

Benefits and Limitations of using Data-Driven Approach to Develop Inclusivity Networks for Young Disabled People: A case study of Assemble by the National Youth Theatre

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Abstract - Inclusivity networks bridge the gap between disabled and non-disabled communities, empowering individuals. Organisations like the National Youth Theatre has run its Local Inclusivity Networks programme to promote collaboration, reduce isolation, and empower young disabled voices. A data-driven approach is a powerful way to make informed decisions and solve complex problems based on empirical evidence and quantitative data. This paper explores the benefits and limitations of using data-driven approaches to support the development of local inclusivity networks to enhance young disabled people voices and lived experience into decision-making. and discuss the creation of a dynamic data dashboard, enhancing research efficiency by drawing on existing good practice examples from a London Local authority. By combining meaningful findings with data-driven recommendations, we contribute to building more inclusive networks for young disabled people. However, its limitations such as limited data sources, data quality must be addressed.

Keywords: Data Analytics, Data Visualisation, Data-driven, Data Dashboard
Inclusivity Network, Disability, Young People, Quantitative

1 Introduction

A data-driven approach is a powerful way to make informed decisions and solve complex problems based on empirical evidence and quantitative data. Data driven approaches to support decision-making have become the mantra in several high-performance sectors as well as in the work of governments nationally and internationally. They represent a key element of developing the evidence-base policy making paradigm, capitalising on new technological trends and innovations such as big data analytics or AI [1],[2]. On a European level this has been done, for example, by the Estonian government in collaboration with the European Commission, who have developed the Data Driven Decision Management (DDDM) that supports a more informed and efficient decision-making process, thus reducing the potential dangers of using incomplete or misinterpreted data [3].

One area where data-driven approaches could be utilised is for improving the lives of disabled people, particularly when it comes to this group participating in societal

activities, such as education and culture. According to the latest Family Resources Survey[4]16.0 million people in the UK were considered disabled in the 2021/22 financial year. This represents 24% of the UK population. Disability is a concern that increasingly affects all ages, and even many young people are disabled. As of 2023, 1.2 million individuals aged 10 to 24 are considered disabled, which is more than double the number reported a decade earlier [5]. These young disabled people face a series of barriers when it comes to fully participating in society: attitudinal, physical, policy, communication, social. Whilst ‘fully participating in society’ can indeed be difficult to define, it Across England and Wales, statistics show that young learning-disabled people have poor access to opportunities beyond school. It is therefore imperative to take actions to help them.

Aside from providing accurate statistics on the scale of disability across the young UK population, data driven approaches can help local decision makers as well as delivery organisations record, share and utilise data insights with regards to availability of support services, engagement with and feedback on these services.

In line with a collaborative governance logic that puts great emphasis on partnership and co-operation between different actors in a complex system of decision-making, we are witnessing an increase in network-based approaches to tackle wicked problems [6]. Enhancing young disabled people’s voice in decision making (whether it is around accessing educational and health services or accessing inclusive cultural and leisure activities provisions) could be considered one of those wicked problems.

Inclusivity networks focused on enhancing the co-operation between disabled and non-disabled communities can play a crucial role in supporting and empowering disabled individuals. Being embedded in social networks enables disabled people to benefit from social support which are essential to overcome challenges and access resources. Many organisations such as the National Youth Theatre (NYT) have run their version of Local Inclusivity Networks (LINs) initiatives to promote collaboration between disabled and non-disabled communities, reduce isolation, and establish grassroots inclusivity networks and made impressive progress.

However, to build stronger, more inclusive networks require addressing many challenges in creating safe spaces, fostering genuine connections, and actively promoting diversity especially for disabled people. Apart from physical barriers and policy and legislation gaps, information barriers, technological inclusion, and training and awareness also are challenges inclusivity networks face. To address these challenges requires collaboration between government, industry, and advocacy groups to create a more accessible and inclusive environment for disabled individuals.

The aim of this paper is two-fold. On the one hand, the paper explores the benefits and limitations of using data-driven approaches to support the development of local inclusivity networks focused enhancing young disabled people’s voices and lived experience into decision-making. We will be using a case study of National Lottery funded initiative by the NTY and the National Youth Arts Wales. The Assemble programme aims to build connections between disabled and non-disabled communities, instil confidence in disabled young people to access and engage in their local environments, and drive impactful, lasting social and policy changes at the local level, guided by their voices and experiences. On the other hand, we discuss the creation of a dynamic data dashboard, enhancing research efficiency by drawing on existing good practice examples from a London Local authority. By combining meaningful findings

with data-driven recommendations, we contribute to building more inclusive networks for young disabled people.

The paper is organised as follows: in Section 2 presents relevant works that utilise data-driven approaches to enhance their research, business performances, or government efficiency and policy making process; Section 3 describes the methodology used in the research; in Section 3.1 deals with the context of youth disabilities and the relevant data collection and preparation process are reported; in Section 3.2 we present details of data analysis and visualisation of current disabled young people. Section 4 discusses the findings and directions for further qualitative research. Section 5 contains the conclusions and further work.

2 Relevant work

A data-driven approach offers many advantages for organisations and decision-makers. Naturally, many businesses consider integrating data-driven approach for their decision-making to tackle business problems. Recently, researchers also take advantages of data-driven approach and use it to help address social problems and it shows the power of the approach.

Chen et al utilized social interaction data to address the community detection problem in Facebook and to find the multiple social groups of a Facebook user [7]. It helped social interactions in a social network. Yadav et al used data-driven models to predict quality of life dimensions of people with intellectual disability[8]. Lane used data-driven approach to conduct research for identifying and supporting students at risk for emotional and behavioural disorders [9]. Data-driven approach is proposed by Chen et al to enhance the accessible travelling for people with disabilities [7]

However, it also faces challenges such as data quality and reliability, data integration, and data privacy.

Moreover points out that the problem of data quality emerges because when data is unreliable, managers quickly discredit it and use their intuition to make decisions. [10] Waller et al found that ensuring decision making quality is correlated with factors like data quality of data sources, data analytics capabilities, staff and decision-maker quality[11]. Yu et al identified that data integration problem from the voluminous data generated from different sources in disparate formats and pointed out that the need for a reconciliation of data into a unique model, the identification of relationships, and the enabling of data analytics processes extremely vital [12].

In this research, we address the challenges associated with a data-driven approach. Our methodology involves utilizing data exclusively from reputable sources, including the Office for National Statistics (ONS), the NHS, and our research partners. By relying on these official channels, we aim to enhance data quality and reliability. To ensure consistency, we will perform data cleaning and integration before analysis. While individual-level data may provide richer insights, we prioritize compliance with data privacy regulations, specifically adhering to the General Data Protection Regulation (GDPR) guidelines. Our commitment to robust data practices will contribute to more accurate and meaningful results.

3 Methodology

A data-driven methodology is a systematic approach where decisions are informed by rigorous analysis of data, rather than relying solely on intuition or anecdotal evidence. In this research, we use 5-steps data-driven methodology below:

- Understanding the objectives - Use data to better support inclusivity networks for youth with disabilities
- Finding relevant data sources - collecting data about youth with disabilities
- Organising data - Organise data to improve data analysis and visualization in order for making effective decisions
- Performing data analysis and visualization - extract actionable insights from data to help inclusivity networks
- Discuss findings and draw conclusions – use the findings to draw conclusions and provide further directions of qualitative research

3.1 Data collection

The data has been collected from the diverse sources. The complete list of datasets have been provided in the Table 1. Different datasets have been selected for this study for obtaining holistic picture while solving the research question.

However, the availability of comprehensive data on disabled young people presents several challenges due to the existing national data sets related to disabled young people are often incomplete, containing gaps and missing values, anomalies, and inconsistencies. There is relatively little data available specifically on disabled young people with detailed granularity levels and a lack of coherence across different services.

To address this issue, we focus on data with age information and borough-level granularity. If the information is found to be critical to the study, the necessary estimates have been made using statistical methods. Data will be integrated for further analysis.

Table 1. Information about Datasets and their sources.

Sr. No.	Dataset	Source
1.	Disability England and Wales: Census 2021	ONS
2.	Family Resource Survey (Financial Year 2020-21)	Gov.uk
3.	Disability and education, UK, 2021	ONS
4.	Disability and Wellbeing, 2022	ONS
5.	Disability and Loneliness, 2022	ONS
6.	Special Education Needs in England	Gov.uk
7.	Mental Health of Children and Young People in England, 2021	NHS England
8.	Disability and Employment	Gov.uk

3.2 Data Organisation

To investigate the status of disabled young people, explore the prevalence of mental health issues among disabled young people, and analyse participation levels across various social contexts, is a multifaceted task and requires involving many variables from various data sources. To ensure robust analysis, gather data from various sources related to disability, mental health, demographic factors, and social participation need to be integrated into a unified format, ensuring consistency in variables, units, and definitions.

The research will require generating dynamic results and outputs based on changing and combinations of variables effectively. Simply analysing data in an Excel spreadsheet or CSV file that contains many variables or large amounts of longitudinal data is not sufficient and effective. Data dashboards, such as Power BI, offer a wealth of benefits for research teams. It allows us to create charts, graphs, and maps to represent social indicators, trends, and patterns in an intuitive manner.

In the research, various social survey data, census information, and administrative records will be integrated using Power BI for easy accessing desired information and providing Real-Time Insights.

3.2 Data Analysis and Visualisation

Data has been analysed using different visualisations available in the Power BI and Excel. For big datasets, interactive analytical Dashboards have been made for easy accessibility of desired information. The dashboard shown in the Fig 1 using the Census 2021 dataset provides information about different statistics of disabled people for different boroughs of the UK and for different age groups. The dashboard presents information about different types of disability as classified by the Census 2021.

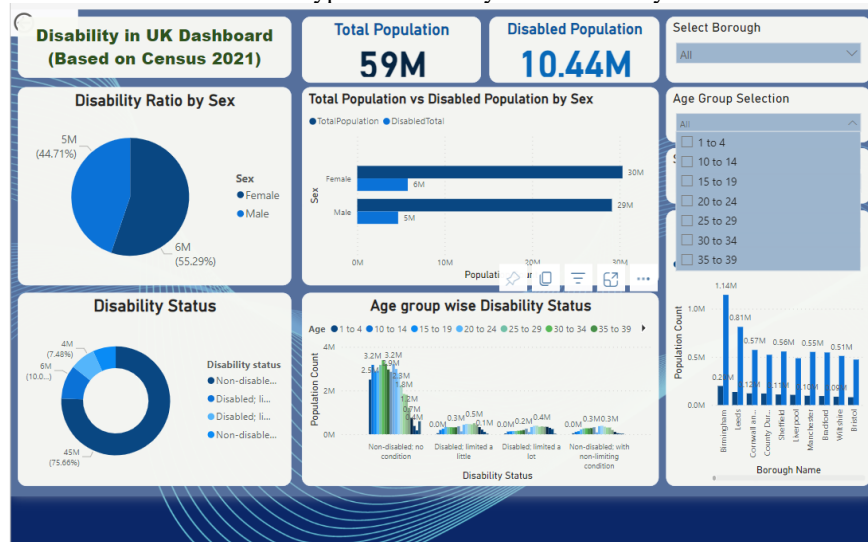


Fig. 1. Disabled Population in the England and Wales.

The dashboard can provide many information depending upon the chosen filters shown on the right side on the top of the dashboard for borough, age, and sex. Different combination of filters can also be used for comparison between different age group as well as for different boroughs of UK. Disability status tab provides the ratio of different types of disability as per the census 2021, gender wise disabled population comparison with respect overall population for the selected filters can be seen through horizontal bar charts shown at the centre of the dashboard. Further, age group wise disability status can also be seen on the dashboard which can be used for comparing different age groups for the selected borough(s). Therefore, the information on the dashboard can provide various information for data-driven decision-making by researchers or policy makers.

We can find the status of disabled young people based on the Census 2021:

Overall Statistics of All Ages Disabled People

- In England, in 2021, a smaller proportion but larger number of people were disabled (17.7%, 9.8 million), compared with 2011 (19.3%, 9.4 million).
- In Wales, in 2021, a smaller proportion and a smaller number of people were disabled (21.1%, 670,000), compared with 2011 (23.4%, 696,000).
- The English region with the highest proportion of disabled people was the North East (21.2%, 567,000).
- Out of all local authorities across England and Wales, Blackpool (24.7%), Blaenau Gwent (24.6%) and Neath Port Talbot (24.6%) had the highest proportions of disabled people.

In England, the census data on disability within households show that:

- In 68.0% (15.9 million) of households, no people are disabled
- 25.4% (6.0 million) of households include one disabled member
- In the remaining 6.6% (1.6 million) of households, two or more people are disabled within the household

Statistics about Young Disables (England and Wales)

- Total Population of Young - 7 million, young disable population - 863.86 K.
- Young Disable Population by gender - 387K (44.84 %) male and 476K (55.16%) Female
- Disability Status percentage -
 - Disabled Limited A lot - 278385 (3.8%)
 - Disabled Limited A Little - 585435 (8.37%)
 - Non-Disabled with Non-Limiting Condition - 357965 (5.12%)
 - Non-Disabled with no limiting Condition - 5774905 (82.54%)
- Borough with highest Population of young disables - Birmingham, Leeds, and Manchester

To further investigate the statistics of young disabled in Brent borough, the dashboard filters have been changed as shown in Fig. 2 to provide the statistics of disability for the age group (15-24) for Brent. The dashboard selection in Fig 2 tells us that the Total population of age group (15-24) in Brent is 45K (in 2021 as per Census 2021 data) and the disabled population is 3150 for the age group. It also provides that as per the Census 2021 data, the ratio of disabled females is 55.56% while for males it is 44.44%. It also provides the percentage and count of disabled persons with different levels of limitation on their activity (as categorised in Census 2021) within the Brent borough of London.

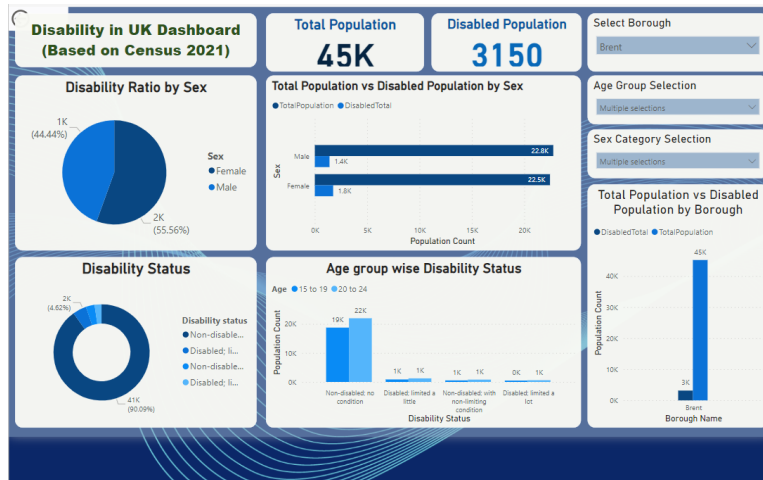


Fig. 2: Power BI Dashboard example for Brent (Age Group 15 to 25)

Further, to understand the participation levels of young disabled people within different social contexts attempts have been made to understand their engagement in leisure activities, education, and employment activities from the available data shown in Table 2.

With respect to leisure activities, no reliable or conclusive data can be found at the borough level for the UK. Further attempts might be needed to collect information for the borough of interest and the study with the help of the Local Authority and NGOs. However, to estimate the feeling of engagement, the feeling of loneliness has been analysed from the Disability and Loneliness, 2022 datasets, available at the Office of National Statistics which contains the information from Community Life Survey. Table 2 provides the information about feelings of loneliness for the young disabled (age 16 to 24 years) in the UK. Further, it is to note that the information about loneliness is not available at the borough level.

Table 2. Feeling of Loneliness felt by age 16 to 24 as per Community Life Survey.

Sr. No.	Disability Status	Feeling of Loneliness (Year Ending March 2021- Estimate %)
1.	Disabled people	28.1
2.	Disabled people	71.9
3.	Non-disabled people	5.7
4.	Non-disabled people	94.3

Similarly, to understand the situation with respect to education, the Disability and Education, 2021 dataset has been analysed. Fig. 3 shows the comparison between disabled and non-disabled people for the age group of 21 to 24 years of age. It is to note that information is available on Education for different age groups, however, as this

study aims to understand the situation of young disabled the age group of 21 to 24 years has been chosen for comparison.

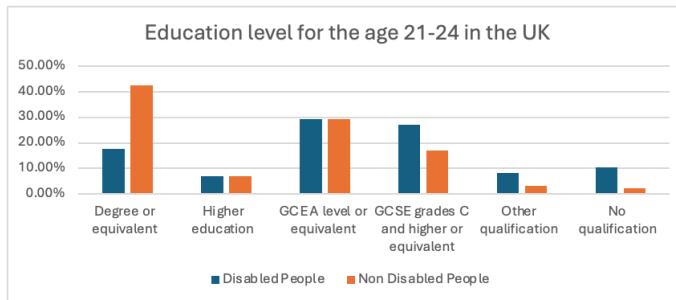


Fig.3. provides the statistics about education level of disabled and non-disables population for the selected age group of 21 – 24 years for the UK.

To analyse the current situation of Students with Special Education Needs (SEN), a dashboard like shown in Fig 4 can be created, which can help provide multiple information to the researchers and the policy holders. The SEN dashboard in Fig 4 also provides information for different age groups and for different boroughs. Depending on the interest and need of the analysis the filters can be selected from the top right of the dashboard. It also provides information about different disorders for different age groups - for the selected borough which can be very helpful for policymakers for making data-driven policy and to organisations that are working in different focus areas to support the disabled and bring them into the mainstream and supporting them feel inclusive. The dashboard in Fig 4 also provides information for different region and year-wise comparison for the number of SEN students.

Similarly, information with respect to different types of disability in the students with special education needs for different ethnic groups can be made available for different boroughs as shown in Fig 4 for the Brent (note for visual clear and legible, all ethnicities have not been included in the figure). All these information can be made available for each borough and for different age groups.

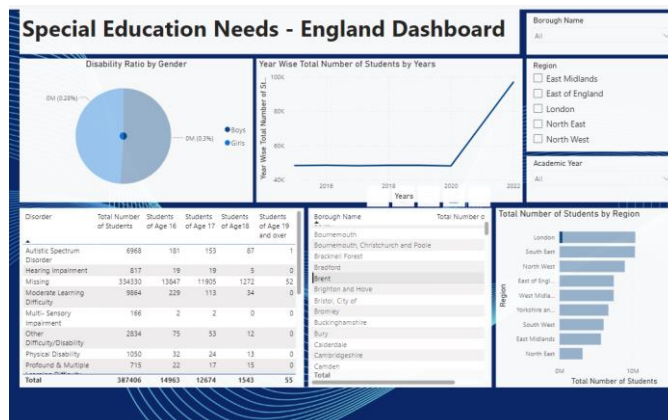


Fig. 4. SEN statistics for different borough, regions.

The following Fig 5. from the dashboard shows different Types of needs of disabled school children in different ethnicity groups. It indicates that “missing” and “Speech, Language and Communications needs” is the highest listed needs of disabled school children in all ethnicity groups in Brent.

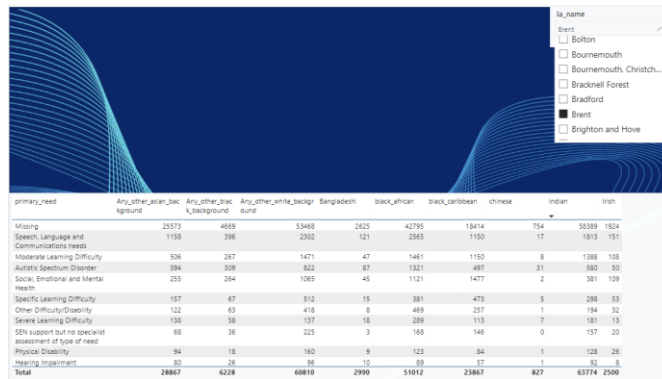


Fig. 5. Different Types of Needs of Disabled School Children in Brent

For analysing the engagement in terms of employment, the Employment data from the Department of Work and Pension has been analysed and results are shown in Fig 6. Further, as our area of focus is the young disabled, the age group of 18 to 24 years has been taken into consideration for the analysis. Also, the information is available at the borough level, however, the whole UK has been selected for the visual in the figure 6.

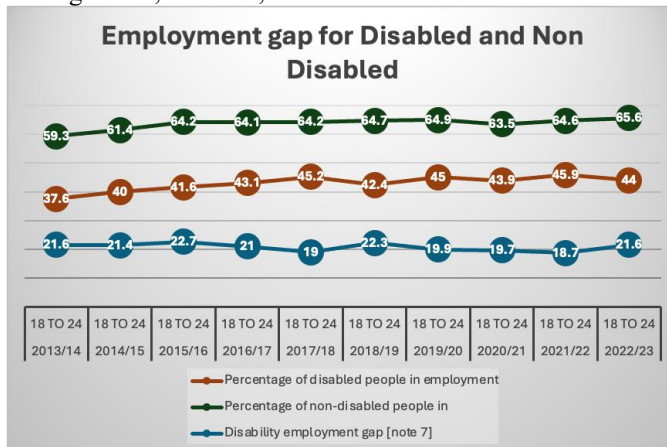


Fig. 6. Employment statistics for Young Disabled and Non-Disabled Population in UK (Age group – 18 to 24)

Further, to understand the prevalence of mental health problems among young people with disabilities the dataset – Mental Health of Children and Young People in England has been analysed. The results, for the age group of 17 to 23 years, are shown in the Table 3. Table 4 provides the information about different types of disability among disabled people in the UK based on Strengths and Difficulties Questionnaire (SDQ). Information about different types of disability is available for different regions

of the UK, however, it is not available at the borough level. Different statistical estimates can be made to derive the information at the borough level.

Table 3. Information about mental health among young

	Age 17 to 23 years old
Unlikely to have a disorder	69.9 %
Possible disorder	13.2 %
Probable disorder	16.9%
Girls	
Unlikely to have a disorder	63.4%
Possible disorder	13.2%
Probable disorder	23.5%
Boys	
Unlikely to have a disorder	76.1%
Possible disorder	13.3%
Probable disorder	10.7%

Table 4. Information about different types of disability as per the Family Resource Survey 2021

Impairment type/ Year	Percentage of disabled people		
	2018/19	2019/20	2020/21
Mobility	48	49	46
Stamina/ breathing/ fatigue	36	36	33
Dexterity	26	25	23
Mental health	27	29	29
Memory	16	16	11
Hearing ²	13	13	10
Vision	12	12	9
Learning	14	14	11
Social/ behavioural	9	9	8
Other	18	17	23
Sample size	10,024	10,144	5,026

4 Results discussion

This research paper explores the utilization of interactive dashboards in providing comprehensive information for researchers and policymakers to make data-driven decisions regarding disability and SEN in the UK. Various dashboards are discussed, showcasing their ability to present data on disability types, age demographics, borough-

wise statistics, educational attainment, and employment status among disabled and non-disabled populations. The paper underscores the importance of such dashboards in facilitating informed decision-making processes.

Interactive dashboards have emerged as powerful tools for accessing and analysing complex data sets, enabling users to glean valuable insights efficiently. In the context of disability and SEN, where nuanced data analysis is crucial for effective policymaking, these dashboards play a pivotal role in providing comprehensive information.

The dashboards discussed in this paper offer a range of functionalities aimed at catering to the diverse informational needs of researchers, policymakers, and organisations involved in disability advocacy and support. By employing various filters such as borough, age, sex, and disability type, users can customize their data queries and comparisons, thereby facilitating targeted analyses.

Key Findings and Analysis:

- **Disability Distribution:** The dashboard in Figure 2 provides a detailed breakdown of disability types across different demographics, allowing for comparisons between age groups and boroughs. This information is invaluable for understanding the prevalence of disabilities and tailoring support services accordingly.
- **Special Education Needs (SEN):** Figure 4 depicts a dashboard specifically designed for analysing SEN statistics, offering insights into age and borough-wise trends. By highlighting different disorders prevalent among students, policymakers can devise strategies to address specific educational challenges faced by this demographic.
- **Ethnic Disparities:** Figure 5 illustrates the distribution of disability types among school children in Barnet borough across various ethnic groups. Such data sheds light on potential disparities in access to support services among different ethnic communities, prompting targeted interventions.
- **Education and Employment:** Figure 3 and Figures 6 present statistics on educational attainment and employment status among disabled and non-disabled populations. These visuals enable policymakers to identify areas requiring intervention, such as reducing the education and employment gaps between these groups.

5 Conclusions and further work

The availability of comprehensive data through interactive dashboards empowers stakeholders to make informed decisions concerning disability inclusion and support services. By leveraging these tools, policymakers can devise targeted interventions, allocate resources effectively, and track progress over time. As such, the utilization of dashboards represents a significant step towards fostering inclusivity and equity for individuals with disabilities and special education needs.

Continued advancements in dashboard technology, coupled with ongoing data collection efforts, hold promise for enhancing the granularity and accessibility of disability-related information. Future research could focus on refining dashboard functionalities, expanding data sources, and assessing the long-term impact of data-driven policymaking on disability outcomes.

For further qualitative research, consider exploring narratives from disabled young people themselves. Their lived experiences enrich our understanding and guide policy recommendations.

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