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Enhancing Parental Engagement in Special Education Through Game-Based Learning Strategies with Autism Saudi Students

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Abstract

The purpose of this qualitative research undertaken in the current study is to assess the impacts of game-based learning approaches on parents' involvement in ASD education. Quantitative research was used and the method of data collection involved self-completion of pre and post intervention questionnaires for measuring the degree of parental involvement after the use of interactive digital games. Analysis shows that the effectiveness of engagement related to parents has improved dramatically: their attendance of schools' events and communication with teachers and academic staff, respectively. Also, the findings revealed that parental education was a significant predictor of the engagement outcomes pointing to the fact that demographic characteristics do matter when it comes to parental involvement. This paper adds to the literature on ED innovations and offers recommendations to teachers and policymakers, who are in a mission to create suitable learning experiences of children with ASD.

Keywords: game-based learning, parental engagement, autism spectrum disorder, educational innovation

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Introduction

Currently, Saudi Arabia is gradually changing the educational setting for learners diagnosed with ASD, albeit with various challenges. The Ministry of Education in the kingdom of Saudi Arabia has made changes regarding the integration of children with disabilities in their schools; they have implemented policies that facilitate the integration of children with disability into mainstream education (Alrawkan, 2022 February 18). In consideration of the above highlighted policies, it may be said that considerable progress in providing children with the system of education that fits them has been achieved. However, the school activities, associated with parents' active participation in the process of nurturing and supporting child education still remain the topic that needs more discussion and improvement (Yulianti et al., 2021).

On the one hand, the implementation of the strategies of integration of children with ASD to ordinary classes is one of the major goals of the inclusive policies In this regard, the active involvement of parents in this process is one of the major factors, which contribute to the attainment of the best results. Studies show that parents' engagement has a positive association with students' performance, their social adjustment and even their psychological health when the child has been diagnosed with ASD (Yan et al., 2022; Kovács et al., 2022). However, the knowledge of parent involvement in general and the specific strategies of parental involvement for learners with special needs in Saudi Arabia setting is somewhat lacking.

Parental engagement in learning environments is, therefore, variable because cultural beliefs and work-related issues hinder parental participation; these are some of the contextual factors that make engagement difficult (Posey-Maddox & Haley-Lock, 2020). Some of the factors may be: misconceptions about parents' involvement in formal education, lack of effective communication between schools and family and lack of information on the available support system. Solutions for these problems need to be based on

understanding and respecting cultural delineations, as well as involving parents as the active participants and partners of educators.

Additionally, the utilization of game-based learning (GBL) strategies suggests novel ways for increasing children with ASD's educational participation. This is attained through the use of interactivity and realism which follows the cognitive and behavioral pattern most children with autisms exhibit, through play (Nigussie, 2022). Research has recommended that GBL can enhance on social communication, academic achievement and conduct among children with ASD (Lei et al., 2022; Mohd et al., 2020).

In addition to, it has been argued that parents exert a crucial influence in shaping the academic and social enhancement of children with a diagnosis of ASD. The literature survey proves that fathers' and mothers' engagement is directly associated with better academic achievements, increases in social growth, and enhanced behavioral transitions of children with autism (Wang et al., 2020; Fante et al., 2024). Such involvement is important as it strengthens the child's environment, so that educational interventions are consistent in and out of the classroom setting.

Nevertheless, to achieve effective parental involvement especially in the teaching of Asperger's syndrome, there are several difficulties. Parents' cultural beliefs affect parental expectations concerning their roles, as well as their level of participation in school activities and supportive strategies (Hornby & Lafaele, 2023). For instance, in Saudi Arabia, cultural beliefs regarding education and disability may incline people towards misunderstandings over parental responsibilities in learners' education. These cultural practices may act as a barrier to the effectiveness of partnerships between teachers and the parents; hence, the necessity of modifying strategies that recognize families' cultures yet encourage their engagement in learning procedures.

Hindrances that are also attributed to the logistical barriers include the following; The difficulties in accessing transport, school and work demands, other engagements, and lack of communication between schools and parents could mean that a parent misses most of the events at school thus making it hard for them to be actively involved with their child's learning and development (Kelty & Wakabayashi, 2020). Addressing these logistical challenges requires schools to adopt flexible and accessible communication strategies, ensuring that information and opportunities for involvement are readily available to all parents, regardless of their circumstances.

However, the nature of ASD raises additional levels of difficulty by itself. Sometimes, parents can lack the knowledge of their child's individual education requirement and the means through which the child's learning can be facilitated (Lipkin et al., 2020). This simply shows that parents need to be given special guidance and assistance in the form of resource and training that will enable them to understand and be aware of all the requirements and processes that a child with ASD undergoes in the educational process.

Thus, the implementation of GBL in the context of ASD challenges can be viewed as a promising strategy for increasing parents' engagement forms. GBL uses gamelike aspects of the educational process as a method of strengthening knowledge and skills while maintaining order (Ding et al., 2024). Hence, for children with ASD, GBL offers an effective learning environment that favours students' areas of strength which include visual learning and structured tasks beyond simple teacher-guided instruction (Kacmaz et al., 2023).

Through the inclusion of GBL in the practices of schools, parents are ensured an opportunity to become fully engaged in their child's learning process. It allows the parents to be involved with their child's education providers, to track progress of the child and further extend that knowing through provided gameplay. It also assists in the improvement of the parental involvement and ensures that there is congruency of expectations, approaches and objectives of education between home and school environments.

Therefore, the current research endeavours to fill these gaps by examining the relationship between parental involvement and GBL approaches focusing on the Saudi Arabian setting. As a result, awareness of how GBL can maximise parental engagement in educational environments is critical in establishing the right support that will assist the children with ASD to grow. This research does not target simply the

increased achievement levels, although it does endeavour to seek the productive engagement of parents in the educational process and, therefore, to produce better students as well as families.

The Problem of Study

The educational landscape for children with Autism Spectrum Disorder (ASD) in Saudi Arabia faces several challenges, particularly concerning the effective engagement of parents in their children's education. Despite efforts to promote inclusive education policies, there remains a significant gap in understanding how to enhance and sustain parental involvement in the educational journey of children with ASD. Cultural beliefs, logistical constraints, and limited awareness of effective strategies contribute to this gap, hindering the development of collaborative partnerships between educators and parents. This study aims to address these gaps by exploring the potential of game-based learning (GBL) strategies to foster parental engagement and support educational outcomes for children with ASD in Saudi Arabia.

Research Questions

1. How do current levels of parental engagement in the education of children with ASD in Saudi Arabia compare to desired levels?

2. What is the impact of integrating game-based learning strategies on enhancing parental involvement in the educational process of children with ASD?

3. What are the key factors influencing parental engagement and the implementation of game-based learning strategies in the Saudi Arabian context?

Significance of the Study

Enhancing parental engagement in the education of children with ASD through innovative strategies like GBL holds profound significance for several stakeholders. Firstly, for parents, increased involvement can lead to better support for their children's learning needs and improved advocacy within educational settings. Secondly, educators can benefit from enhanced partnerships with parents, facilitating more personalized and effective educational strategies tailored to the unique strengths and challenges of children with ASD (Alotaibi, 2020). Thirdly, policymakers and educational institutions can use insights from this study to refine inclusive education policies and allocate resources more effectively to support children with ASD and their families.

By bridging the gap between theory and practice, this study seeks to provide actionable recommendations that empower parents and educators to collaborate more effectively in supporting the educational development of children with ASD. Ultimately, the study aims to contribute to the enhancement of educational practices that foster inclusivity, equity, and positive outcomes for children with ASD in Saudi Arabia.

Terms of the Study

This study will span a period of one academic year, involving multiple phases to gather comprehensive data. Initially, the study will assess the baseline levels of parental engagement and attitudes towards GBL among parents of children with ASD in selected educational settings in Saudi Arabia. Subsequently, game-based learning interventions will be implemented, incorporating feedback and insights gathered from initial assessments. The study will conclude with a final evaluation of the impact of GBL on parental engagement and educational outcomes, providing a holistic view of its effectiveness in enhancing educational practices for children with ASD.

Limitations of the Study

Several limitations may affect the scope and generalizability of the study findings. Firstly, the study's focus on a specific cultural context within Saudi Arabia may limit the transferability of results to other cultural or regional settings. Secondly, the sample size and demographic characteristics of participants may influence

the extent to which findings can be extrapolated to broader populations of children with ASD and their families. Thirdly, logistical challenges, such as access to resources and participant availability, may impact the implementation and continuity of game-based learning interventions throughout the study period. Despite these limitations, the study aims to provide valuable insights and practical recommendations for enhancing parental engagement and educational outcomes for children with ASD in Saudi Arabia.

Literature Review

The conceptual framework of this research draws from findings on the combination of parental involvement and game-based learning with focus on autism spectrum disorder. Thus, parental engagement means parents' direct participation in their children's learning process and its organization, including support, communication, and activity (Garvis et al., 2021). The results of the investigations reveal the enhancement of students' success, social competence and child's well-being due to parental engagement, including in case of ASD (Wang et al., 2020; Jabery & Arabiat, 2024).

Interactive technologies applied to game-based learning have become a new effective trend in the education of children with ASD, with many benefits documented (Alotaibi, 2020). From the foregoing, GBL provides contained and encouraging setting that matches the learning and behavioral style of children with ASD such as preference for visual learning and structured tasks as recommended by Mohd et al. (2020). Research shows that GBL can enhance the aspects of social communication, academic, and behavioral for children with autism (Gencoglu, 2024; Lei et al., 2022).

Previous authors have looked at each of the aforementioned parental involvement and GBL on children with ASD outcomes separately. Yan et al. (2022) estimated that enhanced parental engagement leads to children with ASD getting better results in their studies as well as better empathy skills. In the same vein, Smith-Young et al. (2022) emphasized on the importance of parents' role as active advocates and supporters when it comes to dealing with educational difficulties and fostering more awareness and accommodation to children with ASD.

Barrett (2020 meta-analysis) also pointed out the positive effects of the GBL programs for the children with ASD regarding the communication skills and the social interactions. A similar study was conducted by Wagan et al. in 2023, where the authors focused on exploring the benefits of a particular GBL platform to increase academic interest and improve behavioral concerns in children with ASD; the authors underlined the possibility of the interactive technologies to alleviate educational problems related to children's ASD.

However, there is a lack of practical implication-based research that addresses the combination of parental involvement and GBL applied to the ASD classroom context especially in Saudi Arabia. Therefore, the strategies must be sensitive to cultural perceptions of concussions as well as logistical practicalities, which may affect parents and educators' general awareness of GBL.

Methods

In the current research, purposive sampling approach was used in identifying the participants from various educational sectors of KSA for children with ASD. In order to meet the study's objectives, participants were selected through purposive sampling; their characteristics included active engagement in educating their child and willingness to engage in game-based learning interventions. This approach was used in a effort to acquire data from parents who are directly involved in the educational process of their child; it allows for a targeted investigation of the aims and objectives of the study within the sociocultural background of Saudi Arabia.

One hundred parents of children with ASD were included in the study. Recruitment of participants occurred depending on the availability and willingness to participate in the research activities, and thus the sample can be considered as heterogeneous and a representative of Saudi Arabian population across different educational levels. The target population was defined by the inclusion criteria highlighting the parents who engaged in the school affairs, stayed in touch with teachers, showed concern in experimenting with new methods of children's learning, namely games to teach.

Instrumentation

Therefore, to measure the levels of parental engagement, a structured questionnaire was designed and used pre and post the interventions involving the game-based learning. The questionnaire consisted of Likert-type question that aimed at determining the participant's engagement in school activities, their interaction with teachers and perceptions of their responsibilities in their child educational process. Certain types and forms of parental engagement are more relevant to the study's goals; thus, the specific features of the questionnaire were selected.

Individuals were exposed to a 12-week game-based learning program intended to support core and related deficits of children with ASD as well as academic interest and self-control. The intervention involved selecting and designing the games that should fit within the McCarthy's scope and sequence within the academic circles and the behaviors/cognitive skills known to be problematic in children with ASD. Hence, by expanding the play-based elements of the setting and introducing aspects of the more formal approach, the intervention focused on developing a supportive context that would correspond to the children's needs in terms of the cognitive and behavioral development of autism.

Validation of Instruments

Cronbach's alpha coefficient was used method to estimate the reliability of the assessment of the Parental Engagement Survey the coefficient was 0. 85. Further, it established reliability coefficients for the survey items which confirmed the stability of the observed constructs of parental engagement in accordance with the response obtained at different points of time in the study.

In fact, face and content validity of the proposed survey instrument was discussed and checked with the help of particular specialists in the sphere of special settings educational activity for children and parents involvement. The experts in the field were used to evaluate and edit the final set of the questionnaire items in the survey, commensurate to the required dimensions of parental engagement, endemic to the study goals and Saudi Arabian culture This ensured the final.

Data Analysis

The quantitative data collected in this study applied a number of statistical tools to assess the effectiveness of the game-based learning developed to enhance parental involvement and students with ASD's academic performance. Summative data, including frequencies, means, and standard deviations, were also calculated to describe the participants' demographics and initial level of parental involvement. In order to analyse the change of parental engagement before and after the intervention, t-tests comparing scores pre- and post-intervention were applied. Comparison of the level of engagement observed before and after the closure of the game-based learning program enabled the determination of the statistical significance of the changes that took place. To investigate the centration of post-intervention parental engagement, multiple regression analysis was used. Demographic data as well as the degree of the initial participation acted as predictors to establish the predictors of the parental involvement in the process of education. To determine the demographic factors and their effects on increased parental engagement depending on the given game-based learning intervention, analysis of variance (ANOVA) was used to evaluate the results while the demographic factors included the parent's educational level and the age of the child. These statistics aided in providing an understanding of how participants' characteristics differed and affected the research findings concerning parental involvement.

Results

Table 1: Descriptive Statistics of Participant Characteristics

Characteristic	Mean (SD) or Frequency (%)

Age of Children (years)	8.5 (2.3)
Parental Age (years)	38.2 (4.5)
Parental Education	
- High School	15%
- Bachelor's Degree	50%
- Master's Degree	30%
- Doctoral Degree	5%
Number of Children	
- Single Child	40%
- Multiple Children	60%

The participants' mean age was 8 years for the children diagnosed with ASD. 5 years with a deviation of 2 years approximately. 3 years, showing that participants are not outstandingly diverse in age and most of them fall within the range of 31-40 years. The ages of parents were also an average of thirty-eight years. The average score for the remaining indicators is two years with the standard deviation of 4. Mean values were 5 years, which indicates a medium spread of parents' ages among the samples. Thus, the educational level of the participants could be characterized as quite high – the majority of parents (80%) had at least a Bachelor's degree. Participants had multiple children; 60% of them, this is in regard to the diversity of family situation exhibited within the subjects.

Table 2: Pre-Intervention and Post-Intervention Parental Engagement Scores

Engagement Measure	**Pre-Intervention Mean Score**	**Std**	**Post-Intervention (Mean ± SD)**	**Std**	**p-value**
Involvement in School Activities	3.6	0.8	4.2	0.6	<0.001
Communication with Educators	3.9	0.7	4.3	0.5	<0.001
Support for Child's Learning	3.8	0.6	4.1	0.4	0.002

The respondents' perception on parental involvement in school activities has shown a marked improvement in that the mean score from 3. From 6 (SD = 0. 8) pre-intervention to 4. 2 (SD = 0. 6) post-intervention (t = - 4. 30, p < 0. 001) suggest that parents' participation in school responsive activities were influenced positively by the game-based learning intervention. Parents/ care givers reported enhanced communication with educators with the mean scores rising from that of 3. Thus, the percentage of teachers who involved their students in at least one guided activity decreased from 9 (SD = 0. 3 (SD = 0. 5) post-intervention (F (1, 14) = 19. 49; p < 0. 001), which implies that parents Teachers' cooperation had improved. Parents perceived enhanced sup-port for the child's learning and this was evident in the mean scores raising from 3. And after the intervention they reduced from 8 (SD = 0. 6) pre-intervention to 4. Mean: 1 (SD = 0. 4) post-intervention (p = 0. 002), suggesting an enhancement in their role in supporting the child's educational efforts.

Table 3: Paired Sample t-tests Comparing Pre-Intervention and Post-Intervention Parental Engagement Scores

Engagement Measure	Mean Difference	Standard Deviation of Difference	t-value	df	p-value	95% Confidence Interval (Lower, Upper)
Involvement in School Activities	0.6	0.9	4.67	99	<0.001	(0.4, 0.8)
Communication with Educators	0.4	0.6	3.82	99	<0.001	(0.3, 0.5)
Support for Child's Learning	0.3	0.5	2.98	99	0.003	(0.2, 0.4)

A significant mean difference of 0.6 ($t = 4.67$, $p < 0.001$) was found by the paired sample t-test, which suggests that parental involvement in school activities rose significantly from the pre-intervention (Mean = 3.6) to the post-intervention (Mean = 4.2). This 95% confidence interval (CI) showed how strong the results were, ranging from 0.4 to 0.8. Parental contact with educators showed a significant mean difference of 0.4 ($t = 3.82$, $p < 0.001$), with scores improving from pre-intervention (Mean = 3.9) to post-intervention (Mean = 4.3). With a 95% confidence interval spanning from 0.3 to 0.5, the observed changes were deemed reliable. The level of parental support for their child's education increased significantly from pre-intervention (Mean = 3.8) to post-intervention (Mean = 4.1), with a mean difference of 0.3 ($t = 2.98$, $p = 0.003$). The 95% CI ranged from 0.2 to 0.4, highlighting the consistency of improvements observed in this engagement measure.

Table 4: Regression Analysis Predicting Post-Intervention Parental Engagement

Predictor Variables	Beta Coefficient	Standard Error	t-value	p-value	95% Confidence Interval (Lower, Upper)
Pre-Intervention Engagement	0.62	0.12	5.17	<0.001	(0.38, 0.86)
Parental Age	0.08	0.04	1.98	0.051	(-0.001, 0.16)
Parental Education (Bachelor's)	0.35	0.18	2.05	0.042	(0.01, 0.69)
Number of Children	-0.12	0.09	-1.32	0.189	(-0.30, 0.06)

Pre-intervention engagement was found to be a significant predictor of post-intervention parental engagement (Beta = 0.62, $t = 5.17$, $p < 0.001$). This suggests that bigger improvements in parental involvement levels prior to the intervention were linked to higher levels of engagement following participation in the game-based learning program. The robustness of this association was confirmed by the 95% confidence interval, which varied from 0.38 to 0.86. Parental age and post-intervention participation had a positive but insignificant connection (Beta = 0.08, $t = 1.98$, $p = 0.051$). Despite the effect not reaching conventional levels of statistical significance, this shows that older parents tended to demonstrate slightly higher levels of engagement post-intervention. The effect size variability was indicated by the 95% confidence interval, which stretched from -0.001 to 0.16.

Higher levels of post-intervention participation were seen in parents with a bachelor's degree (Beta = 0.35, $t = 2.05$, $p = 0.042$). This result implies that after the intervention, parents' increased participation was correlated with their better educational achievement. The strength of this association was shown by the 95% confidence interval, which went from 0.01 to 0.69. Family size was not a significant predictor of post-intervention participation (Beta = -0.12, $t = -1.32$, $p = 0.189$). It may be inferred from this that changes in parental participation levels following the intervention were not significantly impacted by family size. This

predictor's unpredictability and lack of significance are demonstrated by the 95% confidence interval, which stretched from -0.30 to 0.06.

Table 5: ANOVA Examining Demographic Factors and Post-Intervention Parental Engagement

Demographic Variable	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-value	p-value
Parental Education	24.56	3	8.19	3.72	0.012
Parental Age	8.32	1	8.32	1.87	0.173
Number of Children	3.45	1	3.45	0.78	0.379
Interaction (Education*Age)	12.68	3	4.23	1.92	0.123

On post-intervention involvement levels, parental education had a significant main effect ($F(3, 96) = 3.72$, $p = 0.012$). This suggests that the level of education of parents had a major impact on the level of engagement that was seen following the game-based learning intervention. Post-hoc analyses can help determine which particular educational attainment levels were responsible for this effect. The main effect of parental age on post-intervention involvement levels was not statistically significant ($F(1, 98) = 1.87$, $p = 0.173$). This shows that changes in parental engagement after the intervention were not significantly impacted by age alone.

Additionally, the number of children in the family did not significantly affect post-intervention engagement levels ($F(1, 98) = 0.78$, $p = 0.379$), suggesting that the game-based learning intervention's effects on parental involvement were unaffected by family size. Based on $F(3, 96) = 1.92$ and $p = 0.123$, the interaction between age and parental education was not statistically significant. This implies that there was little variation from chance in the combined impact of parental age and educational attainment on post-intervention engagement levels.

Discussion

This research significantly advances the field of special education by examining the ways in which game-based learning methodologies can improve parental involvement in the education of their autistic child (ASD). Many people agree that parental involvement is essential for the social and academic development of kids with ASD (Yan et al., 2022). But because ASD is characterized by special demands and communication difficulties, it has been difficult to facilitate meaningful involvement (Cummins et al., 2020).

The research's conclusions demonstrate the revolutionary power of incorporating interactive digital games into teaching methods. Game-based therapies promote parental support for their children's educational development and increase parental involvement by fostering dynamic and engaging learning settings (Alqudah et al., 2024).

This is in line with theoretical frameworks that highlight how interactive technology promotes engagement and energy mastery (Nguyen et al., 2021). The study's empirical data shows significant improvements in important parental engagement metrics, as well as higher levels of involvement in school sports and more appropriate verbal communication with teachers. These outcomes are essential as they lead to a more collaborative and supportive educational environment for children with ASD (Roberts & Webster, 2022). The study's focus on quantifiable increases in engagement stages fills a critical vacuum in the literature by providing empirical support for innovative teaching methods designed especially to increase parental involvement in the education of children with ASD (Kurzrok et al., 2021).

The study also highlights the significance of demographic factors in determining parental involvement in special education contexts by finding parental education as a key predictor of engagement results. In order to maximize results for children with ASD, this research emphasizes the necessity of customized

educational interventions that take different parental backgrounds and educational levels into account (Martinez-Torres et al., 2021). When looking for research-based methods to increase parental involvement and support in school settings, educators and legislators need to know these kinds of things.

This study stands out as a critical investigation of game-based learning interventions targeted at improving parental participation in the context of education for autism spectrum disorder (ASD). By focusing on how digital games can successfully increase parental involvement in the education of children with ASD, the study fills in important gaps in the body of research. Although previous research has examined many strategies to encourage parental involvement, few have examined the revolutionary possibilities of interactive technologies such as video games in this particular setting (Nadkarni & Prügl, 2021).

The study's empirical evidence of notable gains in important parental engagement metrics following the intervention is what makes it significant. Parents reported improved communication with teachers and more involvement in school activities when they used interactive digital platforms. These results highlight the useful advantages of incorporating technology into teaching methods, which are consistent with theoretical frameworks that support creative ways to encourage parental involvement (Al-Hail et al., 2021). In addition to improving educational achievements for kids with ASD, this real-world application also improves parents' experiences helping their kids grow.

Furthermore, the study advances our understanding of the complex relationship between parental education and other demographic characteristics and engagement results. The results show that after the intervention, greater parental education levels strongly predict higher levels of participation. This realization is in contrast to earlier research paradigms that frequently disregard the effects of demographics or view them as incidental to educational interventions (Hiver & Nagle, 2024). The study highlights the need for customized strategies that recognize and take advantage of varying parental backgrounds in order to maximize educational support for children with ASD. It does this by using ANOVA analyses to clarify the crucial role that educational background plays in influencing parental involvement (Siller et al., 2021).

For educators and legislators looking to improve inclusive educational practices, these findings offer useful information. Schools can encourage a collaborative environment that encourages academic and socio-emotional development by incorporating digital games into their curricula, thereby enabling parents to take a more active role in their child's education. In addition to advancing theoretical debate, this study presents useful implications for utilizing technology to address parental participation gaps and provide more equal educational chances for kids with ASD.

Recommendations

This study filled important gaps in the literature by investigating the effectiveness of game-based learning strategies in raising parental participation in autism spectrum disorder (ASD) education and offering insightful information to educators. The results highlight how interactive digital games can be included into educational frameworks to positively impact children's learning, boost parental involvement, and enhance communication between educators and parents.

One of this study's main contributions is the empirical evidence showing how well game-based therapies enable parents to take a more active role in their child's education. Through the utilization of interactive technology, including video games, parents have reported increased involvement in school-related activities and improved communication with teachers. These results fit theoretical models that support creative methods of student interaction in the classroom.

The impact of demographic characteristics, especially parental education, on engagement outcomes has also been brought to light by this study. To maximize assistance for children with ASD, the findings highlight the necessity of customized educational techniques that take into account a range of parental backgrounds. For educators and policymakers looking for evidence-based strategies to increase parental participation in special education settings, the study offers useful insights by finding that educational attainment is a strong predictor of engagement levels.

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