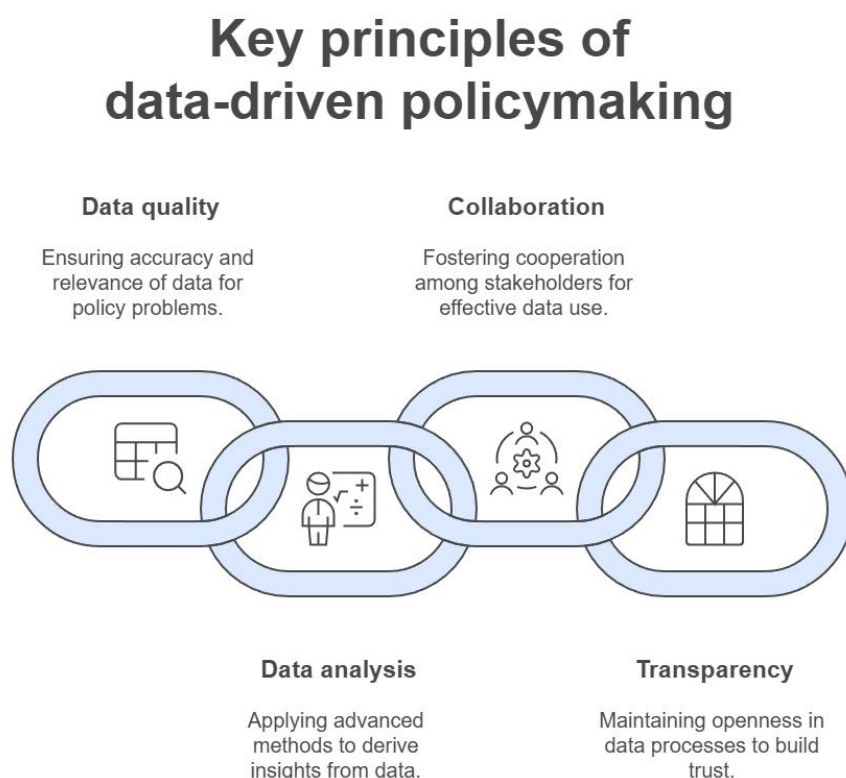
Key principles of data-driven policymaking

Data quality
Ensuring accuracy and relevance of data for policy problems.

Collaboration
Fostering cooperation among stakeholders for effective data use.

Data analysis
Applying advanced methods to derive insights from data.

Transparency
Maintaining openness in data processes to build trust.

Figure1. Key principles of data-driven policymaking

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Source: created by authors based on [2], [4].

Data quality – ensuring accuracy, completeness, and relevance of data for specific policy problems. This includes verifying data accuracy, ensuring comprehensiveness across all relevant variables, and maintaining consistency in data collection and analysis over time [2].

Data analysis – applying statistical and analytical methods, including advanced statistical modeling and machine learning, to derive meaningful insights from data. This involves identifying patterns, trends, and correlations, predicting outcomes, and evaluating the impact of policies [2].

Collaboration – fostering effective cooperation and coordination among various stakeholders, including policymakers, data analysts, educators, and other relevant partners. This ensures that data is effectively utilized and insights are accurately translated into actionable policy recommendations [4].

Transparency – maintaining openness and clarity regarding the data sources used, the analytical methodologies applied, and the conclusions drawn. This is essential for building trust in data-driven decision-making processes among all stakeholders and the public [4].

A number of international instruments and initiatives lay the groundwork for inclusive education:

The UNESCO Salamanca Statement (1994). This foundational document is considered a cornerstone of inclusive policy, advocating for child-centered pedagogy. It called for schools to accommodate all children, regardless of their physical, intellectual, social, emotional, linguistic, or other conditions, emphasizing the need for adapted teaching methods, curricula, and learning environments. It also stressed the importance of adequate teacher training and support, as well as collaboration among governments, non-governmental organizations, communities, and families [39].

The UN Convention on the Rights of Persons with Disabilities (CRPD, 2006). Article 24 of the CRPD specifically addresses the right to inclusive education and obliges State Parties to ensure that children with disabilities are not excluded from general education systems and to actively remove barriers to their full participation [44].

Sustainable Development Goal 4 (SDG 4, 2015). Central to the UN's 2030 Agenda, SDG 4 places the goal of "inclusive and equitable quality education and lifelong learning opportunities for all" at its core. It calls on governments to step up efforts to achieve inclusion in education, with a particular emphasis on the vital role of civil society and the active involvement of marginalized groups [39].

Education for All (EFA) Initiatives. These global initiatives have significantly contributed to the adoption and implementation of inclusive education principles, especially in low- and middle-income countries [39].

The evolution of inclusive education frameworks, from the initial call of the Salamanca Statement for accommodation to the CRPD's legal mandate for non-discrimination and barrier removal, and then to SDG 4's emphasis on equitable quality education for all, demonstrates a clear progression. This progression indicates a shift from merely "including" students (often interpreted as physical placement) to actively "valuing differences," ensuring "active participation," and fostering "respect for diversity" [39]. This implies that policy frameworks are moving beyond mere legal compliance or administrative adjustments to fostering a deeply embedded inclusive culture within educational systems. Consequently, data collection must reflect this deepened understanding, moving from simple enrollment figures to more nuanced metrics that capture the quality of inclusion, such as student engagement, sense of belonging, quality of social interactions, and the effectiveness of differentiated instruction and individualized support [14]. This suggests that true inclusion requires a fundamental cultural paradigm shift, not just legislative changes, and that this shift can and should be systematically measured through both quantitative and qualitative data on attitudes, behaviors, and lived experiences within the educational environment.

Beyond these international mandates, effective national inclusive education policy frameworks are characterized by a clear commitment to equity and non-discrimination, explicit definitions and expectations for inclusion, structured support and accommodation measures, adequate

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resource allocation and specialized teacher training, and robust mechanisms for monitoring, evaluation, and data-driven improvement [14].

Data-driven policymaking involves a dynamic, iterative feedback loop that is a prerequisite for adaptive inclusive systems. It plays a pivotal role in fostering a culture of experimentation and continuous improvement, as well as in using data to evaluate policy effectiveness and make necessary adjustments [9]. This description implies a dynamic, iterative feedback loop where data is not merely collected for reporting but actively used to refine policies and practices in real-time. In the context of inclusive education, where diverse student needs are constantly evolving and interventions often require individualized approaches, this adaptive capacity is absolutely crucial. Without such a robust feedback loop, policies risk becoming static, outdated, and ultimately ineffective in addressing the complex and changing realities of an inclusive learning environment. This underscores that DDP is not a one-time assessment or a linear process, but a continuous, cyclical, and iterative approach that is essential for building responsive, resilient, and effective inclusive education systems.

Finland is globally recognized as one of the most equitable and high-performing education systems, consistently demonstrating strong results in international assessments like PISA while maintaining a very low number of low-achieving students [33]. Inclusion and equal rights to education have been core guiding principles of Finnish educational policy since 1917 [28]. Finnish education law mandates that all students have access to high-quality education in mainstream schools, regardless of their learning difficulties, special needs, or socioeconomic background [38]. The system is built on the belief that no child should be left behind, ensuring equal access and opportunities for all citizens, irrespective of ethnic origin, age, wealth, or place of residence [13]. This commitment to equality ensures full integration into mainstream classrooms rather than separate institutions [38].

Finland employs a flexible three-tiered support system designed to prevent problems from emerging and escalating. General support is the first response to problems, provided as part of everyday school activities without specific assessment or decisions. If general support is insufficient, teachers (with expert help if needed) prepare a written pedagogical evaluation, leading to a learning plan in collaboration with the student and parents. This is intensified support, which is more robust, regular, and individualized. Special support is provided for students who cannot achieve learning objectives through other measures. This requires an official decision based on information from teachers and the school's student welfare body, leading to an Individualized Education Plan (IEP) [26], [38]. IEPs outline specific goals, strategies, and support mechanisms tailored to the student's needs and are regularly reviewed and adjusted [15]. The ideology is to integrate students into the mainstream system whenever possible, with support provided at their own school through flexible arrangements [38].

A cornerstone of Finland's success is its highly qualified teaching force. All Finnish teachers are required to hold a Master's degree, and teacher training programs emphasize research, where teaching is research-informed and integrated with it [13]. Continuous professional development ensures that teachers are well-equipped to effectively integrate technology into their teaching, enhancing the learning experience for all students [35]. Collaboration among students, teachers, and parents is deeply embedded in the Finnish education system, fostering a supportive and inclusive community [15].

Finland effectively leverages digital learning tools and practices, from online platforms to AI-driven solutions, to personalize, engage, and make education accessible, particularly in sparsely populated regions where it helps overcome geographical barriers and offers a wider range of elective studies. National guidelines are being prepared by the Finnish National Agency for Education to support the ethical and effective use of AI in teaching and learning [35]. Research indicates that students educated in Finland's inclusive settings demonstrate better academic outcomes, are more engaged, and develop better social skills compared to peers in segregated settings. The Finnish education system's focus on holistic development ensures that students are academically successful and well-rounded individuals, equipped with critical thinking and socio-emotional skills [15].

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Canada and each of its provincial legislatures ratified the CRPD in 2010, thereby committing to equal access to opportunities and services for persons with disabilities. Provincial and territorial education acts guarantee access to public education for children regardless of their abilities, and human rights laws further protect against discrimination, ensuring every child's right to an education that meets their needs. A 2012 Supreme Court ruling (Moore v. British Columbia) affirmed that adequate support for individual students is an essential service, not a "dispensable luxury," obligating schools to remove barriers unless doing so causes "undue hardship" [25]. The principle of inclusion means that all students are entitled to equitable access to learning and achievement [14].

Despite strong legal and policy frameworks, the implementation of inclusive education varies significantly across provinces, within school jurisdictions, and even among individual schools [5]. Systemic barriers continue to exclude children with diverse learning needs, including intellectual disabilities, from full participation in school life. Data indicates that fewer than 50% of children with intellectual disabilities are placed in fully inclusive classrooms, and 30% must leave their local or community schools to access education. High suspension rates for students with disabilities (2.5 times higher than peers) and a lack of accommodations in extracurricular activities further limit their access to learning opportunities. Alarmingly, a survey of elementary and secondary principals in Ontario revealed that 40% to 50% had, at some point, asked parents to keep their children with disabilities at home [25].

Regarding data collection and utilization, Canadian provinces demonstrate varied approaches. British Columbia emphasizes systematic observation and collection of behavioral data to establish baselines and track progress, as well as synthesizing information from parents, school records, other service providers, and health-related information to aid the assessment process. In-depth interviews with students are also conducted to determine their knowledge of the learning process and/or thinking strategies [20]. In Nova Scotia, the Inclusive Education Policy (effective September 2020) aims to ensure high-quality, culturally and linguistically responsive, and equitable education. Schools are required to establish Student Planning Teams, involving students and parents, to support identified learning strengths and challenges and overall well-being. A Multi-Tiered System of Supports (MTSS) framework is foundational for supporting student well-being and achievement [19]. In Ontario, Individual Education Plans (IEPs) include components such as the student's full name, date of birth, student identification number, current school year, school and principal names, date of the most recent Identification, Placement, and Review Committee (IPRC) meeting, the student's exceptionality, IPRC placement decision, current grade and/or special education class placement, type of diploma or certificate, subjects or courses to which the IEP applies, and relevant medical conditions [8].

Canada-wide data from 2001 showed that approximately 4% of Canadian children aged 5 to 14 had some form of activity limitation. About one-third of all parents of children with disabilities reported experiencing difficulty accessing special education services. Provincial differences in the placement of students with disabilities in regular classes were significant, with the highest proportions in Prince Edward Island (73%), New Brunswick (72%), and Nova Scotia (67%), and the lowest in Quebec (48%) and British Columbia (51%). In 2000, 74% of all parents believed their child was being challenged to meet their potential, though this proportion was lower for children with physical (70%) and cognitive/emotional (64%) disabilities [6].

Global challenges in inclusive education remain significant and multifaceted. These include deeply ingrained attitudinal barriers and societal prejudices, rigid curricula that fail to accommodate diverse learning styles, inadequate teacher training and professional development, insufficient financial and material resources, persistent social stigma and bullying, a lack of physically accessible infrastructure, limited community engagement, and inconsistent policy implementation [38]. Furthermore, data fragmentation and inconsistency, particularly concerning marginalized learners, hinder a comprehensive understanding of needs and progress [17]. Limited analytical capacity, encompassing a lack of infrastructure and skilled personnel, also poses a significant impediment [4], [37]. Methodological flaws in research, such as selection bias and the failure to

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adequately account for prior performance or disability severity, undermine the evidence base for certain inclusive practices [40]. Ethical considerations related to the use of AI in education, including potential biases and privacy concerns, also demand careful consideration [39].

Despite these challenges, significant opportunities exist to advance inclusive education through data. Technological advancements, such as digital tools and AI, offer powerful means to enhance accessibility and personalize learning [21]. An evolving understanding of inclusion, moving beyond mere integration to a holistic approach that values diversity and ensures active participation, provides a foundation for more effective policies [32]. The growing recognition among stakeholders of the value of inclusive education, fostering diversity, equity, and social cohesion, creates a conducive environment for change [16]. An emphasis on intersectional needs, accounting for the complex interplay of factors like gender, poverty, and disability, enables the design of more targeted and effective interventions [17]. Investing in data quality, building analytical capacity, promoting data sharing across government agencies and with external partners, and addressing ethical concerns related to data use are key strategies for overcoming existing limitations. Additionally, collaboration among policymakers, data analysts, educators, and other stakeholders is vital for translating data into actionable policy decisions [4].

Prior to the full-scale invasion, Ukraine was already actively working to modernize its education system. The "New Ukrainian School" (NUS) reform, launched in 2017, aimed to modernize general secondary education (grades 1-12) and align it with EU standards [42]. This reform emphasized a curriculum focused on 21st-century skills, continuous professional development for teachers, modernized education management, and child-centered learning, with an emphasis on inclusion [23], [42]. From 2018 to 2024, the Ukrainian government allocated UAH 6.32 billion for its implementation, and by the 2023-2024 academic year, the reform covered over 2.2 million primary and basic secondary school students [16]. While inclusive education was formally recognized in Ukrainian legislation, implementation remained inconsistent, with barriers including limited accessibility infrastructure, a lack of systematic teacher training, and insufficient financial support [18].

The full-scale Russian invasion on February 24, 2022, fundamentally altered Ukraine's educational landscape [36].

Over 3,400 educational institutions have been damaged, and more than 400 completely destroyed [30]. The total cost of damage to educational infrastructure is estimated at $13.4 billion. Other reports indicate nearly 4,000 damaged schools, with 365 completely destroyed, and 1,306 damaged and 294 completely destroyed facilities according to UN data [23].

The war has led to the displacement of 6.4 million school-aged learners [30], with over 6.3 million refugees remaining displaced across Europe [11]. More than 3 million children have been forced from their homes [37]. As of December 2024, 741,000 children were studying in a hybrid format (in-person/remote) due to schools lacking bomb shelters, and another 443,000 were learning entirely online in active hostilities zones [23]. Children with disabilities, in particular, have faced disproportionate difficulties in evacuation, accessing shelters, and disruption of critical services [7].

The war has resulted in significant learning losses. According to PISA 2022, Ukrainian students lag behind their OECD peers by approximately one and a half years in math and science and nearly two and a half years in reading [23]. Technical difficulties, including power outages and limited internet access, further hinder online learning. The mental health consequences are immense, with millions of children experiencing high levels of trauma, anxiety, and depression, as well as difficulties with concentration and emotional processing. These psychological challenges often go unaddressed due to limited resources and support services [37]. The impact on children with disabilities is particularly severe, as they face additional barriers to accessing education and socialization [7].

Many professionals with relevant knowledge and experience working with children with special educational needs have left the country or moved to other regions, leading to a shortage of

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necessary professional assistance [7].

Enormous resources are being used to defend the country, restore critical infrastructure, and maintain the economy, which reduces the state's ability to support children with special educational needs [7].

Despite the challenges of the war, the Ukrainian government and international partners continue efforts to support education. The "Lifting Education Access and Resilience in Times of Need" (LEARN) program, supported by the World Bank, aims to address the immediate impact of the war—improving school safety conditions, providing free transportation for vulnerable students, training teachers, and purchasing textbooks [23]. UNESCO has distributed over 50,000 devices to teachers across Ukraine and more than 8,500 devices to Ukrainian children unable to attend in-person education due to the war [30].

Important policy initiatives are also being implemented. In December 2024, UNICEF, in collaboration with the Presidential Commissioner for Children's Rights and Child Rehabilitation, launched the "First National Lesson on Inclusion" campaign to promote inclusive mindsets and learning among 160,000 children with disabilities in Ukraine [24]. This initiative is part of the "Children as Children" communication campaign, aimed at increasing the visibility of children with disabilities and destigmatizing disability [24]. The "Better Care Reform" also aims to transition from institutional to family-based care for the most vulnerable children, including those with disabilities, with the goal of strengthening the education system to accommodate them in mainstream schools [24]. Positively, recent data indicates that approximately 75% of Ukrainians have a positive attitude towards children with disabilities learning in the same class [24]. However, significant challenges persist in Ukraine's higher education, including insufficient infrastructure adaptation, a lack of systematic staff training on inclusive practices, limited financial resources, the persistence of exclusionary attitudes within academia, bureaucratic inertia, and fragmented policy enforcement [1].

International experience in data-driven policymaking in inclusive education offers valuable lessons for Ukraine, particularly in its pursuit of post-war recovery and the construction of a more resilient and inclusive educational system.

Strategic investment in data infrastructure and analytical capacity. Finland's success in inclusive education largely hinges on its ability to provide individualized support, which necessitates granular data for developing and revising Individualized Education Plans (IEPs) [33]. Similarly, Canadian provinces like British Columbia systematically collect behavioral data and synthesize information for student needs assessment [20]. For Ukraine, this implies the need to overcome data fragmentation and invest in comprehensive Education Management Information Systems (EMIS), especially for higher education where data remains disparate [4]. Developing skilled analysts capable of interpreting complex statistical patterns and translating them into policy recommendations is critically important [4]. This will be crucial for identifying and addressing the diverse needs of students who have been displaced or affected by the conflict, ensuring that reconstruction efforts are grounded in evidence of real needs.

Prioritizing teacher professional development in inclusive pedagogy. The Finnish model underscores the importance of highly qualified teachers who hold Master's degrees and undergo research-based training and continuous professional development [13]. This equips them to effectively integrate technology and adapt teaching methods to diverse student needs [35]. For Ukraine, facing "inadequate teacher training" [38], investing in comprehensive professional development programs is paramount. These programs should focus on culturally and linguistically responsive pedagogy, trauma-informed approaches, and the use of assistive technologies to support all learners [14].

Implementing a multi-tiered system of supports (MTSS). Finland employs a three-tiered support system (general, intensified, and special support) for early identification and prevention of problems [38]. Similarly, Nova Scotia in Canada utilizes an MTSS framework to ensure effective instruction and support for all students [19]. Implementing such a systematic, flexible system in

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Ukraine is vital. This will enable timely and adapted support for students experiencing war-related trauma and significant learning losses, ensuring no child is left behind.

Leveraging technology for accessibility and personalized learning. Finland demonstrates how digital learning tools and AI can be utilized to personalize learning, overcome geographical barriers, and expand educational opportunities [35]. In Ukraine's context, where technical difficulties such as power outages and limited internet access hinder learning [37], investing in digital learning centers and devices, and developing national guidelines for AI use in education, are critically important [35]. AI can be leveraged to develop IEPs, modify curricula, and create adaptive learning materials, providing individualized support for students with disabilities [39].

Fostering strong partnerships and community engagement. In both Finland and Canada, collaboration among students, teachers, parents, and the community is a cornerstone of inclusive systems [15]. Parental involvement is vital for ensuring holistic support [5]. For conflict-affected Ukraine, such partnerships are crucial for reintegrating displaced children, overcoming social stigma, and ensuring holistic support amidst post-conflict recovery [24]. Establishing School Improvement Committees composed of children, teachers, and caregivers can foster community engagement and improve the school environment.

Ensuring policy coherence and regulatory enforcement. While Canada has strong legal frameworks, variations in policy implementation exist across provinces [5]. For Ukraine, facing "inconsistent policies" and "fragmented policy enforcement" [18], translating legislative recognition of inclusion into consistent and effective implementation at all levels is crucial. This requires clear guidance, monitoring, and accountability mechanisms.

Addressing intersectional vulnerabilities with disaggregated data. Global data gaps indicate that many countries do not collect data on marginalized groups [17]. For Ukraine, this means prioritizing the collection of disaggregated data on displaced children, children with war-related disabilities, and those with compounded difficulties. This granular information is essential for designing targeted support programs and ensuring equitable resource allocation, guaranteeing that no child is left behind in the recovery process.

The conclusions drawn from this research and the potential for future investigations in this field. The analysis of international experience underscores the indispensable role of data-driven policymaking in advancing and sustaining inclusive education. Successful models, such as those in Finland and Canada, demonstrate that a systemic commitment to equity, underpinned by robust data collection, targeted support, highly qualified educators, and adaptive infrastructure, can lead to significant improvements in learning outcomes and social integration for all students. These countries illustrate that DDP is not merely an administrative tool but a fundamental approach that fosters continuous improvement and adaptation of educational systems to the evolving needs of a diverse student population.

For Ukraine, facing unprecedented challenges due to the ongoing conflict, the lessons from international experience are not merely theoretical but vital for practical application. The widespread infrastructure destruction [30], mass displacement [11], significant learning losses [23], and disproportionate impact on vulnerable populations [7] necessitate an immediate and strategic response. Implementing DDP in inclusive education in Ukraine is not just desirable but essential to ensure the effective allocation of limited resources, accurate identification of the most pressing needs, and monitoring the impact of interventions in a dynamic environment. This will enable Ukraine not only to rebuild but also to transform its education system into a more resilient, equitable, and inclusive one, aligned with international standards and principles.

Further research is crucial to deepen understanding and support Ukraine's efforts. Studies could focus on: the effectiveness of specific data-driven interventions, such as AI-powered support systems for IEP development or the use of digital learning platforms, within conflict and post-conflict settings; best practices for data collection and analysis in rapidly changing, high-stress environments to develop flexible and robust methodologies for gathering information amidst crisis; exploring sustainable funding models and resource allocation for inclusive education during reconstruction,

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considering economic constraints and the need for prioritizing needs.

These research avenues can provide the necessary evidence base to further shape policy and practice, contributing to an education system that truly serves every child in Ukraine, despite past and ongoing challenges.

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