Assessment 1: Innovation And Research.

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Module Name: Changemakers: Creativity and Value Creation

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Task 1

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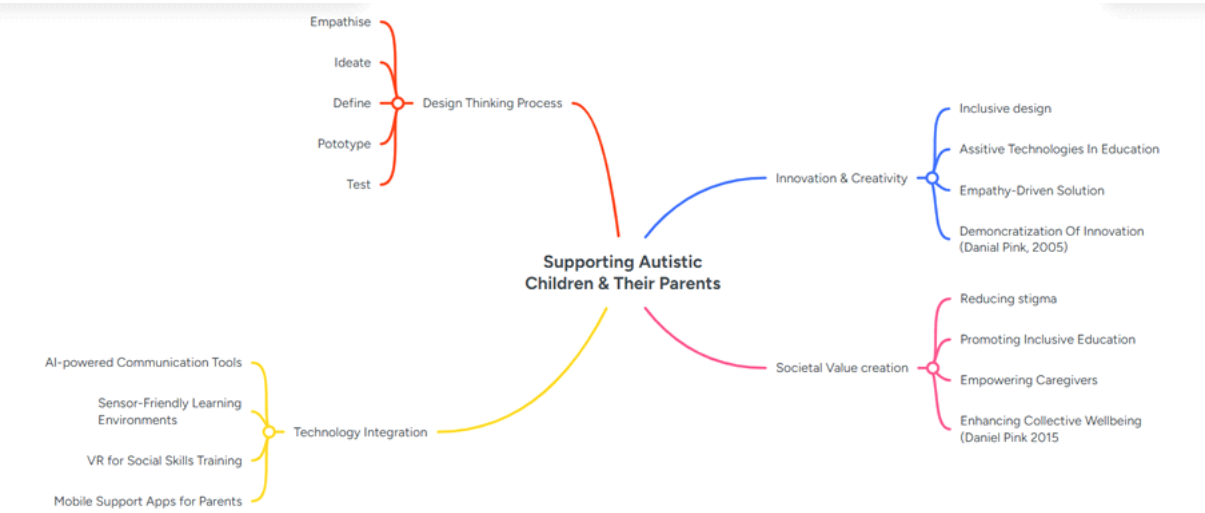
Task 1
Q.1.
The Mind Map



Supporting Autistic Children and Their Parents Through Inclusive Innovation

Q.2.

Creativity, Innovation, and Design Thinking

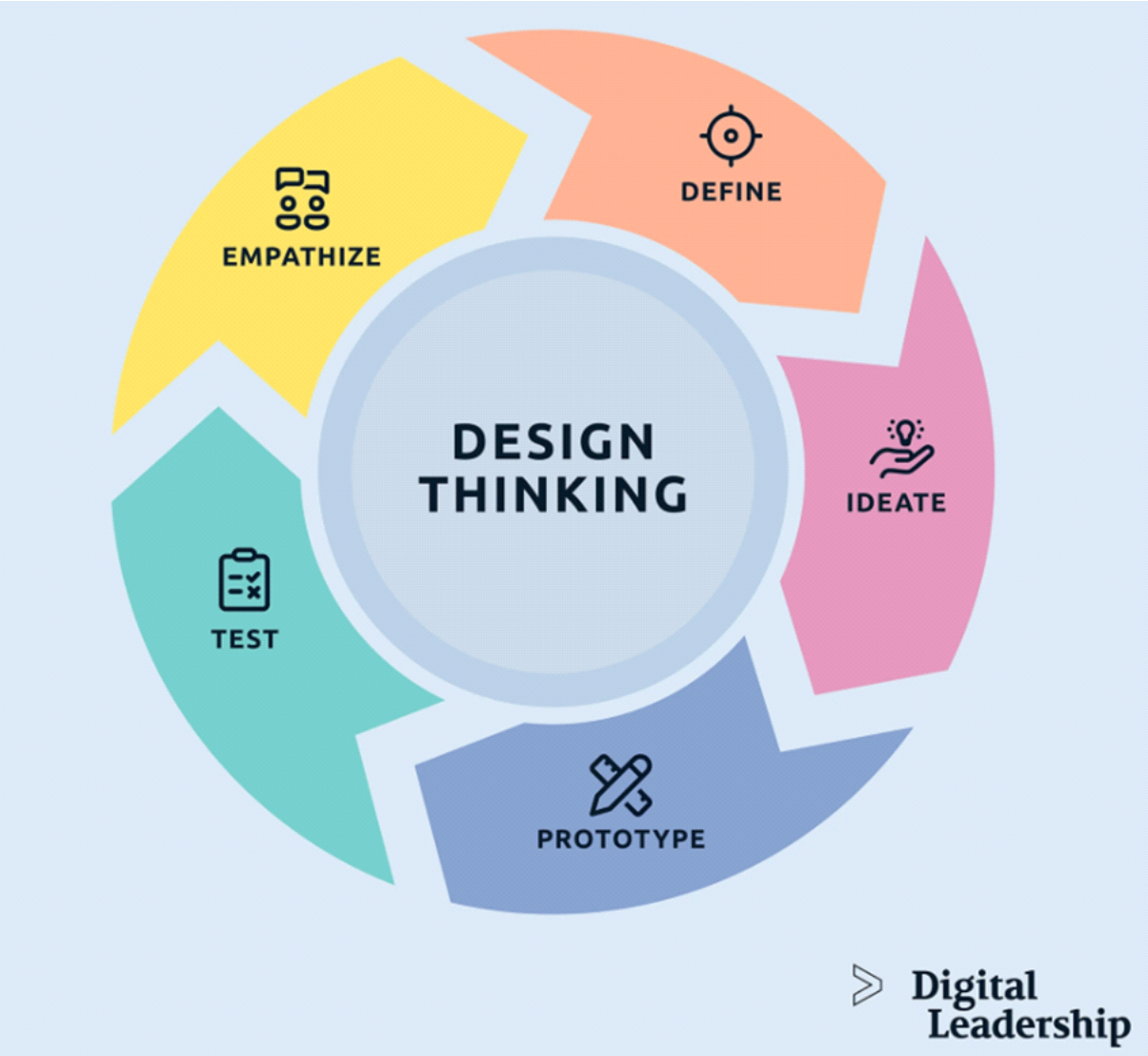
This mind map explores how creativity and innovation can be harnessed to support autistic children and their parents, addressing both emotional and practical challenges. It is structured around four interconnected themes: the Design Thinking Process, Innovation and Creativity, Societal Value Creation, and Technology Integration. Together, these themes highlight the transformative role of innovation in shaping both society and the individual, while ensuring that solutions remain inclusive and empathetic.

Design Thinking Process

The Design Thinking Process provides the foundation for this project. Design thinking is a human-centred approach to innovation that begins with empathy. In this context, empathy means recognising and understanding the lived experiences of autistic children and their caregivers, including challenges such as sensory overload, communication barriers, and social exclusion. By foregrounding empathy, the process ensures that solutions are not only technically effective but also emotionally resonant.

The process continues by clearly defining these challenges, ideating possible solutions, prototyping tools such as mobile applications or virtual reality environments, and testing them with real users. This iterative cycle enables continuous refinement, ensuring that the final product accurately reflects authentic needs rather than abstract assumptions. Importantly, design thinking fosters collaboration between designers, families, educators, and professionals, making the innovation process inclusive and impactful.

By embedding creativity and innovation into this structured process, the project seeks to generate tools that enhance communication, emotional regulation, and parental support. As Brown (2009) argues, design thinking is not simply about problem-solving but about re-imagining possibilities through empathy and collaboration. In this way, the project positions creativity and innovation as practical, human-centred acts that can transform the everyday lives of autistic families while contributing to broader societal values of equity and inclusion.[1]



Design Thinking Process [2]

Innovation is not confined to the development of new inventions; rather, it is about solving meaningful problems in ways that create value for individuals and society. The Cambridge Dictionary defines innovation as “a new idea or method, or the use of new ideas and methods.” Within the context of supporting autistic children and their parents, innovation refers to the creation of inclusive tools and environments that respond to their unique needs. Daniel Pink (2005) argues that innovation has become democratised, meaning that everyone has the capacity to contribute. This project embraces that ethos by involving parents, educators, and autistic children themselves in the co-creation of solutions, ensuring that design outcomes are both relevant and empathetic.

Creativity plays a central role in this process. Kelley and Kelley (2015) highlight that only 25% of individuals feel they achieve their creative potential, suggesting that creativity is often underutilised. Supporting autistic children requires a deeply creative approach, one that involves listening carefully, imagining alternative possibilities, and building new pathways for inclusion. By drawing on empathy and design thinking, creativity becomes a tool for unlocking innovative solutions. This project, therefore, positions creativity not as an abstract concept but as a practical, collaborative act that promotes inclusion and empowers families. [3] [4]

Societal Value Creation

Supporting autistic children is not simply a personal mission; it represents a broader societal imperative. Inclusive innovation has the potential to reduce stigma, promote neurodiversity, and enhance educational outcomes by ensuring that families and children are provided with tools that reflect their lived realities. By embedding empathy and accessibility into technological design, society can move towards greater equity and dignity for all.

Global evidence demonstrates the transformative power of innovation. Hans Rosling's work highlights how technological and social advances have contributed to reductions in poverty and improvements in education worldwide. This project builds on that vision by applying innovation to the context of autism, aiming to foster systemic support and collective well-being. Through the development of assistive technologies, families are empowered to navigate daily challenges with greater confidence and resilience.

Steven Pinker (2018) emphasises that societal progress is driven not only by material advances but also by compassion and inclusion. In this sense, the project contributes to wider social values by promoting empathy, understanding, and respect for neurodiverse communities. By creating tools and environments that support autistic children and their parents, inclusive innovation becomes a pathway to both individual empowerment and societal transformation.

[5]

Technology Integration

Technology is increasingly recognised as a powerful enabler of inclusive innovation, particularly in the context of supporting autistic children and their parents. Emerging tools such as AI-powered communication systems, including predictive text applications for non-verbal children, provide new opportunities to enhance interaction and reduce barriers to expression. Similarly, sensory-friendly smart environments can be designed to regulate stimuli, creating calmer and more supportive spaces for children with heightened sensory sensitivities. Blockchain-secured health records further contribute to inclusivity by ensuring that sensitive medical information is protected while remaining accessible to families and professionals.

The World Economic Forum (2016) identifies digital health and the Internet of Things (IoT) as key drivers of social and technological change, both of which are central to this project. Wearable devices, for example, can monitor stress levels through physiological indicators, offering parents valuable insights into their child's well-being. Mobile applications can complement these devices by providing real-time support, resources, and tailored guidance, thereby reducing parental stress and improving daily routines. Together, these innovations make care more accessible, personalised, and scalable. By integrating such technologies, the project aims to deliver practical solutions that are empathetic, evidence-based, and responsive to the lived experiences of autistic families. [6]

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Task 2

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Task 2

Wider Learning: Embracing Alternative Philosophies to Support Autistic Children and Their Parents

Q.1.

Aim and Objectives

The concept of “wider learning” highlights the importance of exploring alternative perspectives, challenging assumptions, and deepening our understanding of complex human needs. In the context of supporting autistic children and their parents, wider learning requires the integration of philosophical frameworks—ontology, epistemology, and axiology—into the design of inclusive, empathy-driven technology. Ontology enables the researcher to define the realities experienced by families, epistemology guides the processes through which knowledge about those experiences is collected and validated, and axiology ensures that ethical values underpin the research design and outcomes.

The overarching aim of this project is to develop a web-based assistive solution that enhances communication, supports emotional regulation, and provides parental guidance for autistic children. To achieve this aim, three key objectives have been identified. First, to engage with stakeholders, including parents and advisors, to identify user needs and priorities. Second, to prototype an adaptive tool that reflects these needs through accessible design features such as visual aids and simplified language. Third, to evaluate the tool’s impact through systematic feedback and usability testing, ensuring that it is both effective and empathetic. These objectives are grounded in a research philosophy that values practical outcomes while maintaining ethical responsibility.

Q.2

Research Philosophy

Ontology asks: What is the nature of reality? In autism support, this means recognising that autistic individuals experience the world in ways that differ from neurotypical norms. A subjective ontological stance acknowledges that each child’s sensory, emotional, and cognitive reality is valid. This perspective shifts us away from standardisation and toward personalisation. An IoT-based system tailored to autistic children’s routines, reflecting an ontological commitment to honouring diverse experiences. [7]

Epistemology explores how knowledge is formed and validated. Traditional approaches often rely on foundationalism, seeking universal truths through observation. However, a pragmatist epistemology offers a more flexible lens. Pragmatism asks: Does it work? A question that prioritises outcomes over rigid theory. [8] Emphasise that socially assistive robotics succeed when they adapt to real-world feedback and individual interaction styles.

Axiology examines what is valuable. In this project, it means prioritising ethical care and aesthetic dignity. Ethics guide us to treat autistic children and their parents with respect and autonomy. [9] The ethical challenges in AI-based autism tools reinforce the need for emotionally resonant and responsible design. Parental support systems must reflect emotional realities, not just clinical models. [10]

Wider learning encourages us to move beyond rigid frameworks. It means listening to autistic voices, involving parents in co-design, and integrating philosophical reflection into technical decisions. Supporting autistic children requires precisely that: a willingness to challenge assumptions, embrace complexity, and learn from alternative perspectives.

Q.3.

Search Tools and Strategies for Identifying Relevant Research

To ensure the rigour and relevance of my literature review, I employed three primary search tools: IEEE Xplore, PubMed, and Google Scholar. Each database was chosen for its disciplinary strengths and its ability to support the interdisciplinary nature of my project, which focuses on inclusive innovation for autistic children and their parents.

IEEE Xplore was critical for identifying technological research. As a leading repository of engineering and computer science publications, it provided access to studies on AI-powered communication tools, virtual reality environments designed to enhance social skills, and wearable technologies that support daily routines. These sources directly informed the technological dimension of my project, grounding proposed interventions in validated innovations.

PubMed was used to access biomedical and clinical literature. This database offered essential insights into autism spectrum disorder (ASD) prevalence, parental stress, and the efficacy of therapeutic interventions. Incorporating evidence from PubMed allowed me to contextualise technological solutions within broader health and wellbeing frameworks.

Google Scholar complemented these searches by providing interdisciplinary and philosophical perspectives. It was particularly useful for sourcing literature on design thinking, societal value creation, and the axiological and epistemological frameworks underpinning inclusive innovation. Boolean logic refined queries such as “autism AND parental support AND technology,” ensuring precision and comprehensiveness.

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Task 3

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Task 3

Research Strategies

Q.1.

Validity, Reliability, Generalisability, and Ethics

To enhance validity, I will ensure that my research instruments reflect the lived experiences of autistic children and their parents. This includes adapting validated tools such as the Social Responsiveness Scale (SRS-2) and the WHOQOL-BREF for parental wellbeing. I will also conduct expert reviews and stakeholder feedback sessions to ensure content relevance and emotional sensitivity. [11] [12]

Reliability will be supported through consistent procedures. Structured interviews and standardised Likert-scale surveys will reduce variability. A test-retest method will be applied to a subset of participants to assess internal consistency. Interviewers will be trained to ensure uniformity in delivery.

To improve generalisability, I will use stratified sampling to ensure diversity across age, gender, ethnicity, and communication styles. This reflects the principle of intersectionality in autism research. [13] Including both verbal and non-verbal children and caregivers from varied backgrounds ensures that findings are applicable across contexts.

Ethical considerations are central. I will follow person-oriented ethics, ensuring informed consent, emotional safety, and the right to withdraw. [13] Autistic voices and parental perspectives will be respected through co-design and participatory methods. Data will be anonymised and stored securely, following GDPR guidelines. [6]

Q.2.

Research Strategies and Pilot Data Collection

This study will adopt a mixed-methods approach, integrating qualitative interviews with quantitative surveys to ensure both contextual richness and statistical reliability. Qualitative interviews will be used to explore the emotional challenges faced by parents of autistic children, while quantitative surveys will measure usability and the potential impact of proposed assistive technologies. Recent multimodal autism assessment frameworks emphasise the value of combining qualitative and quantitative data to generate robust and comprehensive outcomes.[14]

For the pilot phase, a short questionnaire will be developed specifically for parents. This instrument will include Likert-scale items addressing stress, communication, and technology use, alongside open-ended questions designed to capture daily challenges and support needs. To enhance accessibility, the questionnaire will incorporate visual aids and simplified language. Distribution will occur through established autism support networks, ensuring relevance and reach. Additionally, two parent advisors will review the pilot instrument to provide feedback on clarity, emotional tone, and appropriateness. Based on their input and pilot responses, the questionnaire will be refined by adjusting language, modifying scales, and incorporating optional support prompts. This iterative process will strengthen the validity of the tool and ensure that it reflects the lived experiences of families navigating autism.

Q.3.

Outline of Quantitative and Qualitative Analysis

This study employs a mixed-methods design, integrating quantitative and qualitative analyses to fully characterise the impact of assistive technology on autistic children and their parents, capturing both objective outcomes and subjective experiences.

The quantitative dimension, drawing on structured survey data, will utilise descriptive statistics, including frequencies, percentages, and means, to summarise key variables such as parental stress, communication effectiveness, and technology usage rates. Data visualisation tools (charts and graphs) will be employed to articulate emerging trends clearly. Furthermore, inferential statistics will explore potential correlations, such as the relationship between technology adoption and reported parental stress reduction, allowing for cautious generalisation beyond the study sample.

The qualitative dimension, grounded in thematic analysis, will systematically code interview transcripts and open-ended survey responses. An iterative process will be used to identify initial, granular codes (#stress, #supportneeds, #visualaids) and subsequently aggregate these into broader, comprehensive themes. This approach ensures the authentic representation of participant voices, illuminating emotional challenges, identifying communication barriers, and gathering essential design feedback from parents.

The final synthesis of these findings provides a balanced perspective, leveraging statistical precision alongside contextual richness. This ensures the resulting technology design is both evidence-based and empathetically aligned with the needs of autistic families. [15]

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