Investigating Intervention Strategies for Enhancing Social Skills in Children with Autism Spectrum Disorder (ASD).

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# Research Problem Background

Despite extensive research efforts dedicated to exploring autism spectrum disorder (ASD), a significant gap remains in the form of comprehensive studies that integrate early intervention, personalized approaches, and technology-based interventions. While early intervention is widely acknowledged as essential, the potential synergistic effects of combining it with individualized strategies and technology have been largely neglected (Thabtah, Kamalov, & Rajab, 2018). This is further compounded by the fact that many studies tend to have narrow scopes, overlooking the holistic understanding necessary for successful intervention.

To effectively cater to the distinctive requirements of children with ASD, personalized approaches play a pivotal role. The limited research on the interplay between early intervention, personalized techniques, and the integration of technology hampers the author’s understanding of how they collectively aid in improving social skills (Abbas et al., 2017).

Innovative technology-based methods, such as virtual reality and social skills apps, present exciting opportunities for intervention. However, the lack of thorough research studying their combined impact alongside early and personalized interventions limits our understanding of their potential influence (Bone et al., 2014).

The pivotal objective of this study is to bridge the underlying gap by exploring the collective influence of early intervention, personalized techniques, and technology on the social skills of children with ASD. The potential to advance theoretical knowledge and provide valuable insights for more effective interventions is a promising prospect (Wolfers et al., 2015).

# Research Question

How does factors such as early intervention, individualized approaches, and technology-assisted interventions contribute to the success of social skills mediation for children with ASD?

# Justification

**Feasibility:**

• The investigation of intervention strategies for enhancing social skills in children with autism spectrum disorder (ASD) is feasible due to the availability of diverse tools and methodologies within the field of research.

• Utilizing a site review empowers for the productive assortment of information from a worldwide layer of members, ensuring a diverse sample that reflects different countries and ethnicities.

• The application of classification models is feasible for processing and evaluating the collected data, providing valuable insights for early detection and pattern recognition.

**Measurability:**

• The examination question is clear and quantifiable as it means to recognize the best mediation systems for improving interactive abilities in populace determined to have ASD.

• The utilization previous research surveys and application of various classification models provides quantifiable data for the measurement of the effectiveness of different intervention strategies.

• Evaluation measures such as accuracy, precision, recall, and F1-score assess the exhibition of the classification model, guaranteeing clear and quantifiable results.

**Significance:**

• Interactive ability shortfalls fundamentally influence the everyday cooperations and personal satisfaction of people with ASD. Resolving this issue is of vital significance for the prosperity and improvement of youngsters with ASD.

• The research is significant as it addresses a gap in the existing literature by integrating early intervention, individualized approaches, and technology-assisted interventions to enhance social skills, contributing to a more

comprehensive understanding of effective strategies.

• The outcomes of the research will have practical implications for educators, clinicians, and parents, providing valuable insights into tailored interventions for children with ASD.

**Ethical Considerations:**

• The research involves a website survey, ensuring that participation is voluntary, and informed consent will be obtained from participants or their guardians.

• Privacy and confidentiality of participants will be maintained throughout the data collection and analysis processes.

• The redirection of diagnosed ASD patients to the nearest special schools is done with the intention of enhancing their skills and quality of life, to work on their abilities and personal satisfaction, lining up with moral contemplations of improving prosperity and support.

# Specific Items to be Addressed

1. **Website Survey:**
   * Harnessing three datasets on autism screening for adults, adolescents and children through a survey conducted by the National Institute for Health Research (NHS).
   * Development of a user-friendly website survey to collect data on ASD patients, including information on country, ethnicity, and social skills.
   * Implementation of ethical considerations, such as informed consent and privacy measures.
2. **Data Analysis using Classification Models:**
   * Preprocessing of survey data for compatibility with the model by cleaning the data, handling missing values, removing outliers, and balancing the dataset.
   * Implementation of a comprehensive exploration of feature descriptions, meta-information, and statistical details.
   * Splitting the dataset and cleaning categorical features for dataset integrity before application of classification models.
3. **Classification Model:**
   * Training and modelling pre-processed data to classify ASD patients based on country and ethnicity by thorough implementation of various classification models such as decision tree, random forest, support vector machine, naïve bayes, logistic regression, k-nearest neighbour, catboost, XGBoost, one R, RML, Ripper, IBl, LMT, PART, SMO, Stacking, LogitBosst, J48 and IBk.
   * Evaluation of the model's performance using metrics like accuracy, precision, recall, and F1-score.
4. **Redirection to Special Schools:**
   * Integration of a system to redirect diagnosed ASD patients to the nearest special schools based on the classification model's outcomes.
   * Development of educational materials on intervention strategies to enhance skills for ASD patients and their guardians.
5. **Awareness Campaign:**
   * Implementation of an awareness campaign through the website/app to educate diagnosed ASD patients and their guardians about intervention strategies and ways to enhance social skills.
   * Regular updates and communication to ensure continuous support and improvement.

This research project strives to develop a comprehensive framework that addresses important factors, such as country and ethnicity, in the classification of ASD patients. Moreover, it aims to provide guidance for redirecting these individuals to suitable educational institutions and valuable insights on intervention strategies for improving their social skills.

# References

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