

To study the effectiveness of educational interventions and approaches for improving academic outcomes in young Autistic children.

Abstract

This research project aims to investigate the effectiveness of educational interventions and approaches in improving academic outcomes among young children diagnosed with Autism Spectrum Disorder (ASD). The rationale behind conducting this research is to identify all effective interventions so that teachers, therapists and parents can tailor educational strategies to support autistic children to ensure each child has the best opportunities. These interventions and approaches include Applied Behaviour Analysis (ABA), one-to-one assistants and TEACCH programme.

The study will include mixed research methods, combining quantitative and qualitative data collection techniques. The sample size will consist of 60 young autistic children aged 4 to 7 years old, selected through mainstream educational settings and specialist educational settings in South Wales.

Consent will be obtained from parents or legal guardians before their child's participation. Quantitative data will be collected through assessments made before the intervention and then again after the intervention. Standard assessments of academic achievement will be used in order to determine how different interventions and approaches affect academic outcomes. Qualitative data will be obtained through semi-structured interviews and observation. The interviews will be conducted with all consented participants, parents, educators and therapists. Additionally, observations will be made in the settings where the invention or approach is clearly being displayed.

Within this research project, several ethical considerations will be noted and prioritized to ensure the well-being of each participant. These ethical considerations are drawn from the UNCRC rights of the child and include informed consent, confidentiality and privacy (Article 8, 16), protection from physical or psychological harm (Articles 6, 19, 32, 36, 37) and protection from discrimination (Article 2), (Unicef, No date).

Literature review

1 in 100 children has autism (World Health Organization, 2023) and more than 800 children in Wales have been waiting several years for an autism diagnosis (NationCymru, 2022). Consequently, every setting will have autistic pupils and it is significant that those pupils have equal opportunities and educational support. Ultimately, practitioners should increase their knowledge and understanding of autism to be able to give full support to each child (Wall, 2006, pg. 8).

Autistic children often exhibit impairments in social interaction, communication and sensory processing (NHS, 2022). This may inevitably impact their academic performance, particularly in a busy mainstream setting where engaging may be especially difficult. Even small changes in mainstream schools such as substitute teachers, school trips and school fayres can cause distress for ASD children (Manikiza, 2020). Due to this, it is necessary that autistic children have individualized approaches to support their education. This is because every autistic child may present different characteristics (Wall, 2006, pg. 8). By conducting research on the effectiveness of these interventions and approaches, educators can optimize every child's individual academic outcomes.

Several interventions within education have been implemented to support this.

Applied Behaviour Analysis is one approach that is used worldwide for autism treatment. It involves intensive interaction and positive reinforcement (Plimley, Bowen and Morgan, 2007, pg. 63). The effectiveness of this approach is heavily debated. Some of the largest autism organizations and charities recommend ABA (Kirkham, 2017). Additionally, a research project was conducted to discover parents experiences of ABA based interventions for their autistic children. The findings showed that the majority of parents who have access to ABA for their children had positive feedback and claimed that this invention was very effective (McPhilemy and Dillenburger, 2013, p. 157).

Alternatively, A study conducted by Rodgers et al (2020) concluded that some of the individual studies showed no benefits of ABA based interventions compared to other interventions such as TAU. It was also concluded that multiple factors need to be explored when considering individual differences in outcomes.

Similarly, a study conducted by Yu et al (2020) analyzing ABA showed that ABA did not have any significant differences in the participants ability to socialize or communicate. The effectiveness of ABA for treating autistic children may be questioned as socialization and communication are two of the main impairments found in autistic children.

Similarly, One-to-one assistants may be criticized for their effectiveness in supporting ASD children in settings. The findings of a study published by Azad et al (2015) indicated that one-to-one assistants were only engaged with their pupils slightly over half their time in the classroom. It goes on to state that there may be multiple reasons for their low engagement such as poor training. Symes (2012) states that staff training is crucial for meeting the needs of ASD children.

Additionally, Lushin et al (2020) concludes that teachers may pay less attention to ASD children as they assume that the one-to-one's are providing enough support. It is also suggested that having a one-to-one is not effective due to ASD children experiencing more pressure to perform tasks due to being one-to-one. This may lead to more challenging behavior.

Alternatively, a study published by Taman et al (2019) showed that out of two participant groups, one of them demonstrated prominent improvement with basic skills. However, the second group of participants revealed unapparent improvement.

All read studies published regarding the effectiveness of one-to-ones revealed mostly negative results. Within this research project, the effectiveness of one-to-ones will be studied to gain further insight on why they are ineffective and discussions will be made in order to establish what change needs to happen.

As per Article 23 of the Un Convention on the rights of the child, governments must do all they can to support disabled children (Unicef, No date) and so staff should be fully equipped to give autistic children the best support possible.

Furthermore, another approach for improving academic outcomes in young children is TEACCH.

TEACCH-based interventions were developed to support autism through routine and structure in their lives. The programme begins at childhood and continues through to adulthood. Its aim is to help children make sense of the world around them. Through TEACCH children should be able to function independently and become effective learners (Wall, 2006).

Sanz-Cervera et al (2018) conducted a study that analyzed the effectiveness of the TEACCH intervention through 14 studies. Out of the 14 studies, 11 of them showed huge improvement on the child's development. The remaining 3 studies revealed little to no significant improvement.

A study by Park and Kim (2018) supports this and states that the study demonstrated that TEACCH was effective for the 3 participants involved.

Moreover, a study conducted by Boyd et al. (2014) found that children who were involved in TEACCH experienced reduced autism characteristics over time.

Conversely, the Welsh Government (2014) stated that findings suggest children in TEACCH intervention showed greater improvement in autism severity.

Methological considerations

When studying the effectiveness of educational interventions and approaches for improving academic outcomes for young children, the chosen sample size will be 60 young autistic children from both mainstream schools and special settings in South Wales. According to Martinez-Mesa et al (2014), effectively choosing the sample size is an essential step during research proposals and studies. Choosing the wrong sample size for the study may impact the findings of the study. Farber and Fonseca (2014) supports this and states that the sample size directly influences the findings of the research. Purposeful sampling will also be used. This refers to a group of non-probability sampling techniques. Participants will be selected because they have the right characteristics for the study; thus improving the reliability of the study (Nikolopoulou, 2022). Using purposeful sampling also helps save time and costs as stated by Regoli (2019). On the other hand Regoli (2019) goes on to state that there are some disadvantages of using purposive sampling. It is argued that the process is extremely prone to researcher bias as the sample relies on the judgment of the researcher.

The chosen sample size of 60 autistic children aged 4-7 was decided due to the average age of autism diagnosis being 4 years old, as stated by Brett et al (2016).

It is also noted that most educational interventions start early. According to Child Autism Uk (No date) the earlier an autistic child receives interventions the better.

Another reason for the chosen sample age is because children who are diagnosed with autism later have higher levels of difficulties and an increased amount of problems, as stated by Mandy et al. (2022).

Moreover, the reason for choosing both mainstream schools and special schools are to thoroughly study the effectiveness of interventions as a whole. According to the National Autistic

Society (2020) a mainstream school may not meet the child's needs compared to a specialist school. This is supported by Healis Autism Centre (2022) as they state that mainstream schools only cater to children with mild special educational needs. A specialist school has teachers who are trained and have a deeper understanding of autism. However, some autistic children may not have the opportunity to attend a specialist school and so it is crucial for mainstream schools to use the most effective interventions for supporting their autistic pupils.

The study will also include mixed research methods of qualitative and quantitative data. The combination of methods is called triangulation (Noble and Heale, 2019). According to Hussein (2009) some authors argue that triangulation increases study accuracy. Bans-Akutey et al (2021) also supports triangulation and states that it provides deeper insights that help the researcher explain a phenomenon.

According to the UK Data Service (No date) qualitative data is non-numeric information. This includes obtaining information through methods such as interviews, observations or open-ended questionnaires. Within this research study, interviews and observations will be conducted in order to effectively conclude the effectiveness of each intervention. Semi-structured interviews will be conducted with parents, educators, pupils and therapists. Through these interviews, all participants will have an opportunity to discuss their experiences and opinions of each intervention. The decision to use semi structured interviews was influenced by Dejonckheere and Vaugh (2018) who stated that semi structured interviews are an effective way to collect open-ended data. Another Strength of semi-structured interviews is that the researcher can read non-verbal responses such as body language and silence to reveal hidden information (Kakilla, 2021). Questions can also be tailored based on the participants personal experiences. This is why questionnaires will not be used in this study. Questionnaires will also not be used as it has many limitations. This includes dishonest answers, unanswered questions and differences in understanding and interpretation (Debois, 2022).

According to Alshequeeti (2014) interviews have many limitations including the potential for subconscious bias and that it can be time-consuming. Alshequeeti (2014) goes on to state that using observations as an alternative allows researchers to fully investigate participants' external behavior which is why both interviews and observations will be conducted.

The Observations will be made pre, post and during interventions to establish any change in behaviors. The study will include individual observations as each child has different abilities. Observations provide adults with reliable information (Early years Matters, No date). This is because observations take place in natural settings. Observations also ensure that there is no participant bias. This is called the Hawthorne effect and is usually displayed when participants are aware that they are being studied and change their behavior as a result (McCambridge et al, 2014). According to Prasanna (2023), The most straightforward approach to gathering data is through observation. It demands minimal technical expertise, and although scientific observations may require some technical skills, it remains more accessible and simpler compared to other methods. Observation is easier because everyone engages in everyday observations as part of their lives. With minimal training, individuals can become proficient in observing their surroundings. Despite these advantages observational methods have limitations. With it being in a natural setting, researchers have little control of the environment and so researchers may not get full insights (Communications for research, No date). It is also deemed as a costly method due to the need for travel (Atema, 2022).

Furthermore, The use of quantitative data will be obtained through assessments. According to USC Libraries (2023) quantitative data focuses on numeric detailed data. Using quantitative data within research has advantages. USC Libraries (2023) goes on to state that quantitative data allows researchers to use a greater number of participants which will increase the reliability of the research. It also allows researchers to replicate their research.

However, quantitative research also has its limitations. According to Rahman (2016), quantitative data fails to provide deeper underlying meanings and explanations. This is supported by Mander (2022) as he states that you get a less detailed picture due to the numerical responses. They also state that due to there being pre set answers in quantitative methods, the answers may not include how the participant actually feels.

Within this research study, standard academic assessments will be used to determine whether the interventions and approaches improve the academia of the autistic children. The use of formative assessments allows for progress to be checked (Hassan, No date).

It should also be noted that as the participants are ASD, assessments may be difficult to obtain. Children with ASD may have academic challenges. As well as this, they may find it hard to focus on information (Cerny, 2022) and so completing an academic assessment may be difficult for them. Another quantitative research type can be telephone interviews. This method will not be used in this research study due to its limitations and disadvantages. According to Novick (2008), Telephone interviews are neglected in research and they are typically portrayed as a less desirable option compared to face-to-face interviews. The lack of visual cues during telephone interviews is believed to result in the loss of contextual and nonverbal information, potentially affecting rapport, probing, and interpretation of responses. However, telephone interviews may create a comfortable environment for respondents, enabling them to disclose sensitive information. Furthermore, there is insufficient evidence to support the notion that telephone interviews yield lower quality data.

Ethics

Wagle (2020) states that ethics are a set of rules or guidelines that guide researchers on how research should be conducted in an ethical manner.

The first aim of ethical guidelines are to protect participants' dignity, rights and well being. Another aim of ethical guidelines is to ensure research is ethically reliable. This covers protection of privacy and informed consent. Uk Research and Innovation (2021) supports this and states that researchers have a responsibility to maintain certain standards throughout the conduct of their research.

According to Abbas et al (2012) There are multiple reasons why adhering to ethical norms in research is crucial. Firstly, it supports the fundamental goals of research, including the pursuit of knowledge, truth, and the prevention of errors. For instance, preventing the fabrication, falsification, or misrepresentation of research data contributes to the pursuit of truth and minimizes errors. Secondly, ethical standards foster essential values for collaborative work, such as trust, accountability, mutual respect, and fairness. Lastly, certain ethical norms ensure that researchers can be held accountable to the public.

Bryman and Bell (2007) argues that the following points represent the most significant ethical guidelines to follow within research. First, It is imperative to prevent any form of harm to research participants. Second, respecting the dignity of research participants. Third, Obtaining full consent from participants is essential as well as keeping the research completely private. Additionally, Adequate measures should be taken to ensure the confidentiality of research data. Researchers should also keep all participants anonymous. Finally, it is crucial to be completely honest with the participants about what the research will entail as well as disclose the aims of the research.

Within this research study, all ethical considerations will be identified and assessed. Striking a balance among the research objectives, the importance of considering children's perspectives, and the imperative of minimizing potential harm is crucial (NSPCC, No date).

According to Ferdousi (2015), Children's interests and rights need to be protected as they are vulnerable and mentally immature. Ferdousi (2015) further states that the ethical guidelines are generally the same, however, when researching children, further care needs to be taken and so within this research study, the following principles will be adhered to. Before involving a child in research, it is important to obtain permission from their legal representative, such as a parent or guardian. Additionally, the child should be provided with information that is suitable for their age to understand and agree to participate, which is called assent. In general, if a child is capable of comprehending the research and its implications, their own consent is legally required, rather than relying solely on parental consent (NHS, 2021). Secondly, To ensure that children and their parents fully understand the research, the information provided will include an explanation of what will happen during the research, a clear explanation of what is expected from the child's participation, assurance that the child can freely agree or disagree to participate without facing any negative consequences, emphasis that the child has the right to withdraw from the research at any time, use of language that is easy for the child to understand, with visual aids if needed especially if the child is non-verbal due to their ASD. Parents, headteachers, teachers and therapists will all be debriefed on the details of the study. Letters of consent will be sent to all involved.

It is also noted that if children are not fully informed about the research topic, their consent cannot be considered informed, even if they are capable of making a decision about participation. Informed consent only exists when individuals are fully informed about the research.

Additionally, Child protection and well-being are of utmost importance in research involving children. Such research is conducted to benefit all children and should be carried out ethically and with support and encouragement. During the research process, if any information arises that could potentially harm a child's well-being, it is the responsibility of the researcher to discuss this with the parents or guardians and seek advice from experts in the field. Necessary assistance will be arranged to support the child based on their needs. If there are any indications that the child's safety or well-being is being negatively impacted, the research will be temporarily halted until the issue is addressed. If the child shows signs of being negatively affected by the research, their parent or guardian will be notified, and appropriate support will be offered to the child and their family. Additionally, extra time and support will be provided to accommodate the needs of the child. When disseminating the research findings, it is essential to consider the specific communication needs of the children and their families.

Ultimately, the research must include child protection and child safeguarding. According to NSPCC (No date), safeguarding means to protect the child from abuse, preventing harm to the child's health and ensuring all children have the best outcomes.

When working with ASD children, it is imperative to be extra cautious. This is because ASD children may find it challenging to express their wants and needs, especially if the child is non-verbal. Lack of communication can trigger overwhelming feelings and may lead to a meltdown (National Autistic Society, 2020).

To minimize this risk, non-verbal communication methods will be studied prior. According to NHS Wales (No date), ASD can become quickly overloaded with too much language and so sentences will be broken down, simple words will be used and time will be given to ensure the child can process the information. Also, visual cues will be used including pointing, using gestures, picture cards or writing things down. NHS (No date) continues to state the importance of being specific as well as using the correct facial expressions and body language during communication.

Moreover, within this research study, the children's information will remain completely confidential and they will remain anonymous. This will be achieved by ensuring all non-participants such as other educators, sign a confidentiality agreement form. As well as this, all results published will not reveal any personal information to ensure anonymity. According to Pepperdine university (2019), In an anonymous study, it is not allowed to gather any personally-identifying information. Personally-identifying information includes various data points such as names, addresses, email addresses, phone numbers, government-issued ID numbers (e.g., social security numbers) and others. Consequently, minimal personal data will be acquired and all other data will be stored on a password protection database that is accessible to participants.

Guidelines will also be influenced by the UN convention on the rights of the child (No date). These include articles 3, 8, 12, 13, 16, and 19.

Article 3 states that ensuring the well-being and best interests of the child should be the primary concern in every decision and action that impacts children.

Article 8 states that every child possesses the entitlement to an identity, and it is the duty of governments to uphold and safeguard this right.

Article 12 states that children possess the right to freely express their views, emotions, and desires in all matters that affect them. It is crucial that their perspectives are not only considered but also taken seriously.

Article 13 states that it is essential to ensure that every child has the freedom to articulate their thoughts and opinions and to have unrestricted access to various forms of information, as long as it remains within legal boundaries.

Article 16 states that each child possesses the entitlement to privacy, and it is imperative that the law safeguards their private, family, and domestic life. This includes providing protection against any unlawful actions that may harm a child's reputation.

Article 19 states that Governments hold the responsibility to take all necessary measures in order to safeguard children from any kind of violence, abuse, neglect, or mistreatment perpetrated by their parents or any other individuals responsible for their care.

All articles will be taken into consideration when conducting the research.

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