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Mathematical Learning Disabilities a Neurological View and the role of Digital Technologies

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Abstract—The present article is a literature review of recent researches that have to do with children with mathematical learning disabilities especially dyscalculia and ageometria. Our focus is on researches regarding neurosciences, mainly on the brain structure and the areas where various mathematical processes are performed. In addition, we present researches that show the role of hippocampus during arithmetic problem solving.

Keywords— hemispheres, parietal lobe, intraparietal sulcus, hippocampus

1 GENERAL ISSUES

Learning difficulties in Mathematics have been studied by many researchers over time and some common features have been formulated such as [1,2]:

- 1) They have visual-spatial deficits.
- 2) They confuse mathematical symbols and as a result, they perform wrong actions.
- 3) They confuse some symbols of numbers (e.g. 6 and 9)
- 4) They find it difficult to speak numbers with more than one digit (e.g. 47890).

In the present article special learning difficulties in mathematics that are known as “dyscalculia” and “ageometria” will be analyzed. The term “Dyscalculia” is composed of the Greek “dys” which means without or with difficulty and the Latin term “calculia” which means count and is used to describe difficulties that people have with numbers [3]. The term “ageometria” refers to the visual-spatial difficulty that someone has and it relates to difficulties in perceiving space and understand geometry [4]. As Cohen Kadosh et al (2007) refer the term dyscalculia is sometimes mistakenly used to describe those who perform poorly in mathematics, on the contrary dyscalculia must be used to describe someone that has specific arithmetic disorders [5].

From the earliest studies that tried to identify the causes of learning disabilities, scientists have turned to neurological functions [6,7]. Many of them believe that the problem is due to the structure of the brain.

The brain’s cerebral cortex is divided into the cerebral hemispheres, each of which has been divided into frontal, parietal, temporal and occipital lobes. Brian functions are performed in many different regions of the brain that are working in conjunction, but each lobe carries out the major burden of a certain function [8]. The processing of sensory information is performed in the temporal lobe. Certain areas in the temporal lobe are responsible for visual processing; the media temporal lobe contains the hippocampus which is important for memory, learning and emotions. The primary auditory cortex receives auditory information and processes sound information. The occipital lobe is the visual processing center, the primary visual cortex receives visual information from the eyes and this information is transmitted to secondary visual areas, which interpret depth, distance, location and identity of the object being seen. So we can conclude that any damage to the brain can cause a variety of difficulties in Geometry and Mathematics.

Arsalidou and Taylor (2011), with the help of ALE (Activation Likelihood Estimate) analysis, using quantitative meta analyses of fMRI researches they looked into brain areas that were used for number and calculation tasks. Numerical processing was correlated with areas in the parietal lobes (the inferior and superior parietal lobules). In calculation task activity in parietal areas was also observed for arithmetic operations. However, in calculation tasks, more prefrontal areas such as the middle and superior frontal gyri were activated. In particular during addition problems visual areas of the brain were involved as well as parietal areas, frontal and prefrontal regions, bilateral thalamus, right insula, right claustrum and bilateral cerebellum. In subtraction tasks occipito-temporal visual regions, parietal areas, frontal and prefrontal regions, bilateral insula and right cerebellum were activated. In the end, during multiplication tasks occipitotemporal visual regions, parietal areas, temporal regions, frontal and prefrontal regions, bilateral cingulate gyrus, bilateral thalamus, left claustrum, right insula, right caudate body and right cerebellum were activated. They described the two neural activity networks that perform mathematical calculations. The lower cerebral area of the two hemispheres (first network) is responsible for semantic knowledge (the individual perceives quantities and sizes) [9]. The second network is responsible for verbal coding of numbers, storing arithmetic sequences, optically recall. To sum up, they found that [10]:

1. Although there was a great overlap between important ALE regions during the numbers and calculation tasks, the areas of the prefrontal cortices were the areas that differed.
2. Calculation problem solving enabled more areas in the prefrontal areas than numerical task solving. This difference indicates that solving calculation tasks needs more cognitive resources, such as working memory, than numerical tasks.
3. Actions of addition, subtraction and multiplication activated the prefrontal and parietal areas in the left and right hemispheres: Specifically, during addition, the left hemisphere was mostly energized, in subtraction it was bilateral or mostly left and primarily right hemisphere in multiplication.

In the next figure (figure 1) we can see the areas of the brain activated by numerical tasks (a picture), calculation tasks (b picture) and the brain regions that are activated when performing arithmetic operations such as addition, subtraction, multiplication (c picture).

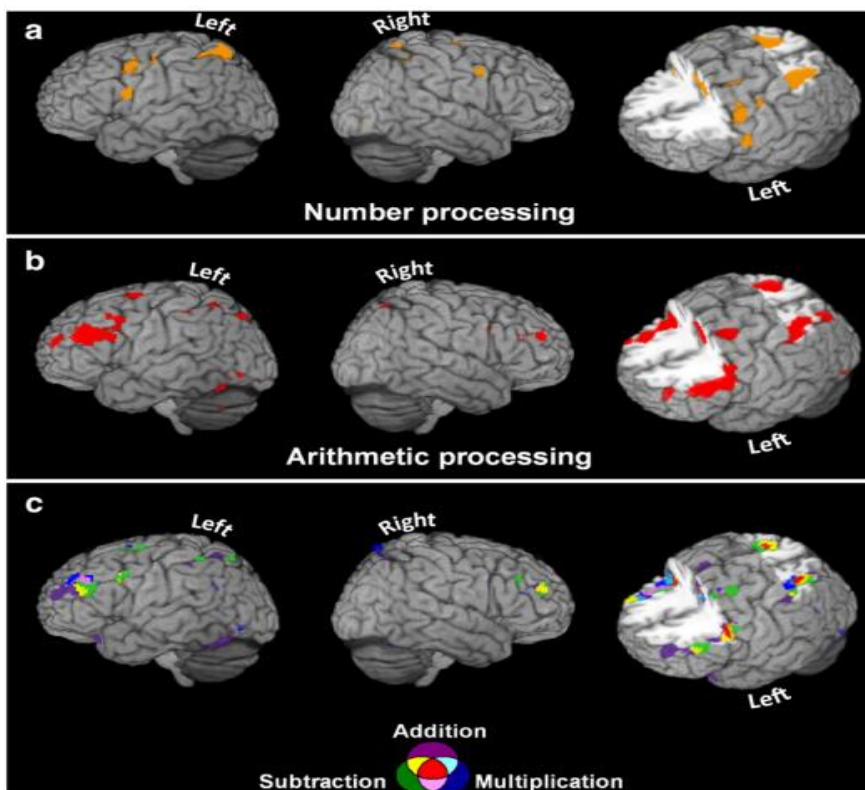


Figure 1. Brain activities by mathematical calculation (Arsalidou & Taylor, 2011)

The c image depicts brain regions that are activated during processes of addition (purple), subtraction (green) and multiplication (blue). Red indicates areas used in all three actions (addition, subtraction, multiplication). Yellow indicates common areas for addition and subtraction; light blue shows areas common for addition and multiplication, while pink depicts brain regions common to subtraction and multiplication [10].

2 MATHEMATICS AND BRAIN ACTIVITIES

Children with learning disabilities have difficulties in mathematics. This is expected since solving a problem requires language processing in which children with dyslexia are lagging behind. Besides, these children present problems in phonological processing and short-term memory [11, 12]. Literature reviews of the past two decades assign mathematic learning disabilities to genetic causes or malfunctions of certain areas of the brain responsible for processing numbers, quantities, mathematical symbols and numerals [13-16].

According to studies the cause of dyscalculia is located in the parietal lobe and more specifically in the intraparietal sulcus in the two hemispheres of the brain. Researches argue that dyscalculia is due to a brain dysfunction involving the left intraparietal sulcus (IPS) [17], while others the right intraparietal sulcus (IPS) [18].

Gruber and colleagues (2001) using functional magnetic resonance imaging (fMRI), mapped human brain activity in six healthy humans performing numerical procedures and other controlled activities that affect visual-constructive, linguistic, attention and mnemonic functions. Specifically they investigated two regions of the brain during calculation and non-mathematical tasks. They concluded that similar cortical networks consisting of bilateral prefrontal, premotor and parietal regions were activated, while in parietal sub-regions different areas were involved in the above tasks. In particular the superior parietal lobules were activated during non-arithmetic number or letter substitution tasks whereas calculation activated the left dorsal angular gyrus and the medial parietal cortices. Another finding was that the left inferior frontal areas were activated during complex calculating tasks. These areas are also involved in working and linguistic memory functions. [19].

Kadosh and his colleagues (2007) conducted an experiment to identify which of the intraparietal sulcus is responsible for DD. The experiment involved two groups nondyscalculic and dyscalculic. The first group consisted of 5 persons (four males, mean group age = 28.6 years, standard deviation = 4.5), with normal vision and without neurological or psychiatric disorders. The second consisted of 5 persons (three males, mean group age = 27.2 years, standard deviation = 4.8) who were diagnosed with DD via an age-standardized battery of numerical tests based on McCloskey neurocognitive model [20] and did not have other learning difficulties. The procedure was performed with the help of fMRI-guided transcranial magnetic stimulation (TMS) neuronavigation. The results showed that both intraparietal sulci are involved in automatic size processing, but only the right IPS is significantly necessary for automatic magnitude activation. However, they argued that this is not in contradiction with previous studies which argued that the left hemisphere has a possible role in numerical processing [17], they suggested that these findings are caused by inefficient verbal processing of numbers [21].

Rosenberg Lee et al. (2015) researched brain circuits on children aged 7-9 during addition and subtraction problems in San Francisco. Two groups were selected after a long process, one with typically development (TD) and one with DD. These groups had similar age, IQ, reading ability and working memory and differed in mathematical abilities. The final groups consisted of 16 with DD (10 girls, 6 boys) and 20 TD children (11 girls, 9 boys). Results showed that children with DD found it more difficult to solve subtraction than addition problems. In addition, hyper-activation during addition and subtraction problems was present in multiple frontal, parietal and visual areas. Another finding was that DD children even if they solved addition and subtraction problems correctly or incorrectly showed high levels of hyper-activation in the parietal cortex. Also, children with DD showed hyper-connectivity of the IPS to prefrontal and parietal cortices. In the end they could say that children with DD have difficulties in problem solving because of inappropriate task modulation and hyper-connectivity, rather than under-engagement and under-connectivity. It is worth mentioning that during addition, the bilateral hippocampus showed greater activation than in subtraction in both groups [22].

3 HIPPOCAMPUS

Researches in children have shown higher brain activity in the right hippocampus, parahippocampal gyrus (PHG) and other areas of the brain, during arithmetic problem solving. In addition, further analysis has shown interactions between the hippocampus and other areas of the brain. Also, the right hippocampus showed a large scale of connectivity with bilateral ventrolateral (VLPFC) and dorsolateral prefrontal cortex (DLPFC) [23]. Other researchers support that when children solved arithmetic problems they used mainly the hippocampus and VLPFC and DLPFC while adults use other areas of the brain [24].

4 CONCLUSIONS

The exploring of research led us to the conclusion that the causes of dyscalculia and ageometria are multifactorial. In this article we focused mainly on the brain structure and the areas where various mathematical processes are performed which has been proven to be dysfunctional in children with specific learning disabilities. Studies vary and are not all consistent, so we can conclude that number processing involves many complex processes and neuron systems located in different brain regions [25] that also change with age [26].

Finally we underline the importance of the digital technologies in education domain and especially in the mathematical learning disabilities that is very productive and successful, facilitates and improves the assessment, the intervention and the educational procedures via Mobiles which brings educational activities everywhere [33-47], various ICTs applications which are the core supporters of education [48-103], AI, STEM & ROBOTICS which raise educational procedures into new levers of performance [104-127], and games which transforms the education in a very friendly and enjoyable interaction [128-145]. Additionally the enhancement and combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [146-199] as well as with environmental factors and nutrition [27-32], accelerates and improves more over the educational practices and results, especially in the in the mathematical learning disabilities domain and its practices like assessment and intervention.

5 REFERENCES

- [1] Geary, D. (2010). Mathematical disabilities: Reflections on cognitive, neuropsychological, and genetic components. *Learning and individual differences* , 20 (2), pp. 130-133.
- [2] Miller, S. P., & Mercer, C. D. (1997). Educational aspects of mathematics disabilities. *Journal of lerning disabilities.* , 30 (1), pp. 47-65.
- [3] Kadosh, R. C., & Walsh, V. (2007). Dyscalculia. *Current Biology* , 17 (22).
- [4] Plerou, A. (2014). Dealing with Dyscalculia over time. *International Conference on Information Communication Technologies in Education* .
- [5] Drigas, A., Pappas, M., & Lytras, M. (2016). Emerging Technologies for ICT based Education for Dyscalculia: Implications for Computer Engineer Education. *International Journal of Engineering Education* , 32 (4), pp. 1604-1610.
- [6] Hinshelwood, J. (1917). *Congenital Word-Blindness*. London: H. K. Lewis.
- [7] Hermann, K. (1959). *Reading Disability*. Copenhagen: Munksgaard.
- [8] Craig, G. J., & Baucum, D. (1999). *Human development*. Prentice-Hall, Inc.
- [9] Dennis, M., Berch, D., & Mazzocco, M. (2009). Mathematical learning disabilities in special populations: phenotypic variation and cross-disorder comparisons. *Developmental Disabilities Research Reviews* , 15, pp. 80-89.
- [10] Arsalidou, M., & Taylor, M. J. (2011). Is $2+2=4$? Meta-analyses of brain areas needed for numbers and calculations. *Neuroimage* , 54 (3), pp. 2382-2393.

- [11] Paulesu, E., Frith, U., Snowling, M., Gallagher, A., Morton, J., et al. (1996). Is developmental dyslexia a disconnection syndrome? Evidence from PET scanning. *Brain*, 119, pp. 143-157.
- [12] Nation, K., Adams, J., Bowyer-Crane, C. A., & Snowling, M. J. (1999). Working memory deficits in poor comprehenders reflect underlying language impairments. *Journal of experimental child psychology*, 73 (2), pp. 139-158.
- [13] Butterworth, B. (2005). Developmental dyscalculia.
- [14] Carey, S. (2004). Bootstrapping and the origin of concepts. *Daedalus* (133), pp. 59-68.
- [15] Mazzocco, M., Feigenson, L., & Halberda, J. (2011). Impaired acuity of the approximate number system underlies mathematical learning disability (dyscalculia).
- [16] Piazza, M., Facoetti, A., Trussardi, A., Berteletti, I., Conte, S., et al. (2010). Developmental trajectory of number acuity reveals a severe impairment in developmental dyscalculia. *Cognition* (116), pp. 33-41.
- [17] Isaacs, E., Edmonds, C., Lucas, A., & Gadian, D. (2001). Calculation difficulties in children of very low birthweight. A neural correlate *Brain* (124), pp. 1701-1707.
- [18] Molko, N., Cachia, A., Riviere, D., Mangin, J., Bruandet, M., et al. (2003). Functional and structural alterations of the intraparietal sulcus in a developmental dyscalculia of genetic origin. *Neuron* (50), pp. 847-858.
- [19] Gruber, O., Indefrey, P., Steinmetz, H., & Kleinschmidt, A. (2001). Dissociating neural correlates of cognitive components in mental calculation. *Cerebral Cortex*, 11, pp. 350-359.
- [20] McCloskey, M., Caramazza, A., & Basili, A. (1985). Cognitive mechanisms in number processing and calculation: Evidence from dyscalculia. *Brain Cogn*, 4, pp. 171-196.
- [21] Kadosh, R. C., Kadosh, K. C., Schuhmann, T., Kaas, A., Goebel, R., et al. (2007). Virtual Dyscalculia Induced by Parietal -Lobe TMS Impairs Automatic Magnitude Processing. *Current Biology*, 17 (8), pp. 689-693.
- [22] Rosenberg-Lee, M., Ashkenazi, S., Chen, T., Young, C. B., Geary, D. C., et al. (2015). Brain hyper-connectivity and operation-specific deficits during arithmetic problem solving in children with developmental dyscalculia. *Developmental science*, 18 (3).
- [23] Cho, S., Metcalfe, A. W., Young, C. B., Ryali, S., Geary, D. C., & Menon, V. (2012). Hippocampal/prefrontal engagement and dynamic causal interactions in the maturation of children's fact retrieval. *Journal of Cognitive Neuroscience*, 24, pp. 1849-1866.
- [24] Rivera, S. M., Reiss, A. L., Eckert, M. A., & Menon, v. (2005). Developmental changes in mental arithmetic: evidence for increased functional specialization in the left inferior parietal cortex. *Cerebral cortex*, 15 (11), pp. 1779-1790.
- [25] Fias, W., Menon, V., & Szucs, D. (2013). Multiple components of developmental dyscalculia. *Trends in Neuroscience and Education*, 2, pp. 43-47.
- [26] Peters, L., & De Smedt, B. (2018). Arithmetic in the developing brain: a review of brain imaging studies. *Developmental Cognitive Neuroscience*, 30, pp. 265-279.
- [27] Stavridou Th., Driga, A.M., Drigas, A.S., 2021. Blood Markers in Detection of Autism, *International Journal of Recent Contributions from Engineering Science & IT (iJES)* 9(2):79-86.
- [28] Zavitsanou, A., & Drigas, A. (2021). Nutrition in mental and physical health. *Technium Soc. Sci. J.*, 23, 67.
- [29] Driga, A.M., Drigas, A.S. 2019 "Climate Change 101: How Everyday Activities Contribute to the Ever-Growing Issue", *International Journal of Recent Contributions from Engineering, Science & IT*, vol. 7(1), pp. 22-31. <https://doi.org/10.3991/ijes.v7i1.10031>
- [30] Driga, A.M., and Drigas, A.S. 2019 "ADHD in the Early Years: Pre-Natal and Early Causes and Alternative Ways of Dealing." *International Journal of Online and Biomedical Engineering (IJOE)*, vol. 15, no. 13, p. 95., doi:10.3991/ijoe.v15i13.11203
- [31] A Fotoglou, I Moraiti, A Diamantis, V Stergios, Z Gavriilidou, A Drigas 2022 Nutritious Diet, Physical Activity and Mobiles. *The Game Changers of ADHD BioChemMed* 3 (2), 87-106
- [32] V Tsopanidou, A Drigas 2022 ENVIRONMENTAL FACTORS AND THEIR EFFECT ON THE OCCURRENCE OF AUTISM *BioChemMed* 3 (1)

- [33] Vlachou J. and Drigas, A. S., 2017 “Mobile technology for students and adults with Autistic Spectrum Disorders (ASD),” *International Journal of Interactive Mobile Technologies*, vol. 11(1), pp. 4-17,
- [34] Papoutsis C., Drigas, A. S., and C. Skianis, 2018 “Mobile Applications to Improve Emotional Intelligence in Autism – A Review,” *Int. J. Interact. Mob. Technol. (iJIM)*; Vol 12, No 6,
- [35] Karabatzaki, Z., Stathopoulou, A., Kokkalia, G., Dimitriou, E., Loukeri, P., Economou A., & Drigas, A. (2018). Mobile Application Tools for Students in Secondary Education. An Evaluation Study. *International Journal of Interactive Mobile Technologies (iJIM)*, 12(2), 142-161
- [36] Stathopoulou A., Loukeris D., Karabatzaki Z., Politi E., Salapata Y., and Drigas, A. S., 2020 “Evaluation of Mobile Apps Effectiveness in Children with Autism Social Training via Digital Social Stories,” *Int. J. Interact. Mob. Technol. (iJIM)*; Vol 14, No 03,
- [37] Stathopoulou, et al 2018, Mobile assessment procedures for mental health and literacy skills in education. *International Journal of Interactive Mobile Technologies*, 12(3), 21-37,
- [38] Drigas, A., Kokkalia, G. & Lytras, M. D. (2015). Mobile and Multimedia Learning in Preschool Education. *J. Mobile Multimedia*, 11(1-2), 119–133.
- [39] Kokkalia G, AS Drigas, A Economou 2016 Mobile learning for preschool education. *International Journal of Interactive Mobile Technologies* 10 (4)
- [40] Stathopoulou A, Karabatzaki Z, Tsiros D, Katsantoni S, Drigas A 2019 Mobile apps the educational solution for autistic students in secondary education *International Journal of Interactive Mobile Technologies*. 2019, Vol. 13 Issue 2, p89-101
- [41] Drigas A, DE Dede, S Dedes 2020 Mobile and other applications for mental imagery to improve learning disabilities and mental health *International Journal of Computer Science Issues (IJCSI)* 17 (4), 18-23
- [42] Alexopoulou A, Batsou A, Drigas A, 2020 Mobiles and cognition: The associations between mobile technology and cognitive flexibility *iJIM* 14(3) 146-156
- [43] M Anagnostou, A Drigas 2022 Mobile Applications for stress management *Scientific Electronic Archives* 15 (2)
- [44] P Leliopoulos, A Drigas 2022 The evolution of wireless mobile networks and the future 5G mobile technology for sustainability. *Technium Sustainability*, 2(4), 28–43. 2 (4), 28-43
- [45] A Doulou, A Drigas, C Skianis 2022 Mobile applications as intervention tools for children with ADHD for a sustainable education. *Technium Sustainability*, 2(4), 44–62. 2 (4), 44-62
- [46] V Tsakou, A Drigas 2022 Early Detection of Preschool Children with ADHD and the role of mobile Apps and AI *Technium Social Sciences Journal* 30, 127-137
- [47] E Karagianni, A Drigas 2022 Language Development and Mobile Apps for Down Syndrome Children *Technium Social Sciences Journal* 34, 193-213
- [48] Drigas, A. S., & Ioannidou, R. E. (2011, September). ICTs in special education: A review. In *World Summit on Knowledge Society* (pp. 357-364). Springer, Berlin, Heidelberg.
- [49] Drigas, A. S., J.Vrettaros, L.Stavrou, D.Kouremenos, 2004. E-learning Environment for Deaf people in the E-Commerce and New Technologies Sector, *WSEAS Transactions on Information Science and Applications*, Issue 5, Volume 1, November
- [50] Drigas, A.S., Vrettaros, J. and Kouremenos, D. (2004) ‘Teleeducation and e-learning services for teaching English as a second language to deaf people, whose first language is the sign language’, *WSEAS Transactions on Information Science and Applications*, Vol. 1, No. 3, pp.834–842.
- [51] Drigas, A., Koukianakis, L., Papagerasimou, Y., 2011, Towards an ICT-based psychology: *Epsychology, Computers in Human Behavior*, 27:1416–1423. <https://doi.org/10.1016/j.chb.2010.07.045>
- [52] Charami, F., & Drigas, A. (2014). ICTs in English Learning and Teaching. *International Journal of Engineering and Science*. Vol. 2(4):4-10. DOI: 10.3991/ijes.v2i4.4016
- [53] Drigas A.S., Kouremenos D (2005) An e-learning system for the deaf people. In: *WSEAS transaction on advances in engineering education*, vol 2, issue 1, pp 20–24
- [54] Drigas A., Pappas M, and Lytras M., 2016. “Emerging technologies for ict based education for dyscalculia: Implications for computer engineering education,” *International Journal of Engineering Education*, vol. 32, no. 4, pp. 1604–1610,

- [55] Drigas, A. & Kokkalia, G. 2017. ICTs and Special Education in Kindergarten. *International Journal of Emerging Technologies in Learning* 9 (4), 35–42.
- [56] Drigas, A. S., Stavridis, G., & Koukianakis, L. (2004). A Modular Environment for E-learning and E-psychology Applications. *WSEAS Transactions on Computers*, 3(6), 2062-2067..
- [57] Drigas, A., Leliopoulos, P.: Business to consumer (B2C) e-commerce decade evolution. *Int. J. Knowl. Soc. Res. (IJKSR)* 4(4), 1–10 (2013)
- [58] Pappas M, Drigas A, Papagerasimou Y, Dimitriou H, Katsanou N, Papakonstantinou S, et al. 2018; Female Entrepreneurship and Employability in the Digital Era: The Case of Greece. *Journal of Open Innovation: Technology, Market, and Complexity*. 4(2): 15.
- [59] Papanastasiou G., Drigas, A. S., Skianis Ch., M. Lytras & E. Papanastasiou, 2018. “Patient-Centric ICTs based Healthcare for students with learning, physical and/or sensory disabilities,” *Telemat Inform*, vol. 35, no. 4, pp. 654–664, 2018. <https://doi.org/10.1016/j.tele.2017.09.002>
- [60] Drigas, A., & Kontopoulou, M. T. L. (2016). ICTs based Physics Learning. *International Journal of Engineering Pedagogy (iJEP)*, 6(3), 53-59. <https://doi.org/10.3991/ijep.v6i3.53-59>
- [61] Papanastasiou, G., Drigas, A., Skianis, C., and Lytras, M. (2020). Brain computer interface based applications for training and rehabilitation of students with neurodevelopmental disorders. A literature review. *Heliyon* 6:e04250. doi: 10.1016/j.heliyon.2020.e04250
- [62] Drigas, A. S., John Vrettaras, and Dimitris Kouremenos, 2005. “An e-learning management system for the deaf people,” *AIKED '05: Proceedings of the Fourth WSEAS International Conference on Artificial Intelligence, Knowledge Engineering Data Bases*, article number 28.
- [63] Pappas, M., Demertzi, E., Papagerasimou, Y., Koukianakis, L., Kouremenos, D., Loukidis, I. and Drigas, A. 2018. E-Learning for deaf adults from a user-centered perspective. *Education Sciences* 8(4)206:
- [64] Pappas, M., Eleftheria Demertzi, Yannis Papagerasimou, Lefteris Koukianakis, Nikitas Voukelatos, and Drigas, A. S., 2019. Cognitive Based E-Learning Design for Older Adults. *Social Sciences* 8, 1 (Jan. 2019), 6. <https://doi.org/10.3390/socsci801000>
- [65] Drigas, A. S., Lefteris Koukianakis 2009: Government online: An e-government platform to improve public administration operations and services delivery to the citizen. *WSKS (1)*, volume 5736 de *Lecture Notes in Computer Science*, 523–532. Springer,
- [66] Theodorou, P.; Drigas, A. 2017, ICTs and Music in Generic Learning Disabilities. *Int. J. Emerg. Technol. Learn.* 12(4), 101–110
- [67] Pappas, M.A., & Drigas, A.S. (2015). ICT based screening tools and etiology of dyscalculia. *International Journal of Engineering Pedagogy*, (5)3, 61-66.
- [68] Drigas, A., & Kostas, I. (2014). On Line and other ICTs Applications for teaching math in Special Education. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 2(4), pp-46. <http://dx.doi.org/10.3991/ijes.v2i4.4204>
- [69] Alexopoulou, A, Batsou, A, Drigas, A. (2019). Resilience and academic underachievement in gifted students: causes, consequences and strategic methods of prevention and intervention. *International Journal of Online and Biomedical Engineering (iJOE)*, vol. 15, no. 14, pp. 78.
- [70] Drigas, A. & Ioannidou, R. E. (2013). Special education and ICT's. *International Journal of Emerging Technologies in Learning* 8(2), 41– 47.
- [71] Drigas, A., & Papanastasiou, G. (2014). Interactive White Boards in Preschool and Primary Education. *International Journal of Online and Biomedical Engineering (iJOE)*, 10(4), 46–51. <https://doi.org/10.3991/ijoe.v10i4.3754>
- [72] Drigas, A. S. and Politi-Georgousi, S. (2019). Icts as a distinct detection approach for dyslexia screening: A contemporary view. *International Journal of Online and Biomedical Engineering (iJOE)*, 15(13):46–60.
- [73] Lizeta N. Bakola, Nikolaos D. Rizos, Drigas, A. S., 2019 “ICTs for Emotional and Social Skills Development for Children with ADHD and ASD Co-existence” *International Int. J. Emerg. Technol. Learn.*, 14(5), 122-131.
- [74] Kontostavrou, E.Z., & Drigas, A.S. (2019). The Use of Information and Communications Technology (ICT) in Gifted Students. *International Journal of Recent Contributions from Engineering, Science and IT*, 7(2), 60-67. doi:10.3991/ijes.v7i2.10815

- [75] Drigas, A. S., and Vlachou J. A., 2016. "Information and communication technologies (ICTs) and autistic spectrum disorders (ASD)," *Int. J. Recent Contrib. Eng. Sci. IT (iJES)*, vol. 4, no. 1, p. 4, <https://doi.org/10.3991/ijes.v4i1.5352>
- [76] Drigas, A. S., Koukianakis, L., Papagerasimou, Y. (2006) "An elearning environment for non-traditional students with sight disabilities.", *Frontiers in Education Conference, 36th Annual. IEEE*, p. 23-27.
- [77] Drigas A., and Koukianakis L. 2006 An open distance learning e-system to support SMEs e-enterprising. In proceeding of 5th WSEAS Internationalconference on Artificial intelligence, knowledge engineering, data bases (AIKED 2006). Spain
- [78] Drigas A, Petrova A 2014 ICTs in speech and language therapy *International Journal of Engineering Pedagogy (iJEP)* 4 (1), 49-54
- [79] Bravou V, Oikonomidou D, Drigas A, 2022 Applications of Virtual Reality for Autism Inclusion. *A review Retos* 45, 779-785
- [80] Chaidi I, Drigas A, 2022 "Parents' views Questionnaire for the education of emotions in Autism Spectrum Disorder" in a Greek context and the role of ICTs *Technium Social Sciences Journal* 33, 73-91
- [81] Chaidi I, Drigas A, 2020 Parents' Involvement in the Education of their Children with Autism: Related Research and its Results *International Journal Of Emerging Technologies In Learning (Ijet)* 15 (14)
- [82] M Karyotaki, L Bakola, A Drigas, C Skianis 2022 Women's Leadership via Digital Technology and Entrepreneurship in business and society *Technium Social Sciences Journal* 28(1), 246–252.
- [83] Bravou V, Drigas A, 2019 A contemporary view on online and web tools for students with sensory & learning disabilities *iJOE* 15(12) 97
- [84] Drigas A, Vrettaros J, Tagoulis A, Kouremenos D, 2010 Teaching a foreign language to deaf people via vodcasting & web 2.0 tools *World Summit on Knowledge Society*, 514-521
- [85] Chaidi I, Drigas A, C Karagiannidis 2021 ICT in special education *Technium Soc. Sci. J.* 23, 187
- [86] L Bakola, I Chaidi, A Drigas, C Skianis, C Karagiannidis 2022 Women with Special Educational Needs. Policies & ICT for Integration & Equality *Technium Social Sciences Journal*
- [87] M Tsakiridou, A Drigas 2022 A REVIEW OF STRESS ON STUDENTS WITH ADHD. THE ROLE OF ICTS & MENDAL INTERVENTIONS TO IMPROVE PRODUCTIVITY *Technium Sustainability* 2 (5), 39-57
- [88] H Koutsonika, A Drigas 2022 High functioning ASD profile adult employees in global labour markets. ICT supported employment *Technium Sustainability* 2 (4), 17-27
- [89] I Chaidi, A Drigas 2022 Key to Behavioral Observation of Developmental Disorders by teachers in Greek School and the role of ICTs. *Technium Social Sciences Journal* 34, 110-125
- [90] T Vouglanis, AM Driga, A Drigas 2022 Physical and mental exercise to create new congenial neurons, to increase intelligence and the role of ICTs. *Technium BioChemMed* 3 (3), 21-36
- [91] I Chaidi, A Drigas 2022 "Digital Learning: Differentiated Teaching Models using e-Twinning I COMMUNICATE WITH MY NEIGHBOR THROUGH CULTURE AND TRADITION: e - Twinning Project" *Technium Education and Humanities* 2 (3), 59-77
- [92] I Moraiti, A Fotoglou, K Dona, A Katsimperi, K Tsionakas, Z Karampatzaki, ... 2022 Assistive Technology and Internet of Things for people with ADHD *Technium Social Sciences Journal* 32, 204-222
- [93] A Fotoglou, I Moraiti, K Dona, A Katsimperi, K Tsionakas, Z Karabatzaki, ... 2022 IoT Applications help people with Autism *Technium Social Sciences Journal*, 115-130
- [94] E Karagianni, A Drigas 2022 The contribution of ICTs to the Down Syndrome Children's Language and Cognitive Development *Technium Education and Humanities* 2 (3), 19-40
- [95] M Karyotaki, A Drigas 2022 The impact of digital technologies and social networks in young women and young mother's entrepreneurship and employability *Technium Sustainability* 2 (5), 79-91
- [96] C Dimitropoulos, C Katsigera-Svoronou, A Rizou, SM Hantziara, A Hasioti, ... 2022 The Use of ICTs by Children and Young People with Mental Retardation and Syndrome Down in Domains of their Daily Life *Sustainability* 2 (5), 16-38

- [97] M Tsakiridou, A Drigas 2022 CAUSES OF STRESS ON CHILDREN WITH ADHD AND THE ROLE OF ICTS *Technium BioChemMed* 3 (3), 12-20
- [98] T Vouglanis, A Drigas 2022 The internet addiction and the impact on the cognitive, psychological and social side of people's personality with disabilities *Technium Social Sciences Journal* 35 (1), 93–110
- [99] TM Hasioti, A Drigas, D Loukeris, Z Gavriilidou 2022 Asperger Syndrome and Assistive Technologies *Technium Social Sciences Journal* 35 (1), 285–295
- [100] P Vasilakou, S Mineiko, TM Hasioti, Z Gavriilidou, A Drigas 2022 The accessibility of visually impaired people to museums and art through ICTs *Technium Social Sciences Journal* 35 (1), 263–284
- [101] T Vouglanis, A Drigas 2022 The positive impact of Internet on the cognitive, psychological and social side of people's personality with disabilities *Technium Social Sciences Journal* 35 (1), 29–42.
- [102] E Gkeka, A Drigas 2022 Ict's and Dysgraphia *Technium Social Sciences Journal* 31, 228-240
- [103] A Doulou, A Drigas 2022 Behavioral Problems and ICTs: Research and analysis in schools in Athens *Technium Social Sciences Journal* 29, 181-197
- [104] Drigas, A. S., Rodi-Eleni Ioannidou, 2013 A Review on Artificial Intelligence in Special Education, Information Systems, Elearning, and Knowledge Management *Research Communications in Computer and Information Science* Volume 278, pp 385-391, http://dx.doi.org/10.1007/978-3-642-35879-1_46
- [105] Drigas, A., Vrettaros, J. (2004): An Intelligent Tool for Building e-Learning Content-Material Using Natural Language in Digital Libraries. *WSEAS Transactions on Information Science and Applications* 5(1) 1197–1205
- [106] Drigas, A.S., Vrettaros, J., Koukianakis, L.G. and Glentzes, J.G. (2005). A Virtual Lab and e-learning system for renewable energy sources. *Int. Conf. on Educational Tech.*
- [107] Drigas AS, Argyri K, Vrettaros J (2009) Decade review (1999-2009): artificial intelligence techniques in student modeling. In: *World Summit on Knowledge Society*. Springer, pp 552–564
- [108] Vrettaros, J., Tagoulis, A., Giannopoulou, N., & Drigas, A. (2009). An empirical study on the use of Web 2.0 by Greek adult instructors in educational procedures. *World Summit on Knowledge System (WSKS)*, 49, 164-170. http://dx.doi.org/10.1007/978-3-642-04757-2_18
- [109] Drigas, A., Dourou, A. (2013). A Review on ICTs, E-Learning and Artificial Intelligence for Dyslexic's Assistance. *iJet*, 8(4), 63-67.
- [110] Anagnostopoulou, P., Alexandropoulou, V., Lorentzou, G., Lykothanasi, A., Ntaountaki, P., & Drigas, A. (2020). Artificial intelligence in autism assessment. *International Journal of Emerging Technologies in Learning*, 15(6), 95-107. <https://doi.org/10.3991/ijet.v15i06.11231>
- [111] Pappas, M., & Drigas, A. (2016). Incorporation of artificial intelligence tutoring techniques in mathematics. *International Journal of Engineering Pedagogy*, 6(4), 12–16. <https://doi.org/10.3991/ijep.v6i4.6063>
- [112] Lytra N, Drigas A 2021 STEAM education-metacognition–Specific Learning Disabilities *Scientific Electronic Archives* 14 (10)
- [113] Mitsea E, Lytra N, A Akrivopoulou, A Drigas 2020 Metacognition, Mindfulness and Robots for Autism Inclusion. *Int. J. Recent Contributions Eng. Sci. IT* 8 (2), 4-20
- [114] Chaidi E, Kefalis C, Y Papagerasimou, A Drigas 2021 Educational robotics in Primary Education. A case in Greece. *Research, Society and Development* 10 (9), e17110916371-e17110916371
- [115] S Stavridis, D Papageorgiou, Z Doulgeri 2017 Dynamical system based robotic motion generation with obstacle avoidance, *IEEE Robotics and Automation Letters* 2 (2), 712-718
- [116] T Kastritsi, D Papageorgiou, I Sarantopoulos, S Stavridis, Z Doulgeri, 2019 Guaranteed active constraints enforcement on point cloud-approximated regions for surgical applications 2019 *International Conference on Robotics and Automation (ICRA)*, 8346-8352
- [117] S Stavridis, Z Doulgeri 2018 Bimanual assembly of two parts with relative motion generation and task related optimization 2018 *IEEE/RSJ International Conference on Intelligent Robots and Systems ...*

- [118] S Stavridis, P Falco, Z Doulgeri 2020 Pick-and-place in dynamic environments with a mobile dual-arm robot equipped with distributed distance sensors IEEE-RAS 20th International Conference on Humanoid Robots (Humanoids)
- [119] D Papageorgiou, S Stavridis, C Papakonstantinou, Z Doulgeri 2021 Task geometry aware assistance for kinesthetic teaching of redundant robots IEEE/RSJ International Conference on Intelligent Robots and Systems ...
- [120] T Kastritsi, I Sarantopoulos, S Stavridis, D Papageorgiou, Z Doulgeri Manipulation of a Whole Surgical Tool Within Safe Regions Utilizing Barrier Artificial Potentials Mediterranean Conference on Medical and Biological Engineering and Computing ...
- [121] S Stavridis, D Papageorgiou, L Droukas, Z Doulgeri 2022 Bimanual crop manipulation for human-inspired robotic harvesting arXiv preprint arXiv:2209.06074
- [122] Ntaountaki P, et al 2019 Robotics in Autism Intervention. *Int. J. Recent Contributions Eng. Sci. IT* 7 (4), 4-17
- [123] Demertzi E, Voukelatos N, Papagerasimou Y, Drigas A, 2018 Online learning facilities to support coding and robotics courses for youth *International Journal of Engineering Pedagogy (iJEP)* 8 (3), 69-80
- [124] A Sideraki, A Drigas Artificial Intelligence (AI) in Autism Technium *Social Sciences Journal* 26, 262-277
- [125] M Karyotaki, A Drigas, C Skianis 2022 Chatbots as Cognitive, Educational, Advisory & Coaching Systems Technium *Social Sciences Journal* 30, 109-126
- [126] E Karagianni, A Drigas 2022 The STEM Education of Down Syndrome Children in Algorithmic and Computation Thinking for a sustainable life Technium *Sustainability* 2 (5), 58-78
- [127] S Kouloumenta, A Drigas 2022 The use of Robotics for the Development of Social Skills for Children with ASD Technium *Education and Humanities* 2 (4), 51-62
- [128] Chaidi I, Drigas A 2022 Digital games & special education Technium *Social Sciences Journal* 34, 214-236
- [129] Papanastasiou, G. P., Drigas, A. S., & Skianis, C. (2017). Serious games in preschool and primary education: Benefits and impacts on curriculum course syllabus. *International Journal of Emerging Technologies in Learning*, 12(1), 44–56. <https://doi.org/10.3991/ijet.v12i01.6065>
- [130] Kokkalia, G., Drigas, A., Economou, A., Roussos, P., & Choli, S. (2017). The use of serious games in preschool education. *International Journal of Emerging Technologies in Learning*, 12(11), 15-27. <https://doi.org/10.3991/ijet.v12i11.6991>
- [131] Drigas, A. S., and Pappas M.A. 2015 "On line and other Game-Based Learning for Mathematics." *International Journal of Online Engineering (iJOE)* (11)4, 62-67, <https://doi.org/10.3991/ijoe.v11i4.4742>
- [132] Papanastasiou, G., Drigas, A., Skianis, C., & Lytras, M. D. (2017). Serious games in K-12 education: Benefits and impacts on students with attention, memory and developmental disabilities. *Program*, 51(4), 424-440. <https://doi.org/10.1108/prog-02-2016-0020>
- [133] Drigas, A. S., & Kokkalia, G. K. (2014). ICTs in Kindergarten. *International Journal of Emerging Technologies in Learning*, 9(2). <https://doi.org/10.3991/ijet.v9i2.3278>
- [134] Doulou A, Drigas A 2022 Electronic, VR & Augmented Reality Games for Intervention in ADHD Technium *Social Sciences Journal*, 28, 159.
- [135] Kokkalia, G., Drigas, A., & Economou, A. (2016). The role of games in special preschool education. *International Journal of Emerging Technologies in Learning (iJET)*, 11(12), 30-35.
- [136] Kefalis C, Kontostavrou EZ, Drigas A, 2020 The Effects of Video Games in Memory and Attention. *Int. J. Eng. Pedagog.* 10 (1), 51-61
- [137] I Chaidi, A Drigas 2022 Digital games & special education Technium *Social Sciences Journal* 34, 214-236
- [138] G Papanastasiou, A Drigas, C Skianis 2022 Serious Games in pre-K and K-6 education. *Technium Education and Humanities* 2 (3), 1-18
- [139] V Bravou, A Drigas 2021 BCI-based games and ADHD Research, *Society and Development* 10 (4), e52410413942-e52410413942

- [140] I Chaidi, A Drigas 2022 Questionnaire of parents' opinions on digital games in the education of children with autism spectrum disorder in a Greek context *Technium Social Sciences Journal* 34, 248-270
- [141] E Karagianni, A Drigas 2022 Digital Games for Down Syndrome Children's Language and Cognitive Development *Technium Social Sciences Journal* 35 (1), 162–185
- [142] C Gatsakou, N Bardis, A Drigas 2022 The usage of RPGS as an interdisciplinary method of teaching dyslexic students *Technium Social Sciences Journal* 27, 207-216
- [143] C Gatsakou, N Bardis, A Drigas 2021 Role playing vs RPGs as teaching strategies in educational procedure *Technium Social Sciences Journal* 26, 186-193
- [144] N Doukas, N Bardis, A Drigas 2022 A Strategy Game Using Adaptive Agents and Reinforcement Learning *Technium Education and Humanities* 2 (2), 33-46
- [145] G Papanastasiou, A Drigas, C Skianis 2022 Serious Games: How do they impact special education needs children *Technium Education and Humanities* 2 (3), 41-58
- [146] Drigas, A., & Mitsea, E. (2020). The 8 Pillars of Metacognition. *International Journal of Emerging Technologies in Learning (iJET)*, 15(21), 162-178. <https://doi.org/10.3991/ijet.v15i21.14907>
- [147] Drigas, A., & Papoutsi, C. (2019). Emotional intelligence as an important asset for HR in organizations: Leaders and employees. *International Journal of Advanced Corporate Learning*, 12(1). <https://doi.org/10.3991/ijac.v12i1.9637>
- [148] Drigas, A. S., and M. Pappas, 2017. "The Consciousness-Intelligence-Knowledge Pyramid: An 8x8 Layer Model," *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, vol. 5, no.3, pp 14-25, <https://doi.org/10.3991/ijes.v5i3.7680>
- [149] Drigas A, Karyotaki M (2017) Attentional control and other executive functions. *Int J Emerg Technol Learn iJET* 12(03):219–233
- [150] Drigas A, Karyotaki M 2014. Learning Tools and Application for Cognitive Improvement. *International Journal of Engineering Pedagogy*, 4(3): 71-77. From (Retrieved on 13 May 2016)
- [151] Drigas, A., & Mitsea, E. (2021). 8 Pillars X 8 Layers Model of Metacognition: Educational Strategies, Exercises & Trainings. *International Journal of Online & Biomedical Engineering*, 17(8). <https://doi.org/10.3991/ijoe.v17i08.23563>
- [152] Drigas A., Papoutsi C. (2020). The Need for Emotional Intelligence Training Education in Critical and Stressful Situations: The Case of COVID-19. *Int. J. Recent Contrib. Eng. Sci. IT* 8(3), 20–35. [10.3991/ijes.v8i3.17235](https://doi.org/10.3991/ijes.v8i3.17235)
- [153] Drigas, A., & Mitsea, E. (2020). The Triangle of Spiritual Intelligence, Metacognition and Consciousness. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 8(1), 4-23. <https://doi.org/10.3991/ijes.v8i1.12503>
- [154] Kokkalia, G., Drigas, A. Economou, A., & Roussos, P. (2019). School readiness from kindergarten to primary school. *International Journal of Emerging Technologies in Learning*, 14(11), 4-18.
- [155] Drigas, A., & Mitsea, E. (2021). Metacognition, stress-relaxation balance & related hormones. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 9(1), 4–16. <https://doi.org/10.3991/ijes.v9i1.19623>
- [156] Pappas M, Drigas A. 2019; Computerized Training for Neuroplasticity and Cognitive Improvement. *International Journal of Engineering Pedagogy*.9(4):50-62
- [157] Papoutsi, C. and Drigas, A. (2017) Empathy and Mobile Applications. *International Journal of Interactive Mobile Technologies* 11(3). 57. <https://doi.org/10.3991/ijim.v11i3.6385>
- [158] Papoutsi, C. & Drigas, A. (2016). Games for Empathy for Social Impact. *International Journal of Engineering Pedagogy* 6(4), 36-40.
- [159] Karyotaki, M., & Drigas, A. (2015). Online and other ICT Applications for Cognitive Training and Assessment. *International Journal of Online and Biomedical Engineering*. 11(2), 36-42.
- [160] Papoutsi, C., Drigas, A., & Skianis, C. (2019). Emotional intelligence as an important asset for HR in organizations: Attitudes and working variables. *International Journal of Advanced Corporate Learning*, 12(2), 21–35. <https://doi.org/10.3991/ijac.v12i2.9620>
- [161] Chaidi I. Drigas, A. S., 2020. "Autism, Expression, and Understanding of Emotions: Literature Review," *Int. J. Online Biomed. Eng.*, vol. 16, no. 02, pp. 94–111, <https://doi.org/10.3991/ijoe.v16i02.11991>

- [162] Drigas, A. S., & Karyotaki, M. (2019). A Layered Model of Human Consciousness. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 7(3), 41- 50. <https://doi.org/10.3991/ijes.v7i3.11117>
- [163] Drigas, A. S., Karyotaki, M., & Skianis, C. (2018). An Integrated Approach to Neuro-development, Neuroplasticity and Cognitive Improvement. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 6(3), 4-18.
- [164] Karyotaki M. and Drigas, A. S., 2016. "Latest trends in problem solving assessment," *International Journal of Recent contributions from Engineering, Science & IT (iJES)*, vol. 4, no. 2, 4-10.
- [165] Mitsea E., Drigas, A. S., and Mantas P., 2021. Soft Skills & Metacognition as Inclusion Amplifiers in the 21st Century," *Int. J. Online Biomed. Eng. IJOE*, vol. 17, no. 04, Art. no. 04, <https://doi.org/10.3991/ijoe.v17i04.20567>
- [166] Angelopoulou, E. Drigas, A. (2021). Working Memory, Attention and their Relationship: A theoretical Overview. *Research. Society and Development*, 10(5), 1-8. <https://doi.org/10.33448/rsd-v10i5.15288>
- [167] Tourimpampa, A., Drigas, A., Economou, A., & Roussos, P. (2018). Perception and text comprehension. It's a matter of perception! *International Journal of Emerging Technologies in Learning (iJET)*. 13(7)
- [168] Drigas A, Mitsea E 2020 A metacognition based 8 pillars mindfulness model and training strategies. *International Journal of Recent Contributions from Engineering, Science & IT* 8(4), 4-17.
- [169] Papoutsis C, Drigas A, C Skianis 2021 Virtual and augmented reality for developing emotional intelligence skills *Int. J. Recent Contrib. Eng. Sci. IT (IJES)* 9 (3), 35-53
- [170] Kapsi S, Katsantoni S, Drigas A 2020 The Role of Sleep and Impact on Brain and Learning. *Int. J. Recent Contributions Eng. Sci. IT* 8 (3), 59-68
- [171] Drigas A, Mitsea E, Skianis C 2021 The Role of Clinical Hypnosis and VR in Special Education *International Journal of Recent Contributions from Engineering Science & IT* 9(4), 4-17.
- [172] V Galitskaya, A Drigas 2021 The importance of working memory in children with Dyscalculia and Ageometria *Scientific Electronic Archives* 14 (10)
- [173] Chaidi I, Drigas A 2020 Parents' Involvement in the Education of their Children with Autism: Related Research and its Results *International Journal Of Emerging Technologies In Learning (Ijet)* 15 (14), 194-203.
- [174] Drigas A, Mitsea E 2021 Neuro-Linguistic Programming & VR via the 8 Pillars of Metacognition X 8 Layers of Consciousness X 8 Intelligences *Technium Soc. Sci. J.* 26, 159
- [175] Drigas A, Mitsea E 2022 Conscious Breathing: a Powerful Tool for Physical & Neuropsychological Regulation. The role of Mobile Apps *Technium Social Sciences Journal* 28, 135-158
- [176] Drigas A, Mitsea E, C Skianis 2022 Clinical Hypnosis & VR, Subconscious Restructuring-Brain Rewiring & the Entanglement with the 8 Pillars of Metacognition X 8 Layers of Consciousness X 8 Intelligences. *International Journal of Online & Biomedical Engineering* 18 (1)
- [177] Drigas A, Karyotaki M 2019 Attention and its Role: Theories and Models. *International Journal of Emerging Technologies in Learning* 14 (12), 169-182
- [178] Drigas A, Karyotaki M 2019 Executive Functioning and Problem Solving: A Bidirectional Relation. *International Journal of Engineering Pedagogy (iJEP)* 9 (3)
- [179] Bamicha V, Drigas A 2022 ToM & ASD: The interconnection of Theory of Mind with the social-emotional, cognitive development of children with Autism Spectrum Disorder. The use of ICTs as an alternative ... *Technium Social Sciences Journal* 33, 42-72
- [180] Drigas A, Mitsea E, C Skianis 2022 Neuro-Linguistic Programming, Positive Psychology & VR in Special Education. *Scientific Electronic Archives* 15 (1)
- [181] Drigas A, Mitsea E, Skianis C. 2022 Virtual Reality and Metacognition Training Techniques for Learning Disabilities *SUSTAINABILITY* 14(16), 10170
- [182] Drigas A., Sideraki A. 2021 Emotional Intelligence in Autism *Technium Soc. Sci. J.* 26, 80
- [183] Drigas A, Mitsea E, Skianis C.. 2022 Subliminal Training Techniques for Cognitive, Emotional and Behavioural Balance. The role of Emerging Technologies *Technium Social Sciences Journal* 33, 164-186

- [184] Bakola L, Drigas A, 2020 Technological development process of emotional Intelligence as a therapeutic recovery implement in children with ADHD and ASD comorbidity. . International Journal of Online & Biomedical Engineering, 16(3), 75-85
- [185] Bamicha V, Drigas A, 2022 The Evolutionary Course of Theory of Mind - Factors that facilitate or inhibit its operation & the role of ICTs Technium Social Sciences Journal 30, 138-158
- [186] Mitsea E, Drigas A., C Skianis 2022 Breathing, Attention & Consciousness in Sync: The role of Breathing Training, Metacognition & Virtual Reality Technium Social Sciences Journal 29, 79-97
- [187] Drigas A, Bakola L, 2021 The 8x8 Layer Model Consciousness-Intelligence-Knowledge Pyramid, and the Platonic Perspectives International Journal of Recent Contributions from Engineering, Science & IT (iJES) 9(2) 57-72
- [188] Karyotaki M, Drigas A, 2016 Online and Other ICT-based Training Tools for Problem-solving Skills. International Journal of Emerging Technologies in Learning 11 (6)
- [189] Mitsea, E., & Drigas, A. (2019). A journey into the metacognitive learning strategies. International Journal of Online & Biomedical Engineering, 15(14). <https://doi.org/10.3991/ijoe.v15i14.11379>
- [190] Mitsea E, Drigas A, Skianis C, 2022 ICTs and Speed Learning in Special Education: High-Consciousness Training Strategies for High-Capacity Learners through Metacognition Lens Technium Soc. Sci. J. 27, 230
- [191] Drigas A, Karyotaki M, Skianis C, 2017 Success: A 9 layered-based model of giftedness International Journal of Recent Contributions from Engineering, Science & IT 5(4) 4-18
- [192] A Drigas, E Mitsea, C Skianis Intermittent Oxygen Fasting and Digital Technologies: from Antistress and Hormones Regulation to Wellbeing, Bliss and Higher Mental States BioChemMed 3 (2), 55-73
- [193] A Sideraki, A Drigas Artificial Intelligence (AI) in Autism Technium Social Sciences Journal 26, 262-277
- [194] E Mitsea, A Drigas, C Skianis Cutting-Edge Technologies in Breathwork for Learning Disabilities in Special Education Technium Social Sciences Journal 34, 136-157
- [195] A Stathopoulou, M Liouni, Y Salapata, A Drigas 2022 Emotional difficulties and post-traumatic stress disorder symptoms in children refugees & the role of ICTs: A case study in northern Greece borders Technium Social Sciences Journal 31, 213-227
- [196] V Bravou, AM Driga, A Drigas 2022 Emotion Regulation, the Function of Stress Hormones & Digital Technologies BioChemMed 3 (2), 27-34
- [197] A Drigas, E Mitsea, C Skianis Subliminal Training Techniques for Cognitive, Emotional and Behavioural Balance. The role of Emerging Technologies Technium Social Sciences Journal 33, 164-186
- [198] T Vouglanis, AM Driga, A Drigas 2022 Charismatic Children: Heredity, Environment and ICTs Technium Sustainability 2 (5), 1-15
- [199] E Mitsea, A Drigas, C Skianis 2022 Mindfulness for Anxiety Management and Happiness: The Role of VR, Metacognition, and Hormones Technium BioChemMed 3 (3), 37-52