The TCD Sense Map's Role in Fostering Sensory Inclusivity at Trinity College Dublin.

Declan Treanor, Faolan Doecke Launders, Kieran Lewis

Trinity College Dublin, dtreanor@tcd.ie

Abstract.

Trinity College Dublin's commitment to inclusivity has taken a significant leap forward with the development of the TCD Sense Map [Link: https://tcdsensemap.ie/ (Trinity disAbility Hub, 2023)]. This innovative tool was designed to empower Trinity students and staff to better navigate college environments, by providing detailed information on the sensory characteristics, physical access, and use of spaces. It further provides a platform for students and staff to share knowledge about various spaces. This article delves into the project's background, objectives, and the collaborative efforts that made it possible, highlighting its impact on creating a more inclusive educational environment. This development is part of the overall TCD Sense project at Trinity College Dublin, which focuses on sensory inclusivity for neurodivergent students as well as the whole university community. The project aims to enhance sensory experiences across the campus, incorporating neurodivergent perspectives in planning and execution. It involves a collaborative effort across various university departments, emphasising the importance of user feedback and continuous updates. The initiative is part of a broader commitment to inclusivity and accessibility in higher education, illustrating Trinity College's dedication to supporting.

Keywords: Inclusion; Neurodivergent students; Sensory experience; Universal Design for Learning,

1. Introduction.

The importance of inclusive practices in higher education has gained prominence in recent years, with a specific emphasis upon the need to create inclusive environments for neurodivergent students effectively. Trinity College Dublin recognised the challenges posed by sensory issues in its bustling campus environment (Nolan, Doyle, Lewis & Treanor, 2023), leading to the initiation of the TCD Sense Project. The project is guided by the principles informed by Universal Design for Learning (UDL), Dunn's Sensory Processing Framework

(Dunn, 2014), as well as the Person Environment Occupation Model (Law et al., 1996).

The key principles of the TCD Sense are as follows:

1. **Diverse Sensory Experiences:** Recognising that sensory experiences are unique to everyone, TCD Sense ensures that there is not a one-size-fits-all approach. Instead, there are a variety of spaces created to cater to different sensory preferences and requirements.
2. **Inclusivity and Accessibility:** TCD Sense is built on the foundation of inclusivity. By considering various sensory needs, we aim to make spaces that are accessible and reflect the neurodiversity of the student and staff community here in Trinity.
3. **A Holistic Approach:** Trinity is a place where students and staff come to learn, work, socialise and relax. TCD Sense takes a holistic view of college life, by creating spaces for the broad range of activities that make up life here in Trinity.
4. **Adaptive and Evolving:** As we learn more about sensory needs and gather feedback from the TCD community, TCD Sense will continue to evolve. Spaces might be adjusted, new spaces might be introduced, and old ones might be reimagined.
5. **Education and Awareness:** An integral part of TCD Sense is to raise awareness about the importance of sensory environments and how they impact well-being, learning, and daily functioning. It is about informing and educating the larger community on why these spaces matter.
6. **A Collaborative Effort:** TCD Sense is not an isolated initiative. It involves collaboration with students, faculty, and external experts to ensure the spaces created are genuinely beneficial.

The importance of inclusive practices in higher education cannot be overstated, especially in supporting neurodivergent students who may face sensory challenges in bustling campus environments. The Trinity Sensory Processing Project, or TCD Sense, is Trinity College Dublin's innovative response to this need, embodying a co-produced approach to enhance inclusivity and accessibility. This paper provides an overview of the project, its objectives, activities, and coproduced approach to enhance inclusivity in higher education. It further gives a detailed outline of the development of TCD Sense Map, which is currently in use in Trinity.

2. Incorporating Universal Design for learning Focused on Environmental Needs of Neurodivergent People.

Universal Design for Learning (UDL) is a framework that advocates for the creation of learning environments accessible and beneficial to all students, regardless of their learning style or sensory processing needs. In the context of the TCD Sense project at Trinity College Dublin, UDL principles are crucial in addressing the environmental needs of neurodivergent students. The project's commitment to UDL is evident in its initiative-taking approach to crafting a campus environment that is cognisant of and responsive to the sensory preferences and requirements of neurodivergent individuals. This involves creating spaces that reduce sensory overload, such as quiet areas with minimal auditory and visual distractions, and incorporating elements that cater to various sensory needs, like adjustable lighting and comfortable seating options.

Furthermore, the TCD Sense project extends the UDL principles beyond physical spaces, integrating them into the digital realm as well. This includes ensuring that online platforms and digital resources are accessible, intuitive, and adaptable to diverse sensory needs, thereby supporting the overall learning and engagement of neurodivergent students.

The TCD Sense project's application of UDL principles signifies a comprehensive and empathetic understanding of the diverse sensory experiences of neurodivergent students. By prioritising these principles in both physical and digital environments, Trinity College Dublin demonstrates a commitment to creating a learning atmosphere that is not only inclusive but also empowering for all members of its community.

2.1 Background.

Sensory processing issues can significantly impact the academic and social experiences of neurodivergent students in Higher Education (Clince et al, 2016; Thompson et al., 2019). Research undertaken within Trinity provided further information on the sensory experiences of disabled students (Nolan et al., 2023), which combined with sensory audits carried out by Occupational Therapists in the Disability Service in Trinity and survey data from the Trinity Library, provided a basis for TCD Sense project. While traditional solutions have provided some relief, the TCD Sense project introduces a more holistic and inclusive approach. It aims

to create a variety of sensory spaces and raise awareness about sensory challenges, moving beyond the conventional methods to embrace a campus-wide strategy.

2.2 Objectives of TCD sense.

The Project's Objectives[1] (Trinity College Dublin, 2023) are multifaceted, focusing on enhancing sensory inclusivity, incorporating sensory considerations into new and existing facilities, raising awareness, and promoting a coproduced approach. The involvement of neurodivergent individuals in planning and execution ensures the strategies are grounded in real-life experiences and needs.

Figure 1: A segment of the map showing the East End of the Trinity Campus. The image shows many examples of buildings and a variety of student spaces.

2.2.1 Project activities.

TCD Sense unfolds through various strands, including direct student approaches, improving the college environment, awareness and training initiatives, and research for wider impact. Each strand plays a crucial role in creating individualized support plans, improving spaces, and fostering an environment where every student feels supported.

[1] http://www.tcd.ie/disability/services/tcdsense.php

2.2.2 Co-created, co-designed, and co-produced approach.

The Trinity disAbility Hub[1] (Trinity College Dublin, 2023) recently opened in November 2023 is an innovative space for the Trinity disabled community. Central to the hub and TCD Sense is its co-produced methodology, ensuring that disabled/neurodivergent voices are integral in decision-making processes and everything we do. This collaborative approach enhances the project's relevance and effectiveness, ensuring that it truly resonates with the community it serves.

2.2.3 Partnerships and collaborative efforts.

The project is a testament to the power of collaboration, with partnerships across Trinity's student unions, societies, academic schools, and student services. Each entity brings unique strengths and insights, culminating in a rich tapestry of support and innovation. The TCD Sense Map exemplifies how technology and empathy can intersect to create meaningful, tangible change. It's a testament to innovation driven by community needs.

There was much to learn during development, such as the way in which the layout of a map presents information in an easily accessible manner, serving as an intuitive mode to display detailed data. Using symbols, colours, and spatial organisation the map can convey understanding by offering a visual representation of the sensory landscape transcending barriers in communication and enhancing comprehensive and efficient interpretations. Also, the nature of coordinating all the necessary input from the departments and standardising this so that it can be displayed in the same format across the board. This familiar format would be critical in improving the quality and effectiveness of communications to the college community.

Many skills were developed when presenting the project to student-based groups and organisations to enhance the map by ensuring it would be central to student life. By combing their feedback and suggestions, collaboration became focal to the project’s design. With the leaders of the student community embracing the project as an essential component of the university experience. Involving the student community would be paramount to its adoption universally across campus.

[1] https:/www.tcd.ie/disability/about-us/disability-hub/

2.2.4 Funding and partnership model.

The project's funding model highlights the collective commitment of the university community, with contributions from various sectors, including the HEA (Higher Education Authority) Strategic funding, the library, student bodies, and Estates and Facilities. This collaborative funding approach underscores the shared responsibility in promoting inclusivity.

2.2.5 Innovations of the TCD sense map.

The TCD Sense Map is not just a tool but a revolution in campus navigation. It provides detailed, customisable information about sensory-friendly spaces, integrating user feedback and focusing on overall accessibility. This map is a significant stride towards accommodating diverse sensory needs. The TCD Sense Map aims to empower students to navigate to the college environment to meet their sensory preferences. The focus is upon enabling students to participate in college life, not escape it.

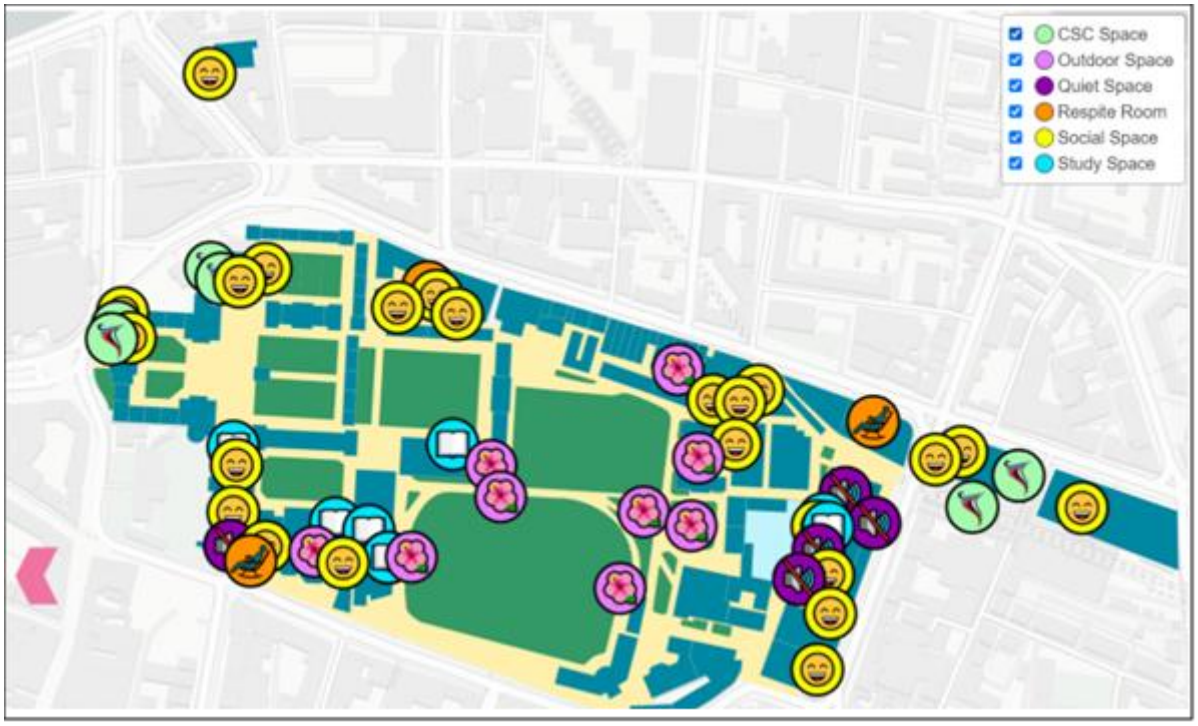

Figure 2: A zoomed out take of the map showing the main campus and the high density of Student Spaces indicated by colourful icons.

2.2.6 Utility at its core.

The map's practicality is evident in its detailed representation of campus amenities and

sensory spaces. A widescale audit of sensory and practical information was undertaken for each building, while also focusing on specific locations within to highlight critical areas of functionality and resource. Mainly driven by the absence of centralised, maintained, and accessible information at a university level. It therefore serves as an indispensable tool for the daily lives of students and staff, ensuring comfort, efficiency, and inclusivity. This audit was given to the Space Planning Team and Director of Student Services to be incorporated in an audit of student spaces to take place in semester two, 2023-24.

2.3 Features of the TCD sense map.

2.3.1 Detailed sensory information.

The TCD Sense Map goes beyond basic navigation, providing in-depth sensory information about various locations across the campus. Each area was evaluated for sensory stimuli such as noise levels, visual busyness, and tactile features. This allows individuals to anticipate and prepare for the sensory environment of each space, making campus navigation and utilisation more comfortable and less overwhelming.

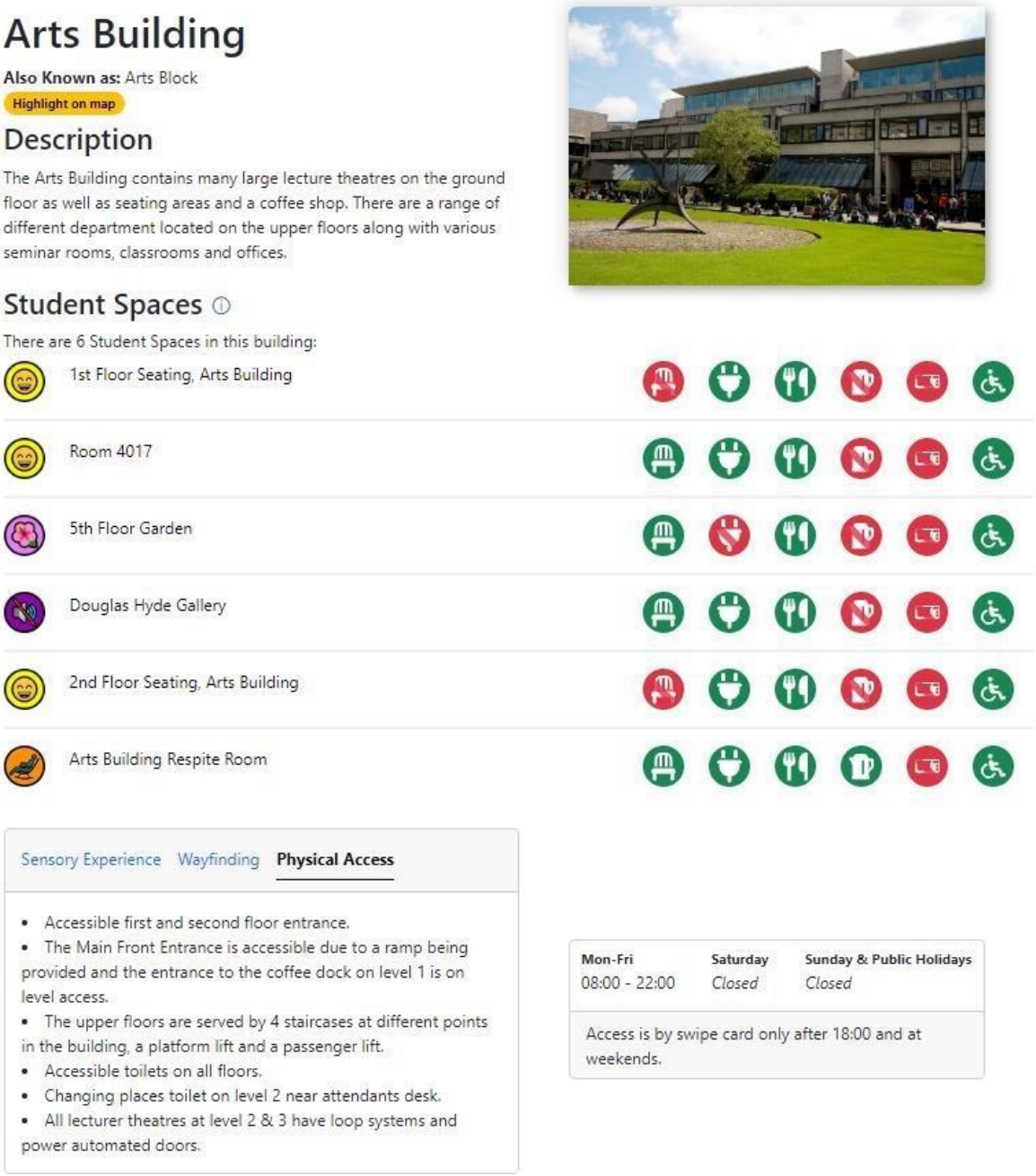

Figure 3: The building page for the Arts Building. The page contains an overview of all the collected information as well as links to Student Spaces within the building.

2.3.2 Customisable wayfinding and icons.

The map's innovative design includes customisable wayfinding features and icons representing different sensory and accessibility needs. Users can filter and select the types of

spaces they are interested in, such as quiet zones, areas with adjustable lighting, or spaces designed with minimal sensory stimulation. This customisation makes the map a flexible tool, adaptable to a wide range of user preferences and requirements.

2.3.3 Visual guides and building details.

Each building and space on the TCD Sense Map was accompanied by visual guides and detailed descriptions. This includes information on the type of sensory accommodations available, such as soundproofing, lighting options, and the availability of sensory tools or aids. Vital utilities such as seating/desks, sockets, and the limited availability of microwaves and kettles can be visually assessed. New students or visitors can use these visual guides to familiarise themselves with the layout and sensory characteristics of each location.

2.3.4 User feedback integration.

A unique and vital feature of the TCD Sense Map is the integration of user feedback. Users can contribute their insights and experiences regarding different spaces on the map, offering tips and recommendations. This crowdsourced information enriches the map's content and ensures that it remains up-to-date and reflective of the actual user experience on campus. Faolan Doecke-Launders, Chair of the Trinity Neurodiversity Society (DUNeS) and TCD Sense Map Lead: "*This map is our collective voice in design – it represents a campus that understands and celebrates sensory diversity. It's about creating spaces where everyone can thrive*." On the User-feedback system specifically "*It allows the map to be continually updated based on student experience – not always depending on administrator input therefore improving the real-time nature of the information presented to the benefit of students*." This also presents key points of interest for improving the campus experience by allowing individuals to add tips, with each space and building having their own set of user-generated tips. This also highlights any common faults such as reoccurring technical failures with lifts, automatic doors, and flickering lights which might go unnoticed and unreported by the general student body, staff, and visitors.

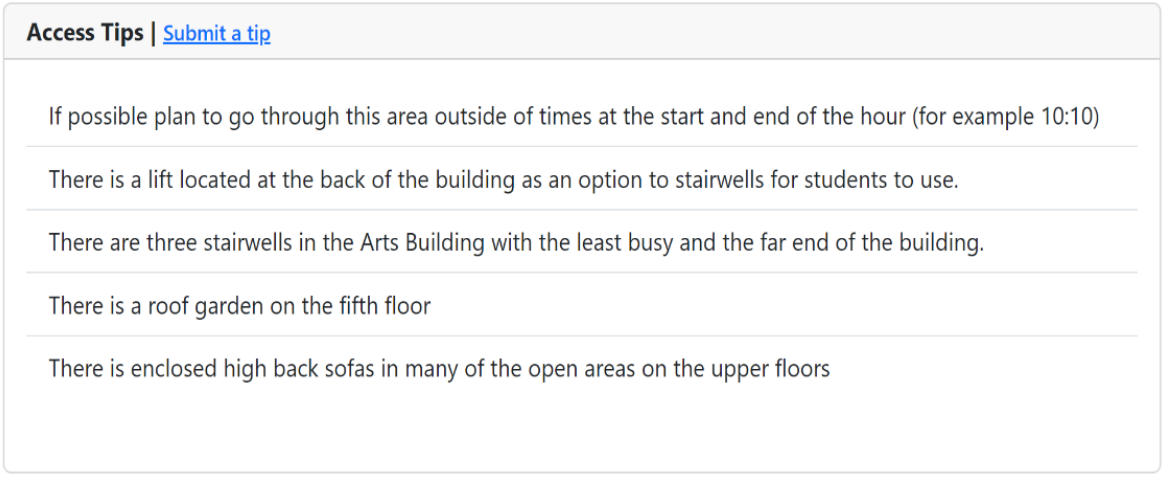

Figure 4: The Access Tips section of a page displays comments as "*tips*" submitted by students. This collects personalised and often underrepresented perspectives of certain areas, enhancing student usefulness and engagement.

2.3.5 Accessibility information.

The map was designed with a strong focus on accessibility. It includes detailed information about wheelchair access, elevator locations, and accessible routes. By providing this comprehensive data, the map ensures that all members of the Trinity community, regardless of their physical abilities, can navigate the campus efficiently and comfortably.

2.3.6 Sensory tips and strategies.

In addition to mapping sensory spaces, the TCD Sense Map offers tips and strategies for managing sensory challenges. This might include suggestions for avoiding highstimulation areas during busy times, locating emergency exits for quick departures, or finding the nearest quiet zone for a break. These practical tips empower users to take control of their sensory experiences and make informed decisions about their movement and activities on campus.

By incorporating these features, the TCD Sense Map stands as a robust tool for enhancing sensory inclusivity and accessibility at Trinity College Dublin. Its diligence, customisable features, and useroriented design makes it an invaluable resource for the entire college community, especially those with sensory sensitivities or accessibility needs.

3. Discussion.

3.1 Expanding UDL through technology-enhanced learning environments.

The TCD Sense project at Trinity College Dublin demonstrates a comprehensive approach to Universal Design for Learning (UDL), extending beyond physical modifications of the campus to embrace technology-enhanced learning environments. This approach acknowledges the diverse learning needs of neurodivergent students, offering support that aligns with their unique educational journeys.

1. **Interactive and Adaptive Learning Platforms:** Central to this approach is the development of interactive learning platforms that can be customised to cater to various sensory experiences, providing a range of audio-visual elements, interactive simulations, and textbased content. This versatility supports different learning styles and sensory processing needs.
2. **Accessible Digital Content:** The project places a strong emphasis on making digital content accessible, ensuring compatibility with screen readers, providing captions and transcripts, and using clear language to enhance comprehension. These measures are key to ensuring that neurodivergent students have equal access to digital learning materials.
3. **Virtual Reality (VR) and Augmented Reality (AR) Applications:** Exploring the potential of VR and AR, the project aims to create immersive learning experiences tailored to individual sensory needs, offering neurodivergent students a safe space to learn without the risk of sensory overload.
4. **Feedback-Driven Learning Tools:** The integration of tools that provide immediate feedback helps students understand their progress in real-time, allowing them to adapt their learning strategies as needed. This is particularly beneficial for neurodivergent students who may require more frequent reinforcement.
5. **Faculty Training in Assistive Technologies:** Essential to the success of these initiatives is comprehensive faculty training in using assistive technologies and adapting teaching methods to support neurodivergent students, equipping educators to create inclusive and supportive learning experiences.

3.2 Critique of the sensory space movement and advocacy for integrated sensory spaces.

An important aspect of the project is the critique of the broader sensory space movement in educational environments. Traditional approaches, which often segregate neurodivergent individuals into specialised areas, are contrasted with the TCD Sense project's advocacy for integrated sensory spaces. This approach aligns with UDL principles, ensuring environments cater to a wide range of sensory needs without segregating individuals based on neurodiversity. Integrated sensory spaces benefit all by providing adaptable environments and promoting inclusivity and understanding among all students.

3.3 Incorporating architectural and community co-creation in sensory-inclusive spaces.

A critical perspective in the discourse involves the role of architects, Estates Teams, and the broader community in designing inclusive spaces. Engaging deeply with Universal Design principles and the holistic approach, architects can create functionally inclusive spaces. Collaboration with the architectural community and co-creation with stakeholders leads to holistic inclusive design solutions that reflect diverse needs. These practices have implications beyond the Trinity College campus, serving as a model for inclusive environment design in various public and educational spaces.

By integrating these aspects, the TCD Sense project at Trinity College Dublin takes a forwardthinking approach to educational inclusivity. This blend of physical and digital inclusivity initiatives caters to current neurodivergent students' needs and sets a precedent for future innovations in inclusive higher education. The project's efforts in redefining spaces for broader societal impact underscore its commitment to fostering an inclusive society where diversity in sensory processing is celebrated.

4. Looking Forward: Next Steps and Direction.

As we celebrate the integration of the TCD Sense Map into Trinity's campus framework, the journey towards a fully inclusive environment continues. The project's next steps and direction are pointing towards ensuring that the map remains a living, evolving tool that reflects the changing needs and landscape of the university.

4.1 Updating the map.

Continuous updates will be a crucial aspect of maintaining the relevance and accuracy of the TCD Sense Map. The project team plans to regularly review and revise the map to include new sensory spaces, updated features, and any changes in the campus environment. This will involve working closely with the Estates and Facilities department, as well as other key stakeholders, to monitor physical changes on campus and reflect them in the map.

4.2 User feedback and improvement.

User feedback will continue to be an integral part of the map's development. The project will implement mechanisms for gathering and incorporating feedback from a wide range of users, including students, staff, and visitors. This feedback will not only inform the regular updates of the map but also help identify areas for improvement and innovation in sensory inclusivity across the campus.

4.3 Integration in college events and activities.

The TCD Sense Map will be promoted and integrated into college events, orientations, and activities. By making the map a standard resource during such events, the college aims to familiarise new and existing members of the community with this tool, encouraging its widespread use. Additionally, the map will be used in planning and organising events to ensure they are accessible and comfortable for all participants.

4.4 Communication strategy.

A robust communication strategy has been developed to promote the TCD Sense Map and raise awareness about sensory inclusivity. This will involve collaboration with the college's marketing and communications team to create promotional materials, feature stories, and regular updates about the map. The strategy will also leverage social media, the college website, and other digital platforms to reach a broader audience.

4.5 Development of college universal sensory guidelines.

Building on the success and learnings from the TCD Sense Map, the college plans to develop universal sensory guidelines. These guidelines will provide a framework for incorporating sensory considerations into all aspects of campus life, from the design of new buildings and

renovation of existing spaces to the organisation of events and activities. The guidelines will be co-produced with input from neurodivergent individuals and other key stakeholders, ensuring they are comprehensive, practical, and reflective of diverse needs. By focusing on these next steps and directions, Trinity College Dublin reaffirms its commitment to creating an environment where everyone, irrespective of their sensory profile, can thrive. The TCD Sense Map is not just a tool for navigation; it is a steppingstone towards a more empathetic, understanding, and inclusive university community.

4.6 Outcomes and future directions.

The TCD Sense project has led to positive outcomes such as improved sensory inclusivity and enhanced academic experiences for neurodivergent students. Future objectives include expanding sensory spaces, incorporating sensory considerations into new facilities, and integrating sensoryinclusive practices into the curriculum. Collaborative research and the sharing of best practices are crucial for the advancement of these goals.

5. Conclusion.

The TCD Sense Map at Trinity College Dublin represents far more than just a navigational aid; it is a symbol of a profound commitment to inclusivity and a beacon of innovation in higher education. This project transcends traditional approaches to sensory inclusivity, setting a new benchmark not only for academic institutions but for inclusive practices in wider society.

1. **Transformative Impact on Educational Practices:** The TCD Sense Map has revolutionised how educational environments cater to diverse sensory needs. By integrating Universal Design for Learning principles, the project has demonstrated a deep understanding of neurodiversity, leading to significant enhancements in the academic and social experiences of neurodivergent students. Its success lies in recognising the unique sensory experiences of each individual and providing a platform where these needs are not just accommodated but actively embraced.
2. **Empowerment Through Technology and Community Engagement**: The project exemplifies the power of technology in creating inclusive environments. Through its innovative use of digital tools and platforms, it has empowered students and staff to share knowledge and contribute to a continuously evolving sensory landscape. Furthermore, the TCD Sense Map has harnessed the strength of community

engagement, showing that when diverse voices are included in the decision-making process, more effective and empathetic solutions emerge.

3. **A Model for Inclusivity Beyond the Campus:** The reach of the TCD Sense Map extends beyond the confines of Trinity College. It serves as an inspiring model for other educational institutions, businesses, and public spaces, demonstrating how inclusive design can be effectively implemented. The principles and methodologies employed in this project provide a template for others to follow, encouraging a broader movement towards sensory inclusivity in various environments.
4. **The Journey Ahead:** As we look to the future, the journey towards a fully inclusive environment at Trinity College Dublin and beyond continues. The TCD Sense project, with its commitment to regular updates, user feedback, and integration into college events, is poised to evolve and adapt to the changing needs of its community. The development of universal sensory guidelines promises to extend the project's impact, guiding future initiatives and reinforcing the college's dedication to an inclusive educational landscape.
5. **A Beacon of Hope and Collaboration:** Ultimately, the TCD Sense Map stands as a testament to what can be achieved through understanding, collaboration, and a shared commitment to inclusivity. It symbolizes a future where diversity in sensory processing is not only recognized but celebrated. It is a beacon leading toward a more inclusive world, showing that when a community unites in support of its diverse members, remarkable transformations are possible.

In conclusion, the TCD Sense Map is not merely the culmination of innovative thought and collaborative effort; it is a pioneering step towards a more inclusive and empathetic world. Its development and implementation at Trinity College Dublin offer valuable insights and practices that can inspire and guide other institutions and communities in their journey towards embracing and celebrating diversity in all its forms.

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