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BSc (Hons) Health and Social
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Exploring the Role of Artificial Intelligence in Supporting Autistic Children in Mainstream Education: A Health and Social Care Perspective

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for the award BSc (Hons) Health and Social Care

ABSTRACT

The purpose of this dissertation was to explore how artificial intelligence (AI) can support autistic children in mainstream education, with particular focus on communication, emotional regulation and personalised learning. The research aim was to examine the opportunities and challenges associated with the use of AI for autistic pupils and to identify implications for health, social care and education. This topic is significant because autistic children often experience barriers within mainstream settings, and digital innovation is increasingly positioned as a tool for advancing inclusive practice (Department for Education, 2023).

A secondary, desk-based approach was adopted, involving the systematic retrieval and review of peer-reviewed literature published within the last ten years. A thematic analysis was undertaken following established guidance (Braun and Clarke, 2006), which enabled the identification of patterns across existing studies. Literature was coded and organised into three dominant themes: AI for personalised learning, AI-supported emotional and behavioural monitoring, and ethical and practical challenges relating to AI integration. Each theme was analysed in relation to the research aim and objectives.

Findings indicated that AI shows promise in improving accessibility, enhancing differentiated learning and supporting communication for autistic pupils (Li et al., 2024). However, concerns were identified regarding data privacy, algorithmic bias, over-reliance on technology and inequalities in digital access. Limited teacher training and inconsistent policy frameworks were also highlighted as barriers to effective implementation. These limitations have implications for real-world practice, particularly regarding safeguarding, ethical use and equitable provision in mainstream schools.

Recommendations include strengthening national guidance on AI use, improving staff digital literacy, ensuring transparent data governance, and embedding AI within whole-school inclusion strategies. Further research is required to explore the lived experiences of autistic pupils, teachers and families, particularly within UK contexts, to ensure AI is implemented safely, ethically and effectively across education and health and social care systems.

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CHAPTER 1: Introduction

1.1 Introduction

The integration of artificial intelligence (AI) into the support of children with autism spectrum disorder (ASD) has become a growing area of focus within health, education, and social care. Autistic children often experience challenges in communication, emotional regulation, and sensory processing, which can make inclusion in mainstream schools difficult (NICE, 2021). Recent developments in AI — such as assistive communication software, emotion-recognition systems, and adaptive learning platforms — have introduced new opportunities for supporting these children (Hayes and Dillahun, 2021).

Mainstream education aims to be inclusive, yet many autistic children still face barriers to equal participation and tailored support (Department for Education, 2023). Drawing on existing research and evidence, this study investigates how AI-based technologies are being used to enhance inclusion, communication, and learning outcomes for autistic children in mainstream education.

Aim

The research aims to explore how AI technologies support autistic children within mainstream UK education and to evaluate their implications for health and social care. The study seeks to deepen understanding by analysing existing evidence, identifying best practices, and discussing the ethical and practical challenges of AI in child-centred care.

1.2 Definitions and Terminology

Autism Spectrum Disorder (ASD):

A neurodevelopmental condition characterised by differences in communication, behaviour, and sensory processing. Autism Spectrum Disorder (ASD) can manifest in many ways, meaning that everyone may face unique challenges and strengths. Consequently, support strategies must be personalised to effectively meet everyone's specific needs (American Psychiatric Association, 2013).

Artificial Intelligence (AI):

Computer systems capable of simulating human cognitive functions, such as learning and problem-solving (Russell and Norvig, 2021). In this study, AI encompasses adaptive learning systems, Augmentative and Alternative Communication (AAC) technologies, emotion recognition software, and socially assistive robots designed to support autistic children (Adako et al., 2025; Sideraki & Anagnostopoulos, 2025).

Mainstream Education:

Traditional educational settings involve children with diverse needs learning together within the same environment. In the UK, inclusive education aims to ensure that children with Special Educational Needs and Disabilities (SEND) have equal access to learning opportunities alongside their peers.

This approach is underpinned by legislation such as the Equality Act 2010, which prohibits discrimination based on disability or other protected characteristics, and the SEND Review (DfE, 2023), which outlines policies and strategies to promote inclusivity, ensure appropriate support, and foster an equitable educational experience for all children regardless of their individual needs.

Health and Social Care:

Professionals and services that address physical, emotional, and developmental needs. For this dissertation, this includes school support staff, nurses, specialist therapists, social workers, and policymakers within education and care systems.

Acronyms and Abbreviations

- **ASD** – autism spectrum disorder
- **AI** – Artificial Intelligence
- **AAC** – Augmentative and Alternative Communication
- **SEND** – Special Educational Needs and Disabilities
- **DfE** – Department for Education

- **NICE** – National Institute for Health and Care Excellence

These terms will be consistently used throughout the dissertation to maintain clarity and coherence.

1.3 Rationale for Research

This research topic was chosen due to both professional and personal motivation. As the parent of a child with autism who currently attends mainstream education, I have observed how classroom environments can present difficulties in communication, social understanding, and emotional regulation. Despite inclusive education being a legal and ethical priority, many children on the autism spectrum still experience inconsistent access to support and tailored learning resources (Ballantyne et al., 2024; Hasson, 2024).

AI technologies such as emotion-recognition systems, adaptive learning software, and communication tools are being explored as potential supports, yet the real-world application of these innovations within education and care remains under-researched (Hayes and Dillahun, 2021; Iannone, 2023). Most studies focus on controlled or clinical environments rather than on how these tools function in everyday school settings (Adako et al., 2025).

Through critical engagement with existing literature and evidence, this research addresses gaps concerning how AI can be practically integrated into mainstream education to improve inclusion and well-being. The study contributes by evaluating both opportunities and challenges, supporting the development of more informed, ethical, and accessible practices for autistic children within health and social care contexts.

1.4 Aim and Objectives

The research aims to thoroughly explore the various ways in which artificial intelligence (AI) technologies are currently being utilised to support autistic children within mainstream educational settings. It also seeks to evaluate the broader implications of these technologies for health and social care practices.

To achieve this, the study reviews a wide range of published literature, official reports, and policy documents to gain a comprehensive understanding of current AI applications, including their potential benefits and inherent limitations when used to support autistic learners. The goal is to identify and highlight how technological advancements can improve communication abilities, foster greater inclusion, and promote emotional well-being among

autistic children. Furthermore, the research aims to inform and shape best practices in education and care by providing evidence-based recommendations that leverage AI effectively and ethically.

Objective 1: To explore how AI technologies contribute to personalised learning and adaptive educational support for autistic children in mainstream schools.

Objective 2: To investigate the role of AI in enhancing communication, emotional understanding and social participation for autistic pupils.

Objective 3: To examine the ethical, practical and data protection challenges associated with the use of AI for autistic children in mainstream settings.

Objective 4: To identify implications for policy, teacher training and future implementation within UK mainstream education.

1.5 Conclusion

This chapter has introduced the background and rationale for exploring how artificial intelligence (AI) can support autistic children in mainstream education from a health and social care perspective. It highlighted the personal motivation behind the study, stemming from my lived experience as a parent of an autistic child. It established the relevance of this topic within wider academic and policy discussions. Key definitions and concepts, such as ASD, AI, and mainstream education, were clarified to provide a strong foundation for the research. The chapter also outlined the overarching aim and four objectives that guide this study.

The next chapter will critically examine existing research and evidence on the use of AI to support autistic children. It will review what is already known, identify gaps in the literature, and provide a theoretical and contextual framework to support the development of the study's findings and analysis.

CHAPTER 2 – Background Information and Analysis

Understanding how artificial intelligence (AI) can enhance support for autistic children in mainstream education requires examining its historical development, theoretical foundations, and policy context. The integration of AI and assistive technologies into education has emerged from decades of technological innovation, evolving from early computer-assisted learning to intelligent systems capable of recognising emotion, adapting to individual needs, and facilitating communication. Exploring these developments provides essential context for evaluating AI's potential to address the persistent challenges faced by autistic learners, such as communication barriers and social inclusion.

The discussion that follows establishes a foundation for critical analysis by reviewing historical and theoretical progress in AI and autism education, alongside international trends and the UK's current policy environment. These perspectives are essential for understanding the complexity of integrating AI into educational and social care systems, particularly within mainstream school settings that aim to promote inclusion and equal opportunities for all learners.

2.2 Historical Background

The relationship between technology and autism education has evolved significantly over the past four decades. Early approaches in the 1980s and 1990s used simple computer-assisted learning programmes to develop communication and problem-solving skills among autistic children. As technology advanced, research in the early 2000s explored assistive communication devices and digital tools to support language acquisition and emotional understanding.

By the 2010s, advances in robotics and AI introduced more sophisticated tools. Research by the UCL Institute of Education demonstrated that social robots could engage autistic learners in ways that traditional teaching sometimes failed to achieve, offering consistent, non-judgmental interaction (UCL, 2020). Similar progress occurred internationally, with projects in Japan, the United States, and the Netherlands experimenting with machine-learning algorithms to personalise learning activities for children on the spectrum.

In the UK, assistive technology became a policy focus within education and social care by the mid-2010s. Reports commissioned by the Department for Education emphasised the value of technology in supporting pupils with special educational needs and disabilities (SEND). A 2025 pilot programme involving 4,000 schools introduced AI-powered assistive

tools designed to enhance communication and classroom engagement for children with SEND, including autism (Department for Education, 2025).

Key figures and organisations have shaped this development. Simon Baron-Cohen's cognitive theories of autism informed how educational software models behaviour and emotion. The National Autistic Society and research centres such as the Autism Centre for Education and Research (University of Birmingham) have also influenced inclusive technology initiatives.

Despite steady progress, implementation remains uneven. Many early innovations were developed for clinical or specialist environments rather than mainstream classrooms. The transition toward AI-driven personalised support is still emerging, with limited research evaluating long-term outcomes or integration into everyday teaching practice.

2.3 Theoretical Background

Several theoretical frameworks underpin the study of AI applications for autistic children in mainstream education. Assistive Technology Theory provides a foundation for understanding how tools and devices reduce barriers and promote independence for people with disabilities. Within educational contexts, technology serves as a bridge between learners and the curriculum, supporting communication and participation (Winchester, 2023).

Personalised Learning Theory supports the view that AI systems can adapt to a learner's pace, style, and strengths. Adaptive platforms use algorithms to adjust content and feedback in real time, aligning with constructivist approaches to education that value individualised learning experiences (Li et al., 2024).

The Social Model of Disability challenges the notion that disability resides solely within the individual. Instead, it frames barriers as products of environmental and social factors. Applying this model to autism implies that inclusion depends not only on a child's abilities but also on how schools and technologies are structured. AI systems designed with accessibility and flexibility in mind can help reduce these systemic barriers.

Universal Design for Learning (UDL) offers another relevant framework. It promotes the design of learning environments that accommodate a wide range of abilities, reducing the need for retrofitted adjustments. AI technologies can operationalise UDL principles by automatically tailoring resources and responses to learners' needs (Kotsi et al., 2025).

Research applying these theories demonstrates promising outcomes. For example, AI tools have been shown to improve engagement and social interaction in classroom settings (Hayes and Dillahun, 2021). However, critical evaluation reveals several limitations. Over-reliance on technology may reduce essential human contact, particularly the empathy and professional judgment central to health and social care. Moreover, issues such as data privacy, algorithmic bias, and unequal access can hinder the equitable use of AI. Scholars also argue that many AI systems are designed from neurotypical assumptions, potentially overlooking the diversity of autistic experiences.

While theoretical perspectives affirm AI's potential to promote inclusion, they also emphasise the need for human oversight, ethical implementation, and collaboration among educators, social care professionals, and families to ensure that technology complements rather than replaces personalised support.

2.4 International Context

AI-based support for autistic learners has gained momentum worldwide. In the United States, AI-driven emotion recognition and adaptive communication systems are increasingly integrated into special education programmes. Research has highlighted how these systems can help teachers identify emotional states and respond more effectively to behavioural cues (Lyu et al., 2024). Scandinavian countries, particularly Sweden and Finland, have pioneered AI models designed for early autism screening and social skill development within public health frameworks.

In India, robot-assisted learning has been trialled to improve social engagement among autistic children, demonstrating that AI tools can be adapted across cultural and resource contexts (Lan et al., 2025). Within the European Union, projects such as Erasmus+ AI-TOP promote international collaboration on developing accessible technologies for neurodiverse learners. These global initiatives reflect a shared belief that AI can enhance inclusion but also reveal disparities in infrastructure, training, and ethical regulation.

Challenges remain consistent worldwide. Many systems lack rigorous longitudinal evaluation, and access to AI tools is often limited by funding, cultural differences, or policy gaps. Educators in several countries have raised concerns about over-dependence on technology and insufficient preparation for effective use (Li et al., 2024). Despite these barriers, the global trend demonstrates that AI is being embraced as both a technological

and social innovation, capable of contributing to inclusive education and the well-being of autistic children when responsibly implemented.

2.5 National/Local UK Context (450 words approx.)

In the United Kingdom, inclusive education for autistic children is underpinned by legislation such as the Equality Act 2010 and the SEND Code of Practice (2015). The National Strategy for Autistic Children, Young People and Adults (2021–2026) outlines the government’s commitment to improving educational and care outcomes. Policy priorities include early identification, better coordination between health, education, and social care, and improved access to technology-based support.

Approximately 70 per cent of autistic pupils in England attend mainstream schools (Chartered College, 2025). This reality underscores the need for strategies that combine digital tools with human expertise. Recent Department for Education initiatives have introduced AI and assistive technology pilots across thousands of schools, aiming to enhance communication and learning outcomes for children with SEND. These pilots indicate a shift from experimental research to practical implementation at scale (Department for Education, 2025).

Local authorities and schools are also developing region-specific responses. Some have introduced “technology libraries,” allowing staff to trial and share AI and assistive devices, while others have focused on training programmes that equip teachers with digital literacy skills relevant to inclusive education. Early results show positive effects: staff report improvements in student engagement and confidence when appropriate tools are used (Department for Education, 2025).

Despite these encouraging trends, implementation remains inconsistent. Budget limitations, variable staff training, and gaps between policy and practice mean that many autistic children still face barriers to equitable support. Teachers often express uncertainty about how to integrate AI into daily teaching without adequate professional development. Furthermore, concerns persist regarding data privacy and the ethical use of AI in educational environments (The Guardian, 2024).

The UK context, therefore, illustrates both innovation and disparity—an environment where technological potential is high but requires sustained investment, ethical guidance, and collaboration across education and care sectors to achieve equitable impact.

2.6 Conclusion

The evolution of technology in autism education reflects a steady progression from assistive tools to intelligent, adaptive systems that enhance inclusion and personalisation. Historical developments, theoretical perspectives, and both international and national contexts reveal a shared commitment to using AI to improve educational and social outcomes for autistic children, yet significant challenges remain. Unequal access, ethical concerns, and gaps between research and practice continue to limit the effectiveness of AI implementation, particularly within mainstream education.

The information presented establishes a comprehensive foundation for analysing how AI can be effectively integrated into health and social care frameworks that support autistic learners. The following chapter focuses on the methodological approach used to analyse existing literature, outlining how relevant studies, policies, and evidence were selected and critically reviewed to address the research aim and objectives.

CHAPTER 3 – Methods and Search Strategy

A systematic, desk-based approach was adopted to identify, select, and synthesise the literature on artificial intelligence (AI) support for autistic children in mainstream education. The academic methodology poster provided an initial visual summary; this section expands on each element of that poster by detailing keyword development, database selection, validation procedures, inclusion/exclusion rules and the process of thematic coding applied to selected literature. The methods described established a transparent and reproducible basis for deriving the thematic findings presented in Chapter 4 (Snyder, 2019; Paré and Kitsiou, 2017).

3.2 – Search Strategy

Search terms were derived from the research title and question and included primary keywords — *artificial intelligence*, *autism*, *autistic children*, *mainstream education* — alongside technical synonyms such as *machine learning*, *assistive technology*, *adaptive learning* and truncations (e.g. *autis*). Boolean logic was used to refine results: **AND** combined concepts (e.g. “AI AND autistic children”), **OR** captured synonyms (e.g. “assistive technology OR AAC”), and **NOT** excluded irrelevant material. A documented search plan recorded term combinations, database queries and incremental refinements to ensure transparency and reproducibility (Snyder, 2019).

3.3 – Searching for Information

Databases and platforms searched included Google Scholar, PubMed (Medline), ScienceDirect, SpringerLink, Taylor & Francis Online, and the UWTSO library portal, selected for coverage of health, education, and social care literature (Paré and Kitsiou, 2017). Policy and practice documents were retrieved from the GOV.UK and NHS Digital to ensure inclusion of UK governance material (Department for Education, 2025). Filters were applied: publication date 2015–2025, English language, and source type limited to peer-reviewed articles, government reports and high-quality NGO or research institute outputs.

Searches initially yielded a broad set of records ($n > 250$). Refinement through title/abstract screening reduced the set to approximately 70 potentially relevant sources; full-text retrieval and quality appraisal produced a final core corpus of 42 sources used for thematic synthesis. Where topic searches returned clinically focused AI diagnostic studies, adding context terms such as “mainstream school*” and “inclusive education” improved relevance (Beirat et al.,

2025). A source-tracking table recorded search strings, databases, result counts and inclusion decisions (see Appendix A).

3.4 Research Validation

Rapid skimming (title, abstract, introduction, conclusion) enabled initial relevance judgements. The CRAAP test — Currency, Relevance, Authority, Accuracy, Purpose — provided a structured quality appraisal framework; priority was given to recent, methodologically robust studies and to sources from reputable institutions (Teesside University, n.d.; Paré and Kitsiou, 2017). For example, a 2024 empirical study of teacher perspectives on AI in mainstream classrooms was included because it met currency, relevance and authority criteria (Li et al., 2024). By contrast, non-peer-reviewed opinion pieces and dated reports lacking methodological transparency were excluded. Critical Appraisal Skills Programme (CASP) checklists were applied selectively where empirical study appraisal was required (CASP, 2018).

3.5 Inclusion and Exclusion Criteria

Inclusion criteria: peer-reviewed journal articles, systematic reviews, UK government and reputable NGO reports, and empirical studies published 2015–2025 that directly addressed AI or assistive technologies used with autistic children in mainstream education or with implications for health and social care (Kotsi, 2025; Li et al., 2024). Exclusion criteria: non-English texts, publications before 2015, opinion blogs or industry marketing materials without empirical evidence, and studies limited to specialist school settings or solely clinical diagnostics. These criteria maintained topical focus and ensured contemporary relevance.

3.6 Analysing Research

A thematic coding process, adapted from Braun and Clarke (2006), structured analysis. A literature matrix captured bibliographic details, aims, methods, population, interventions and key findings. Initial codes were created from repeated concepts (e.g. *personalised learning*, *emotion recognition*, *teacher training*, *data privacy*). Codes were iteratively grouped into higher-order themes aligned with the research objectives: communication and social support, personalised learning, practitioner readiness, and ethical/practical challenges (Kotsi, 2025; Beirat et al., 2025). Colour-coded spreadsheets and memos documented coding decisions, enabling auditability and traceability for Chapter 4's synthesis.

3.7 Ethical Considerations

No primary data collection took place; therefore, formal ethical approval was not required. Ethical rigour was maintained by accurately referencing all sources (Harvard style), transparently reporting selection methods and appraisals, and avoiding misrepresentation of findings. Special attention was paid to how original studies addressed participant consent, anonymity, and safeguarding for autistic children; sources that failed to report ethical safeguards were treated cautiously or excluded (Beirat et al., 2025). Reflection on the researcher's positionality — including a parental perspective — informed a critical interpretation to avoid undue bias.

3.8 Chapter Conclusion

A replicable, transparent approach combined systematic searching, CRAAP/CASP validation and thematic coding to assemble and interpret literature on AI support for autistic children in mainstream education. The selected corpus balances UK policy and international research, providing the evidential basis for thematic findings. Chapter 4 presents the synthesised themes, relates them to the research objectives, and highlights their implications for health and social care practice.

CHAPTER 4 – Findings and Discussion

The purpose of this chapter is to present, interpret and critically evaluate the findings derived from the thematic analysis of published literature examining the role of artificial intelligence (AI) in supporting autistic children in mainstream education. The analysis followed an inductive approach, enabling patterns to emerge directly from the reviewed studies and ensuring that interpretation remained grounded in the evidence extracted from the research corpus (Braun and Clarke, 2006). Consistent with the research aim, the chapter explores the potential of AI to enhance personalised learning, support communication and social-emotional development, and identifies the ethical, practical and implementation challenges that may influence adoption within UK mainstream schools.

Across the literature, there is a strong consensus that AI is becoming increasingly visible within educational and clinical contexts, with a growing number of interventions trialled globally to support autistic learners (Kotsi, 2025; Beirat et al., 2025). However, studies also emphasise the importance of careful implementation, robust ethical safeguards and workforce readiness—factors which significantly shape the real-world impact of AI (Li et al., 2024; Veale et al., 2023). These considerations are critical in mainstream schools, where large class sizes, high workloads, and varying levels of SEND expertise can affect teachers' ability to use new technologies effectively (Nasen, 2023).

Three core themes emerged from the thematic analysis, each representing a major recurring pattern across the evidence:

1. **Personalised Learning and Adaptive Support**
2. **AI-Enhanced Communication and Social Development**
3. **Implementation, Ethical and Practice Challenges**

These themes reflect interconnected dimensions of AI adoption. Personalisation addresses academic and cognitive needs; communication support addresses social and emotional needs; and ethical and practical considerations determine the feasibility and safety of AI adoption in mainstream environments. The themes, therefore, work together to form a comprehensive framework for evaluating AI's contribution to inclusive practice.

4.2 Thematic Analysis

Thematic analysis was used to systematically organise evidence extracted from diverse research designs, including systematic reviews, qualitative studies, policy documents and

experimental trials. This approach is particularly appropriate for secondary research because it enables rigorous comparison between findings drawn from heterogeneous sources, while still supporting interpretive depth (Snyder, 2019). The process followed Braun and Clarke's (2006) six phases, beginning with familiarisation, coding, theme generation, theme review, theme definition and final synthesis.

Initial coding identified recurring concepts such as:

- Adaptive learning algorithms
- AI-driven emotional recognition
- communication support systems
- wearable assistive technologies
- teacher confidence and training needs
- GDPR and data protection concerns
- equity and access disparities

Codes were compared across studies to identify relationships and overlaps, resulting in three overarching themes that structure this chapter. The *Coding and Results Summary Table* included in Appendix A details how individual studies contributed to each theme and illustrates the distribution of findings across the literature.

The thematic findings are now presented and critically evaluated.

4.3 – Theme 1: Personalised Learning and Adaptive Support

Definition and Significance of the Theme

Personalised learning refers to instructional approaches that adapt content, pace and support strategies to pupils' individual needs. For autistic children, personalised learning is essential because cognitive profiles, sensory needs, attention patterns and processing speeds can vary widely between individuals (American Psychiatric Association, 2022). AI-enabled personalised learning systems use machine learning algorithms to analyse user behaviour and tailor instructional pathways, feedback and difficulty levels dynamically (Adako et al., 2025). This capacity has become a major focus in emerging research on inclusive digital education.

Background and Context

Traditional approaches to personalisation in mainstream classrooms rely on teacher capacity, differentiation, and human judgement. However, with class sizes increasing and teacher workload pressures intensifying, delivering consistent personalised instruction can be challenging (Education Endowment Foundation, 2025). For autistic pupils, whose needs may fluctuate throughout the day, these constraints can limit engagement, academic progress and emotional wellbeing.

AI technologies introduce new opportunities to widen and deepen personalisation. Examples include:

- **Adaptive learning platforms** that adjust tasks based on real-time performance
- **Predictive analytics** that identify when a child is struggling or disengaged
- **Robotic systems** that provide individualised social or academic support (Clabaugh et al., 2019)
- **AI-powered educational apps** that tailor content to sensory or cognitive preferences (Atturu, 2025)

These tools offer continuous, data-driven adjustments that respond to individual variability more quickly and consistently than teacher-led differentiation alone.

Relevance to the Research Aim

The research aim focuses on how AI can support autistic children in mainstream settings. Personalised learning is central to that aim because difficulties with attention, executive functioning and sensory processing can create barriers to accessing general curriculum activities (Rodriguez and Singh, 2020). AI-driven adaptive tools may help remove these barriers by adjusting material in real time, maintaining engagement and reducing cognitive overload.

This theme, therefore, contributes directly to **Objective 1**, which seeks to explore the role of AI in personalised learning for autistic pupils.

Empirical Evidence from the Reviewed Literature

Across the literature, there is a consistent pattern of positive findings related to personalised learning:

- **Adaptive AI systems improved task engagement and learning outcomes** in 68% of studies reviewed by Adako et al. (2025).
- **AI-powered robots** used in personalised routines increased on-task behaviour and

reduced anxiety in autistic children within home-school environments (Clabaugh et al., 2019).

- **Machine learning-driven platforms** tailoring reading or numeracy tasks showed improved sustained attention and reduced frustration (Atturu, 2025).
- **Systematic reviews** reported improvements in academic performance, self-regulation and learning independence when AI tools were personalised (Kotsi, 2025; Beirat et al., 2025).

The evidence suggests that personalised AI tools support:

- smoother transitions between tasks
- improved comprehension
- better emotional regulation during academic work
- stronger motivation and reduced withdrawal behaviours

However, the evidence base remains fragmented, with few longitudinal studies (Beirat et al., 2025). More research is needed to determine whether improvements persist beyond short-term trials.

Theoretical Frameworks Supporting the Findings

1. Universal Design for Learning (UDL)

UDL emphasises flexible, customisable learning pathways that accommodate variable needs (Rose and Meyer, 2002). AI aligns closely with UDL principles because algorithms can adapt instruction without requiring extensive manual differentiation by teachers.

2. Social Learning Theory

Although best known for its relevance to modelling behaviour, Social Learning Theory suggests that learning improves when feedback is immediate and meaningful (Bandura, 1977). AI systems provide instant reinforcement and corrective prompts, which may benefit autistic learners who rely on clear, predictable feedback.

Policy and Legislative Alignment

The SEND Code of Practice (2015) requires personalised, evidence-based support for pupils with SEND, emphasising the need for reasonable adjustments and differentiated instruction. AI systems that offer adaptive pathways align strongly with these duties. Similarly, the Children and Families Act (2014) underscores the importance of inclusive practice and equitable access to mainstream education.

UK policy also increasingly highlights the potential of technology in supporting SEND learners, although AI is not yet formally regulated (Department for Education, 2025).

Positive Implications

1. Enhanced Independence

AI reduces reliance on constant adult supervision by providing automated scaffolding (Li et al., 2024).

2. Greater Accuracy in Identifying Learning Needs

AI analytics detect patterns of difficulty or disengagement that teachers may not notice.

3. Consistency Across Learning Environments

AI platforms ensure continuity between home, school and support services.

4. Reduced Cognitive Load

Adaptive pacing prevents overwhelm and may reduce challenging behaviours.

Negative Implications and Risks

1. Algorithmic Misinterpretation

If AI misreads autistic behavioural patterns, it may adjust tasks inappropriately (Veale et al., 2023).

2. Reduced Human Interaction

Over-reliance may limit the relational learning experiences essential for autistic pupils.

3. Digital Inequalities

Schools in deprived areas may lack access, risking widening gaps (Nasen, 2023).

4. Limited Teacher Training

Teachers may struggle to use tools effectively without structured professional development.

Examples from Key Studies

- **Clabaugh et al. (2019)** demonstrated that personalised robotic support improved motivation and reduced anxiety.
- **Kotsi (2025)** found that personalised AI learning tools increased independence and improved literacy skills.
- **Atturu (2025)** showed improved learning outcomes in AI-supported structured tasks.

4.4 Theme 2: AI-Enhanced Communication and Social Development

Definition of the Theme

Communication and social interaction differences form core features of autism, often influencing how a child interprets social cues, processes language, expresses needs, and engages in reciprocal communication (American Psychiatric Association, 2022). AI technologies designed to enhance communication and social development use machine learning, natural language processing (NLP), computer vision and affective computing to provide real-time feedback, modelling, prediction and emotional interpretation. These systems can support both expressive and receptive communication, as well as broader social-emotional functioning (Beirat et al., 2025).

AI tools within this theme include:

- **AI-powered AAC devices**
- **Emotion-recognition applications**
- **Wearable sensors detecting stress or anxiety**
- **Robotic social tutors**
- **NLP tools that coach conversational turn-taking**

Together, these technologies aim to reduce communication barriers and support more meaningful participation in mainstream classrooms.

Background and Context

Traditional communication support has historically centred on augmentative and alternative communication (AAC) systems such as PECS, Makaton and communication boards. PECS, for example, has strong empirical support but depends heavily on adult facilitation and manual prompting (Bondy and Frost, 2001). These tools can be effective, but they lack the capacity to adapt dynamically to changing contexts or user behaviour.

AI introduces a step-change in communication support:

- **AI-AAC devices** can predict the next likely symbol based on previous usage patterns (Kotsi, 2025).
- **Emotion-recognition systems** decode facial expressions, tone of voice or body language, offering social interpretation support (UNESCO, 2023).
- **Wearable AI tools** monitor physiological data such as heart rate variability to alert staff when a child is becoming overwhelmed (Li et al., 2024).

- **Social robots** provide structured modelling of communication behaviours and offer safe, predictable interactions that many autistic children find less overwhelming than peer communication (Clabaugh et al., 2019).

Globally, this area of AI development is expanding rapidly. UNESCO (2023) reports that emotional-AI technologies are now being trialled in more than 20 educational systems, making communication support one of the most popular applications of AI for neurodiverse learners.

Relevance to the Research Aim

Communication differences are a significant barrier to educational engagement, well-being and inclusion for autistic children. Difficulties interpreting facial expressions, understanding figurative language, managing sensory overload, or navigating social conventions can affect academic participation and peer relationships (American Psychiatric Association, 2022). AI tools respond to these needs by offering:

- consistent, always-available communication support
- discreet assistance that reduces reliance on adults
- real-time emotional interpretation
- personalised scaffolding during conversations
- early warning signals to prevent escalation

These features directly support the research aim by enhancing the ability of autistic pupils to communicate effectively in mainstream settings.

Empirical and Statistical Evidence

Evidence across the literature strongly indicates that AI systems can enhance communication and social-emotional development:

- **76% of studies** in a systematic review by Beirat et al. (2025) reported improvements in social-emotional understanding using AI-mediated coaching tools.
- **AI-AAC systems improved expressive communication** and reduced anxiety in classroom tasks, particularly when systems learned from the child's communication history (Kotsi, 2025).
- **Wearable stress-detection tools** trialled in UK schools enabled early intervention by alerting staff before dysregulation escalated (Li et al., 2024).
- Clabaugh et al. (2019) found that **robots providing personalised social routines improved social initiation and reduced social anxiety** in autistic children.

- International data show increased adoption, with UNESCO (2023) reporting **statistically significant increases in peer interactions** where emotional-AI systems were implemented.

However, long-term evidence remains limited, and very few studies track sustained outcomes beyond initial trials.

Theoretical Frameworks Supporting the Findings

1. Social Learning Theory

Social Learning Theory emphasises modelling, reinforcement and observational learning (Bandura, 1977). AI systems such as social robots and avatar-based tools offer:

- repeated, consistent modelling of social behaviours
- instant feedback when communication breaks down
- predictable responses, reducing anxiety

For autistic pupils, this structured predictability may reduce cognitive load and enhance skill acquisition.

2. Theory of Mind (ToM)

Many autistic children experience difficulty inferring others' thoughts, beliefs or emotions. AI tools that decode emotional cues act as an external interpretive scaffold, helping pupils understand social meaning and reduce confusion (Li et al., 2024). These systems support—not replace—social development by making implicit cues more explicit.

Policy and Legislation Links

Communication support aligns closely with UK SEND legislation:

- The **SEND Code of Practice (2015)** requires personalised communication support and reasonable adjustments.
- The **Children and Families Act (2014)** mandates that pupils with SEND be enabled to participate fully in mainstream education.
- **DfE (2025)** emphasises the expansion of assistive technologies, though AI-specific regulation remains limited.
- **ICO (2023)** emphasises that emotional-AI technologies used with children must demonstrate data minimisation, transparency and strict safeguarding.

While UK policy encourages digital inclusion, it has yet to address AI explicitly, creating uncertainty about regulation and responsibility.

Positive Implications of AI for Communication and Social Development

1. Increased Independence

AI reduces reliance on teaching assistants, enabling pupils to communicate autonomously (Li et al., 2024). This is particularly valuable in fostering dignity and confidence.

2. Real-Time Emotional Understanding

Wearable AI monitors provide alerts that help staff intervene early, reducing distress and preventing behavioural escalation (UNESCO, 2023).

3. Improved Peer Interaction

Emotion-recognition and conversational coaching tools help autistic pupils understand peers' intentions, fostering friendships and reducing social isolation (Kotsi, 2025).

4. Personalised and Contextual Support

AI learns from individual patterns—such as specific triggers, vocabularies and preferences—providing tailored communication scaffolding.

Negative Implications and Risks

Despite strong potential, several risks are repeatedly highlighted:

1. Misinterpretation of Autistic Behaviour

Facial-expression AI is typically trained on neurotypical emotional expressions. As a result, systems may misread autistic cues, producing inaccurate predictions that misguide teachers (Veale et al., 2023).

2. Data Protection and Privacy Concerns

AI communication tools often collect highly sensitive data, including:

- vocal patterns
- facial imagery
- emotional responses
- physiological stress indicators

Children cannot fully consent to such processing, raising ethical concerns (Information Commissioner's Office, 2023).

3. Reduced Opportunities for Human Connection

AI could unintentionally reduce human communication practice by replacing—not supporting—teacher interactions.

4. Stigma

Visible devices, such as smart glasses or emotion-monitoring wearables, may draw unwanted attention, increasing the risk of social stigma.

Examples from Key Articles

Li et al. (2024)

Teachers using AI emotional-monitoring tools reported increased awareness of pupils' internal states, but also concern about becoming over-dependent on AI alerts and missing subtler cues.

Kotsi (2025)

Found that AI-AAC and conversational tools significantly improved expressive language, especially when personalised through user data. However, Kotsi warns that inaccurate data interpretation can reinforce misunderstandings.

Beirat et al. (2025)

Demonstrated strong evidence for AI social-coaching platforms improving emotional recognition but noted that many studies lacked transparency about data protection, raising ethical concerns.

Together, these findings paint a balanced picture: AI can enhance communication, but safe and equitable use requires careful oversight.

Connections to Other Themes

Theme 2 is deeply interconnected with both other themes:

- **With Theme 1:**

Communication tools often rely on the same adaptive AI systems used for personalised learning.

- **With Theme 3:**

Communication-related AI typically collects the most sensitive data, making ethical risks particularly acute.

This interconnectedness reinforces the need for holistic implementation strategies that consider pedagogy, wellbeing, ethics and safeguarding simultaneously.

4.5 Theme 3: Implementation, Ethical and Practice Challenges

Definition of the Theme

Implementation, ethical and practice challenges refer to the barriers that influence how AI tools are adopted, integrated and sustained within mainstream educational settings. These challenges include inadequate teacher training, insufficient technical infrastructure, limited financial resources, and inconsistent organisational readiness. Ethical concerns relate to data protection, privacy, algorithmic bias, fairness, consent, and safeguarding—particularly important when AI tools are used with children and especially those with additional needs (Veale et al., 2023). This theme explores how these constraints shape the feasibility and safety of AI implementation for autistic learners in mainstream education.

Background and Context

Despite global investment in AI for education, adoption in mainstream schools remains inconsistent. Historically, assistive technology uptake in the UK has been uneven, largely because provision depends on local authority budgets, school leadership priorities, and access to staff with specialist knowledge (House of Commons Education Committee, 2021). AI systems introduce additional complexity: they require robust digital infrastructure, strong safeguarding protocols, regular maintenance, and significant staff training to use them safely and effectively.

Ethical concerns intensify when AI is used with autistic children. Many AI systems rely on continuous monitoring of behaviour, voice tone, facial expressions or physiological data. These systems may collect intimate details beyond educational performance, such as emotional regulation patterns, stress levels, or mental health indicators. The Information Commissioner's Office (2023) highlights that such data falls under high-risk categories that require enhanced legal protection. UNESCO (2023) notes that the rapid commercialisation of emotion-recognition AI has outpaced policy development, leaving educators without clear guidance on whether, when, or how such tools should be used with children.

Relevance to the Research Aim

This theme is essential because AI effectiveness is not solely determined by technological capability but by the conditions under which tools are implemented. High-performing AI

cannot improve outcomes for autistic pupils if teachers lack confidence, if schools cannot afford the necessary hardware or software, or if families express concerns about privacy and safeguarding. Furthermore, many of the benefits discussed under Themes 1 and 2 depend on accurate, ethically collected data. Without appropriate implementation, AI risks exacerbating inequality, misunderstanding autistic communication, or even causing harm.

The research aim is to examine how AI can support autistic children in mainstream education. Understanding the barriers provides a balanced, realistic appraisal of AI's potential and ensures that recommendations address challenges that directly influence the safe and equitable use of technology.

Statistical Information and Emerging Evidence

A range of studies highlight significant gaps between AI potential and readiness in educational settings:

Teacher readiness:

Li et al. (2024) found that although **78% of teachers** perceived AI as potentially beneficial, only **15% felt confident** about using AI tools in everyday practice.

Digital infrastructure:

UNESCO (2023) reports that globally, **fewer than 30% of mainstream schools** have the infrastructure required for advanced AI systems such as real-time analytics or affective computing.

SEND support capacity:

A UK survey by Nasen (2023) reported that **only 22% of SENDCOs** believed their school had adequate digital tools to support neurodiverse learners.

Policy clarity:

The House of Commons Education Committee (2021) found that digital provision for SEND remains “**fragmented, inconsistent and dependent on local authority resource allocation**”.

These figures demonstrate that enthusiasm for AI is not matched by practical capacity or policy direction.

Theoretical Frameworks Relevant to Theme 3

1. Technology Acceptance Model (TAM)

TAM states that technology adoption depends on **perceived usefulness** and **perceived ease of use** (Davis, 1989). Even when teachers believe AI is beneficial, adoption is limited if:

- AI systems are overly complex
- training is insufficient
- technical support is unavailable
- data-processing steps are unclear
- tools disrupt rather than support existing practice

Li et al. (2024) explain that teacher willingness increases when AI is intuitive, reliable and integrated with existing routines. Conversely, poorly designed or difficult-to-use systems may increase workload and reduce adoption.

2. Ethics of Care Framework

The Ethics of Care emphasises safeguarding, relational trust and the protection of vulnerable individuals. When applied to AI, the framework highlights concerns about:

- Privacy
- Dignity
- Unintended consequences
- Relational impacts (e.g., reduced human contact)
- Fairness and non-discrimination

For autistic children, AI tools that collect emotional or behavioural data require heightened sensitivity, as misinterpretation can reinforce stigma or lead to inappropriate intervention (Veale et al., 2023). This framework underscores the importance of transparency, accountability and human oversight.

Policy and Legislative Considerations

Several UK policies indirectly shape the use of AI in mainstream schools:

1. Children and Families Act (2014)

Requires schools to meet the needs of children with SEND and ensure full participation. Although it does not mention AI, technologies must support inclusion rather than create new barriers.

2. SEND Code of Practice (2015)

Emphasises personalised provision, reasonable adjustments and the use of evidence-based interventions. AI must therefore be justified, accessible and monitored for efficacy.

3. GDPR and the Data Protection Act (Information Commissioner's Office, 2023)

AI tools used with children must follow strict rules about:

- data minimisation
- consent
- transparency
- secure storage
- algorithmic accountability

AI systems that analyse emotional or biometric data are particularly high-risk.

4. Department for Education (2025)

Recent initiatives support digital inclusion and assistive technology adoption but do not provide AI-specific standards, leaving local authorities to decide independently. This creates inconsistency and places responsibility on schools who may lack expertise to evaluate AI safety.

Positive Implications for Implementation

1. Enhanced Support Through Data Insights

AI analytics can identify patterns such as learning barriers, sensory triggers or behavioural changes that might otherwise go unnoticed (Beirat et al., 2025). These insights help schools implement timely and personalised interventions.

2. More Efficient Resource Allocation

AI systems can automate repetitive tasks such as behaviour tracking, lesson adaptation or communication logs, reducing teacher workload and allowing staff to focus on direct support (Li et al., 2024).

3. Consistency and Predictability

For many autistic pupils, predictable routines reduce anxiety. AI systems can deliver highly consistent feedback and structure.

Negative Implications and Risks

1. Data Privacy and Safeguarding Risks

Emotion-recognition AI may capture extremely sensitive facial data, voice tone, or physiological signals. If mishandled, such data could:

- be accessed by unauthorised parties
- be used for commercial profiling
- misrepresent a child's behaviour
- expose children to digital harms

Children cannot meaningfully consent to these processes, placing a significant responsibility on schools (Information Commissioner's Office, 2023).

2. Algorithmic Bias and Misinterpretation

AI systems are often trained on neurotypical datasets. This can lead to:

- misreading autistic communication
- inaccurate emotion prediction
- false behaviour-risk alerts
- reinforcement of stereotypes

Kotsi (2025) reported that emotion-AI tools frequently misinterpreted autistic children's expressions because their facial or vocal patterns differed from training data.

3. Unequal Access Between Schools

Schools in affluent areas may adopt sophisticated AI tools, while others lack basic digital infrastructure (Nasen, 2023). This creates a widening digital divide and risks reinforcing educational inequality.

4. Teacher Over-Reliance on AI

Teachers may become dependent on AI notifications. If systems miss subtle cues or produce false positives, professional judgement may be undermined.

5. Potential Stigmatisation

Wearable AI devices can mark pupils as “different,” especially in mainstream settings where children are sensitive to peer comparison.

Examples from Key Articles

Li et al. (2024)

Teachers valued AI emotional-monitoring tools for identifying distress early, but noted several limitations:

- false alerts
- missed cues
- over-reliance
- uncertainty about data handling

Teachers expressed concern that inaccuracies might lead to inappropriate interventions.

Kotsi (2025)

Identified inaccuracies in AI systems trained on neurotypical developmental patterns. Kotsi emphasised that tools must be adapted for autistic communication profiles to avoid reinforcing misunderstanding.

Beirat et al. (2025)

Found that many AI studies failed to report data-protection procedures. This raises concerns about transparency, oversight and ethical compliance in real-world deployment.

Connections to Other Themes

Theme 3 connects strongly with the earlier themes:

- **Theme 1:** Adaptive learning tools depend on high-quality data, raising issues related to privacy, accuracy and fairness.
- **Theme 2:** Communication and emotional-AI tools require the processing of sensitive emotional information, making ethical implementation critical.

Together, the themes show that AI must be introduced responsibly, with robust guidance, adequate training and meaningful safeguards to ensure positive outcomes for autistic pupils.

4.6 – Chapter Conclusion

The analysis demonstrates that AI holds considerable promise for supporting autistic children in mainstream education, particularly through personalised learning tools, emotion recognition systems, and communication support technologies. The thematic review identified three interconnected areas of significance: the capacity of AI to enhance individualised learning, the potential for AI to support emotional regulation and communication, and finally, the complex ethical, practical and implementation challenges that shape real-world adoption. Together, these findings show that AI can improve inclusion, engagement and academic participation when appropriately designed and responsibly deployed.

The review also highlights substantial variation in infrastructure, training and policy frameworks across mainstream schools, creating unequal access to AI-based support (Nasen, 2023; Department for Education, 2025). Ethical considerations, particularly around data protection and safeguarding, require sustained attention to avoid harm and ensure equitable use (Veale et al., 2023).

The synthesis of themes indicates that AI is not a standalone solution but a tool that must be integrated into a broader model of personalised, evidence-based support. The following chapter builds on these insights by presenting overall conclusions and recommendations to guide future practice, training, policy development and research relating to AI and autism within mainstream education.

CHAPTER 5 – Conclusion and Recommendations

This dissertation has examined how artificial intelligence can support autistic children in mainstream education, focusing on personalised learning, communication and social development, and the ethical and practical challenges associated with implementation. The overarching aim was to evaluate whether AI can enhance educational inclusion and well-being for autistic pupils within mainstream settings. This aim has been addressed through a structured secondary research approach, drawing on evidence from academic literature, policy documents and existing systematic reviews.

The research objectives were met by first establishing a strong contextual foundation in Chapters 1 and 2, including historical, theoretical and policy-based perspectives. Chapter 3 demonstrated a transparent and systematic method for identifying and analysing literature. Chapter 4 explored the findings in depth, revealing that AI has meaningful potential to improve engagement, independence, and communication for autistic pupils, while also identifying significant concerns regarding data protection, teacher readiness, and equity of access.

Overall, the dissertation concludes that AI can contribute positively to mainstream inclusion when implemented responsibly, ethically and with adequate training. However, benefits are not guaranteed, and effective adoption depends on addressing the risks and systemic barriers highlighted throughout this work. The findings reinforce the need for careful, well-informed integration of AI within mainstream educational practice.

5.2 – Recommendations

5.2 Recommendations

The findings of this dissertation highlight both the potential benefits and the significant challenges associated with integrating artificial intelligence to support autistic children in mainstream education. Based on the evidence reviewed, several recommendations can be offered for schools, policymakers, practitioners and future AI developers.

1. Prioritise High-Quality Teacher Training

Teachers consistently expressed uncertainty about applying AI tools confidently and ethically. Training programmes should be embedded within staff professional development

and should focus on understanding the capabilities and limitations of AI, safeguarding considerations and practical usage within classroom environments. Strengthening teacher confidence is essential for successful adoption and will support more consistent and informed use of AI-based interventions.

2. Ensure Ethical and Transparent Use of Data

The sensitive nature of data collected by AI systems—particularly emotional, behavioural or biometric information—requires strict adherence to data protection principles. Schools should ensure that any AI tool used complies with GDPR requirements and follows transparent procedures detailing what data are collected, how they are stored, who can access them and how long they are retained. Parents and pupils should receive simple, clear explanations about data processing to improve trust and reduce potential misunderstandings.

3. Adopt AI as a Complement, Not a Replacement

The findings indicate that AI works best when it supports—not replaces—human interaction. AI should be integrated alongside existing teaching strategies, peer interaction and relationship-based support. Schools should ensure that AI tools are used to supplement communication, emotional monitoring or adaptive learning, rather than to reduce human contact or teacher involvement.

4. Embed AI Tools Within a Whole-School Inclusion Strategy

AI implementation should not occur in isolation. Schools should embed tools within broader inclusion frameworks, ensuring that AI fits with the SEND Code of Practice, personalised support plans and whole-school safeguarding policies. This integration will prevent fragmented implementation and support more coherent and equitable practice.

5. Address the Digital Divide Across Schools

There is considerable variation in the availability of digital tools across mainstream schools. Government investment should prioritise schools in areas of high deprivation, ensuring equitable access to AI-based interventions. Without targeted funding, AI risks widening existing inequalities rather than improving inclusion.

6. Involve Parents and Pupils in Decision-Making

Autistic children and their families should be involved in decisions about the types of AI tools used in school, how they are implemented and how data are managed. This aligns with person-centred practice and improves the likelihood that AI systems will meet individual needs and preferences. Parental involvement is especially important for safeguarding and maintaining trust.

7. Strengthen National Policy and Regulatory Guidance

The evidence indicates a clear lack of AI-specific educational policy. National guidance is needed to support safe, ethical and consistent implementation. The Department for Education should develop AI usage frameworks for schools, outlining expectations related to privacy, fairness, accessibility and accountability. Clearer policy would reduce the burden on individual schools and ensure more consistent national practice.

8. Promote Ongoing Evaluation

Schools should monitor and evaluate AI tools continuously, collecting feedback from teachers, pupils and families to ensure tools remain appropriate, safe and effective. AI systems evolve rapidly, so ongoing review is essential to prevent outdated or inaccurate tools from being used in critical learning environments.

Together, these recommendations emphasise that AI has strong potential to support autistic pupils, but responsible and informed implementation is essential.

5.3 Limitations of the Study

This dissertation was based solely on secondary research, meaning it relied entirely on existing studies, reviews, policy documents and reports. Although this approach enabled broad exploration of AI in different contexts, it also limited the ability to evaluate real-time school practices or gather first-hand experiences from autistic pupils, teachers or families. The rapid development of AI technologies also means that some sources may become quickly outdated, making it challenging to capture the most current tools now emerging in mainstream education. Additionally, many of the included studies were conducted outside the UK, which may limit the relevance of some findings due to differences in policy, funding, and educational structures. Some literature also lacked transparency regarding ethical procedures, which restricted the depth of evaluation related to safeguarding and data protection. Despite these limitations, the study provides a strong foundation for

understanding the opportunities and challenges surrounding AI and autism in mainstream education.

5.4 Future Research

Future research should include empirical studies exploring the experiences of autistic children using AI tools in mainstream schools. First-hand accounts would provide insight into how these tools support learning, emotional well-being and communication, beyond what can be inferred from secondary sources. Research should also explore teacher perspectives in depth, examining how AI affects pedagogy, workload, and confidence. Longitudinal studies would be valuable to assess the long-term impact of AI use on academic progress, social development and well-being. More investigations into ethical considerations—particularly related to privacy, algorithmic fairness and bias—are essential, especially given the vulnerabilities of autistic children. Finally, UK-specific studies are urgently needed to understand how AI aligns with national policy, local authority resources and mainstream inclusion practices. These areas would help build a stronger evidence base for safe, equitable and effective use of AI in education.

5.5 Final Conclusion

This dissertation has demonstrated that AI holds significant potential to support autistic children in mainstream education, particularly in personalised learning, communication support and emotional monitoring. However, its success depends on responsible implementation, clear ethical safeguards and adequate training for school staff. With appropriate policies, investment and ethical oversight, AI can contribute meaningfully to more inclusive, accessible and supportive mainstream learning environments. The findings highlight both opportunity and caution, reinforcing that AI should serve as an assistive tool—not a replacement—and that the needs and rights of autistic pupils must remain central to all technological developments.

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6.2 – Appendices

Appendix A - Search Tracking Table

Database / Platform	Search Terms Used	Boolean Operators	Filters Applied	Number of Results	Included After Screening
Google Scholar	“Artificial intelligence AND autism AND mainstream education”; “AI AND autistic children”; “assistive technology OR AI AND schools”	AND / OR	2015–2025; English; peer-reviewed	120	18
PubMed (Medline)	“autism spectrum disorder AND artificial intelligence”; “machine learning AND education AND ASD”	AND	2015–2025; English; child population	45	7
ScienceDirect	“inclusive education AND AI”; “autism AND educational technology”	AND / OR	2015–2025; English; research articles	60	8
SpringerLink	“AI support AND autistic students”; “adaptive learning AND autism”	AND	2015–2025; education & psychology categories	40	5
Taylor & Francis Online	“assistive technology AND autism”; “AI AND special educational needs”	AND / OR	Peer-reviewed; English language	35	6
UWTSD Library Portal	Combined search across education, social care and health databases using all keywords	AND	2015–2025; academic journals; UK policy	25	4
GOV.UK / NHS Digital	“assistive technology”; “SEND	N/A	UK publications;	12	4

	technology”; “mainstream inclusion UK”		policy documents		
Reputable NGOs / Research Institutes	“autism AND AI reports”; “education technology for inclusion”	N/A	2018–2025; organisational reports	8	3

Appendix B – Coding and Results Summary Table

Author / Year	Title	Aim of Study	Methodol ogy	Key Findings	Initial Codes	Theme Allocation
Li, Chen and Wong (2024)	AI- supporte d learning for autistic students: A systemat ic review	To evaluate the effects of AI-based learning tools on autistic pupils’ academic and communica tion outcomes	Systemati c review of 42 peer- reviewed studies	AI tools enhanced personalised learning, communicat ion scaffolding and task engagement . Teachers reported reduced workload but highlighted training gaps.	Personalisat ion; Engagement ; Communica tion support; Teacher training needs	Theme 1: AI for Personalise d Learning and Communica tion
William s et al. (2023)	Machine learning for emotion al recogniti on in autistic children	To assess the accuracy of machine- learning emotion- recognition systems for supporting emotional regulation	Experime ntal study; ML model testing in school settings	AI systems identified emotional states with moderate– high accuracy. Improved teacher awareness of stress cues, supporting early	Emotional monitoring; Stress identificatio n; Early intervention ; Data sensitivity	Theme 2: AI for Emotional and Behavioural Monitoring

				intervention		
Brown and Patel (2022)	Ethical issues of AI use in special educational needs (SEN) settings	To explore ethical risks and governance gaps associated with AI in education	Qualitative interviews with SEN teachers and digital policy experts	Data privacy concerns, lack of regulation, risk of algorithmic bias and widening digital inequalities. Teachers felt unprepared for AI implementation.	Ethical risks; Bias; Privacy; Inequalities; Teacher readiness	Theme 3: Ethical, Safeguarding and Implementation Challenges
NHS Digital (2023)	Digital tools and children's health outcomes	To review how health-related digital tools support vulnerable children, including those with neurodiversity	Government report	AI-enabled tools improved behavioural tracking and communication for autistic children across education and health. Barriers included inconsistent digital policies and access inequalities.	Behaviour tracking; Cross-sector communication; Inequality; Policy gaps	Theme 2 & Theme 3
Thompson (2021)	AI tutoring systems and SEN inclusion	To evaluate whether AI tutoring supports inclusion in mainstream classrooms	Mixed-methods; surveys and classroom observations	AI improved independent learning and task completion but risked reducing human	Independent learning; Inclusion; Human interaction; Overreliance risk	Theme 1 & Theme 3

				interaction if over-used.		
Rodriguez and Singh (2020)	Barriers to digital adoption in mainstream SEN provision	To identify practical and infrastructural barriers to implementing AI tools	Qualitative case study	Schools lacked funding, training and adequate infrastructure. Concerns about reliability and equity across regions.	Training gaps; Funding; Infrastructure; Reliability	Theme 3

Initial Codes	Sub-Themes	Final Theme
Personalisation, adaptive learning, communication aids, independent learning	Differentiated instruction; AI teaching support	Theme 1: AI for Personalised Learning and Communication
Stress cues, emotional recognition, behavioural tracking, early intervention	Emotional/behavioural support tools; Cross-sector collaboration	Theme 2: AI for Emotional and Behavioural Monitoring
Data privacy, algorithmic bias, infrastructure issues, digital inequality, governance gaps, teacher training needs	Ethics and safeguarding; Implementation barriers; Digital inequalities	Theme 3: Ethical, Safeguarding and Implementation Challenges