‘Specialization in ICTs and Special Education: Psychopedagogy of Integration’
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Intervention Programs With the Contribution of Information and Communication Technology to Preschool Children with Pervasive Developmental Disorde

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POSTGRADUATE
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Abstract
The present study examines intervention programs with the contribution of information and communication technology to preschool children with diffuse developmental disorder. To achieve its purpose, it introduces the issue of multimodal socio-emotional interactions and the decisive role they play in how children develop. The work examines pervasive developmental disorder, presenting its definitions from a prior literature, examining the etiology and prevalence of the disorder and then presenting the clinical picture and symptoms of people with ASD. Then, the criteria as presented by the DSM-V are examined, and finally, the social, communicative, and abnormal behaviors as they appear in recent literature, combined with other signs of autism. In addition, the use of ICT in the preschool environment, the modern combinations of ICT and Autism and, finally, the curricula of ICT use in children with autism are presented. Subsequently, the work examines the combination of new technologies in the treatment or management of IAD and finally ICT in interventions for diffuse developmental disorder. Finally, the work presents the discussion and the conclusions.
Keywords: Developmental Disorder, ICT, educational intervention

REFERENCES

Ahmed, N., Raheem, E., Rahman, N., Khan, M. Z. R., Mosabbir, A. A., & Hossain, M. S. (2019). Managing autism spectrum disorder in developing countries by utilizing existing resources: A perspective from Bangladesh. *Autism*, *23*(3), 801-803.

Anastasiades, P., & Zaranis, N. (2017). *Research on e-learning and ICT in education: technological, pedagogical and instructional perspectives*. Springer.

Carlson, K., Wong, A. H. Y., Dung, T. A., Wong, A. C. Y., Tan, Y. K., &Wykowska, A. (2018, November). Training Autistic Children on Joint Attention Skills with a Robot. In *International Conference on Social Robotics* (pp. 86-92). Springer, Cham.

Chetouani, M., Boucenna, S., Chaby, L., Plaza, M., Cohen, D., Chaby, L., ...&Templier, L. (2017). Social Signal Processing and Socially Assistive Robotics in Developmental Disorders.

Cheung, W. S., Hew, K. F., & Chua, S. L. (2016, June). What Information Communication Technology (ICT) had been used in preschool education during the recent decade?. In *EdMedia+ Innovate Learning* (pp. 914-920). Association for the Advancement of Computing in Education (AACE).

Del Coco, M., Leo, M., Carcagnì, P., Fama, F., Spadaro, L., Ruta, L., ...&Distante, C. (2017). Study of mechanisms of social interaction stimulation in autism spectrum disorder by assisted humanoid robot. *IEEE Transactions on Cognitive and Developmental Systems*, *10*(4), 993-1004.

DiPietro, J., Kelemen, A., Liang, Y., &Sik-Lanyi, C. (2019). Computer-and Robot-Assisted Therapies to Aid Social and Intellectual Functioning of Children with Autism Spectrum Disorder. *Medicina*, *55*(8), 440.

Doernberg, E., & Hollander, E. (2016). Neurodevelopmental Disorders (ASD and ADHD): DSM-5, ICD-10, and ICD-11. *CNS spectrums*, *21*(4), 295-299.

Elzouki, S. Y. A., Tashani, O. A., & Cooper, B. (2016). AN EMPATHIC INTENSIVE ENGAGEMENT WITH CHILDREN WITH SEVERE AUTISM IMPROVED THEIR ICT ATTAINMENT LEVELS. *The Eurasia Proceedings of Educational & Social Sciences*, *5*, 139-144.

Fino, R., Lin, M. J., Caballero, A., &Balahadia, F. F. (2017). Disaster Awareness Simulation for Children with Autism Spectrum Disorder Using Android Virtual Reality. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, *9*(2-6), 59-62.

Galán-Mena, J., Ávila, G., Pauta-Pintado, J., Lima-Juma, D., Robles-Bykbaev, V., &Quisi-Peralta, D. (2016, June). An intelligent system based on ontologies and ICT tools to support the diagnosis and intervention of children with autism. In *2016 IEEE Biennial Congress of Argentina (ARGENCON)* (pp. 1-5). IEEE.

Ginn, N. C., Clionsky, L. N., Eyberg, S. M., Warner-Metzger, C., & Abner, J. P. (2017). Child-directed interaction training for young children with autism spectrum disorders: Parent and child outcomes. *Journal of Clinical Child & Adolescent Psychology*, *46*(1), 101-109.

Grossard, C., Grynspan, O., Serret, S., Jouen, A. L., Bailly, K., & Cohen, D. (2017). Serious games to teach social interactions and emotions to individuals with autism spectrum disorders (ASD). *Computers & Education*, *113*, 195-211.

Grossard, C., Palestra, G., Xavier, J., Chetouani, M., Grynszpan, O., & Cohen, D. (2018). ICT and autism care: state of the art. *Current opinion in psychiatry*, *31*(6), 474-483.

Gutting, L., O'Brien, C., &Moggie, K. (2018). Adapted Dance Class and Autism Spectrum Disorder.

Haglund, N. (2017). *Autism in Children; The importance of early detection and intervention*. Lund University.

Hardy, C., Ogden, J., Newman, J., & Cooper, S. (2016). *Autism and ICT: A guide for teachers and parents*. Routledge.

Hartholt, A., Mozgai, S., Fast, E., Liewer, M., Reilly, A., Whitcup, W., & Rizzo, A. S. (2019, September). Virtual humans in augmented reality: A first step towards real-world embedded virtual roleplayers. In *Proceedings of the 7th International Conference on Human-Agent Interaction* (pp. 205-207).

Hume, K., Barton, E. E., Boyd, B. A., &Reichow, B. (2018). Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD). *The Cochrane Database of Systematic Reviews*, *2018*(5).

Kamaruddin, K., Abdullah, C. A. C., Idris, M. N., &Nawi, M. N. M. (2017, October). Teachers' level of ICT integration in teaching and learning: A survey in Malaysian private preschool. In *AIP Conference Proceedings* (Vol. 1891, No. 1, p. 020075). AIP Publishing.

Kim, S. H., Bal, V. H., & Lord, C. (2018). Longitudinal follow-up of academic achievement in children with autism from age 2 to 18. *Journal of Child Psychology and Psychiatry*, *59*(3), 258-267.

Kim, S. H., Kim, Y. S., Koh, Y. J., Lim, E. C., Kim, S. J., & Leventhal, B. L. (2016). Often Asked but Rarely Answered: Can Asians Meet DSM-5/ICD-10 Autism Spectrum Disorder Criteria?. *Journal of child and adolescent psychopharmacology*, *26*(9), 835-842.

Konca, A. S., Ozel, E., &Zelyurt, H. (2016). Attitudes of preschool teachers towards using information and communication technologies (ICT). *International Journal of Research in Education and Science*, *2*(1), 10-15.

Kuravackel, G. M., Ruble, L. A., Reese, R. J., Ables, A. P., Rodgers, A. D., &Toland, M. D. (2018). Compass for hope: Evaluating the effectiveness of a parent training and support program for children with ASD. *Journal of autism and developmental disorders*, *48*(2), 404-416.

Lorenzo, G., Lledó, A., Pomares, J., &Roig, R. (2016). Design and application of an immersive virtual reality system to enhance emotional skills for children with autism spectrum disorders. *Computers & Education*, *98*, 192-205.

Lyall, K., Croen, L., Daniels, J., Fallin, M. D., Ladd-Acosta, C., Lee, B. K., ...& Windham, G. C. (2017). The changing epidemiology of autism spectrum disorders. *Annual review of public health*, *38*, 81-102.

Martinez, J. R., Waters, C. L., Conroy, M. A., &Reichow, B. (2019). Peer-Mediated Interventions to Address Social Competence Needs of Young Children With ASD: Systematic Review of Single-Case Research Design Studies. *Topics in Early Childhood Special Education*, 0271121419839136.

Mertala, P. (2017). Wag the dog–The nature and foundations of preschool educators' positive ICT pedagogical beliefs. *Computers in Human Behavior*, *69*, 197-206.

Mora-Guiard, J., Crowell, C., Pares, N., & Heaton, P. (2017). Sparking social initiation behaviors in children with Autism through full-body Interaction. *International Journal of Child-Computer Interaction*, *11*, 62-71.

Papadakis, S., Kalogiannakis, M., &Zaranis, N. (2016). Comparing tablets and PCs in teaching mathematics: An attempt to improve mathematics competence in early childhood education. *Preschool and Primary Education*, *4*(2), 241-253.

Parsons, D., Wilson, N. J., Vaz, S., Lee, H., &Cordier, R. (2019). Appropriateness of the TOBY Application, an iPad Intervention for Children with Autism Spectrum Disorder: A Thematic Approach. *Journal of autism and developmental disorders*, *49*(10), 4053-4066.

Parsons, S. (2016). Authenticity in Virtual Reality for assessment and intervention in autism: A conceptual review. *Educational Research Review*, *19*, 138-157.

Pennisi, P., Tonacci, A., Tartarisco, G., Billeci, L., Ruta, L., Gangemi, S., &Pioggia, G. (2016). Autism and social robotics: A systematic review. *Autism Research*, *9*(2), 165-183.

Robinson, E. B., St Pourcain, B., Anttila, V., Kosmicki, J. A., Bulik-Sullivan, B., Grove, J., ... & Martin, J. (2016). Genetic risk for autism spectrum disorders and neuropsychiatric variation in the general population. *Nature genetics*, *48*(5), 552.

Robles-Bykbaev, V., Arévalo-Fernández, C., Naranjo-Cabrera, E., Quito-Naula, P., Pauta-Pintado, J., Ávila, G., & Quezada, R. (2017, July). A hybrid approach based on multi-sensory stimulation rooms, robotic assistants and ontologies to provide support in the intervention of children with autism. In *International Conference on Applied Human Factors and Ergonomics* (pp. 477-487). Springer, Cham.

Schmidt, M., Schmidt, C., Glaser, N., Beck, D., Lim, M., & Palmer, H. (2019). Evaluation of a spherical video-based virtual reality intervention designed to teach adaptive skills for adults with autism: a preliminary report. *Interactive Learning Environments*, 1-20.

Skoufou, A. (2019). Social Interaction of Preschool Children with Autism Spectrum Disorders (ASD)-Characteristics and Educational Approaches. *Online Submission*, *6*(6), 28-36.

Tarantino, L., Mazza, M., Valenti, M., & De Gasperis, G. (2016). Towards an integrated approach to diagnosis, assessment and treatment in autism spectrum disorders via a gamified TEL system. In *Methodologies and Intelligent Systems for Technology Enhanced Learning* (pp. 141-149). Springer, Cham.

Telisheva, Z., Turarova, A., Zhanatkyzy, A., Abylkasymova, G., &Sandygulova, A. (2019, November). Robot-Assisted Therapy for the Severe Form of Autism: Challenges and Recommendations. In *International Conference on Social Robotics* (pp. 474-483). Springer, Cham.

Tick, B., Bolton, P., Happé, F., Rutter, M., &Rijsdijk, F. (2016). Heritability of autism spectrum disorders: a meta-analysis of twin studies. *Journal of Child Psychology and Psychiatry*, *57*(5), 585-595.

Vlachou, J. A., & Drigas, A. S. (2017). Mobile Technology for Students & Adults with Autistic Spectrum Disorders (ASD). *International Journal of Interactive Mobile Technologies*, *11*(1).

Webb, N. B. (2018). *Social work practice with children*. Guilford Publications.

Wu, C., & Zheng, Q. (2019). Motion Sensing Games for Children with Autism Spectrum Disorder. In *VR, Simulations and Serious Games for Education* (pp. 55-65). Springer, Singapore.

Yang, E. (2018, June). A Study on Virtual Reality Contents for Parents Education with ASD (Autism Spectrum Disorder) Children. In *INTERNATIONAL CONFERENCE ON FUTURE INFORMATION & COMMUNICATION ENGINEERING* (Vol. 10, No. 1, pp. 101-104).

Yun, S. S., Choi, J., Park, S. K., Bong, G. Y., &Yoo, H. (2017). Social skills training for children with autism spectrum disorder using a robotic behavioral intervention system. *Autism Research*, *10*(7), 1306-1323.

Zaki, T., Islam, M. N., Uddin, M. S., Tumpa, S. N., Hossain, M. J., Anti, M. R., & Hasan, M. M. (2017, September). Towards developing a learning tool for children with autism. In *2017 6th International Conference on Informatics, Electronics and Vision & 2017 7th International Symposium in Computational Medical and Health Technology (ICIEV-ISCMHT)* (pp. 1-6). IEEE.

Zorcec, T., Robins, B., &Dautenhahn, K. (2018, September). Getting Engaged: Assisted Play with a Humanoid Robot Kaspar for Children with Severe Autism. In *International Conference on Telecommunications* (pp. 198-207). Springer, Cham.

Βότσης, Κ. Χ. (2018). Αξιοποίηση των ΤΠΕ στη διδασκαλία παιδιών που βρίσκονται στο φάσμα του αυτισμού (Master'sthesis).

Ντάσιου, Ε. (2012). Πολυμεσική εφαρμογή για παιδιά με αυτισμό.

Παπαποστόλου, Π. (2017). Μάθηση, τεχνολογία και καινοτομία. Μια υποστηρικτική εφαρμογή για την κοινωνική ένταξη των παιδιών με αυτισμό.

Συριοπούλου, Χ., Κάσιμος, Δ. &Ζαφειρίου, Δ., 2010. Αναπτυξιακά Διαγνωστικά κριτήρια και μέσα αξιολόγησης του Αυτισμού και άλλων Διάχυτων Αναπτυξιακών Διαταραχών. Παιδιατρική Βορείου Ελλάδος, 22(4), pp.357-363.

Τσιόπελα, Δ., & Τζιμογιάννης, Α. (2018). Οι ΤΠΕ στην εκπαίδευση ατόμων με Διαταραχές Αυτιστικού Φάσματος: Βιβλιογραφική επισκόπηση. Θέματα Επιστημών και Τεχνολογίας στην Εκπαίδευση, 10(1), 19-35.