

Evaluation of an LD learner's spelling and written expression through a non- standardized test

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Abstract: The purpose of this article is to reflect on the relevant theory related to the evaluation of a particular learner with learning difficulties (LD). In the first part, there is a short description of the LD learner's learning profile, while in the second part, there is a non-standardized test assessing the particular learner in spelling/ written expression. In the third part, there is a miscue analysis of the errors the learner made in the test. Then, in the fourth part, there is a presentation of the difficulties arising from the mistakes made in the test. Finally, there are some aims set in order to improve the learner's skill that was assessed and overcome all the difficulties he/ she may faces, followed by a conclusion, summarizing all the theoretical concepts mentioned in the previous sections.

1. Learner's profile

The particular learner (Mary) is a 9-year-old girl attending the fourth grade of a Greek private primary school. In this class, all learners (9 boys and 6 girls) are monolingual and they have been learning English since they were in the first grade of primary school. Their competence level is A1 according to the Common European Framework of Reference (2001), since they can understand short phrases around topics familiar to them, as they are introduced to literacy (reading-writing) (Gregory, 2008), while most of them seem to learn mostly through kinesthetic and visual activities and tasks (Woodward, 2001). The book taught is called '151 Incredible 5' by Express Publishing.

The assessed learner has been diagnosed with dysorthography since she was 7 years old. Regarding English as a foreign language, she shows a quite positive stance towards it and she seems to like it. However, she finds writing and spelling quite demanding, as she faces great difficulty in them and that is the reason why she skips some of her exercises when they include writing, because she understands her weakness in this skill. According to Rowe (2009), the majority of learners with LD face mostly difficulties in the written language, while Nijakowska (2010) mentioned that especially encoding (spelling) seems to be pretty demanding for them. In general, Mary is a great child with low self-esteem, she is introvert but she is always willing to cooperate with others in the class activities despite her shyness and stress (Nijakowska, 2010). Additionally, she is mostly a visual learner, as watching videos, any piece of Art and flashcards seem to help her significantly in her learning. Moreover, Mary needs further time when dealing with written activities and tasks so as to remember some spelling tricks/ mnemonics and put them into practice so as to avoid mistakes. According to Schneider & Crombie (2003), learners with LD usually have a slower processing speed and face difficulties in grammar and rules, while they have poor metacognitive skills (memory) and difficulty in managing their time (Liang & Li, 2019).

Regarding the teacher that is going to conduct the test, she has graduated from the National and Kapodistrian University of Athens and has a Master degree in Special Education. Also, she has attended a 9-month-seminar on Learning Difficulties in Aegean University. She has been teaching for 12 years, while at the same time she has taught LD classes for 2 years.

Concerning the administered test, it is a non- standardized writing test on spelling, held at school. The test lasted 20 minutes, while its topic (My family) was quite familiar to learners, as they had already done the relevant vocabulary and discussed it in class extensively. According to the assigned

test, the learner had to write a letter to her pen friend describing her family. Taking into account the learner's difficulties, the teacher made a short plan on the whiteboard on the structure she should follow so as to adapt it better to her needs and strengths and reduce the levels of her anxiety and difficulty in writing a text.

2. The Test used for the Assessment of the LD Learner

Learning a foreign language is incredibly useful and interesting for a learner, but it can be quite challenging especially for someone facing learning difficulties. Through this term, LD could actually mean various Special Education Needs (SEN), while the main types of learning difficulties are Specific Learning Disabilities, Secondary Learning Disabilities and General Learning Disabilities (Protopapas & Skaloumbakas, 2007). Generally, this term refers to numerous difficulties, such as dyslexia, dysorthography, dyscalculia, dysgraphia and dysanagnosia. According to Andreou & Segklia (2019), LD learners usually face difficulties in the TL too, since if their spelling is poor in their mother tongue it is almost certain they will face difficulties in L2 (Cummins, 1979).

Regarding testing, there are two types, that is standardized and the non-standardized testing. The first one is essential for learners' academic performance and progress (Amrein & Berliner, 2003), it is conducted under specific circumstances and it includes closed- type activities (multiple choice) leading to a specific correct answer (Osadebe, 2014). The second category of testing, the non-standardized one is an unofficial test that focuses on the evaluation of a specific skill, like the particular one. This test is criterion- referenced and it is going to assess the learner's written expression (Coelho, Ylvisaker & Tursktra, 2005). More specifically, the test will evaluate the written text and detect any possible errors (morphological, orthographic, orthographic image, phonological, capitalization, punctuation).

The transcript is the following:

Hello,

My namy is Mary. I am 10 years old. I hav got a cool family. My bab is Tom and my mam is Hellen. My bad is a polic oficer and my mam is a herdreser. We hav a lot of fan together, and we wotch many films at nite. I lov them. very mutch and I know they lav me two. On Saturdays, we hav dinna together, usually a pizza or suvlake, we lauf a lot.

Bue for now,

Mary!!

3. The Miscue Analysis

After the test, a miscue analysis is presented including a table with specific criteria evaluating the learner's written text (Jacobs, 1981). Its main purpose is to detect and evaluate learner's strengths and weaknesses and help the teacher to differentiate and adapt her teaching accordingly and prepare an effective intervention (Antoniou, 2019) so as to serve her learner's needs and boost Mary's learning self- confidence.

Regarding the written text (test), Mary seems to know and put into practice most of the grammatic, syntactic and linguistic rules. For example, she applies the subject verb object structure in every sentence ('I am 10 years old.') as English is a strict word order language, she uses tenses correctly while at the same time she knows all the necessary for her writing vocabulary. Also, she uses capital letters when necessary (Mary, I..) and she is generally aware of the morphology. However, she makes numerous spelling mistakes (hav, two) and she sometimes forgets to use the

appropriate punctuation marks (full stop or comma). The particular learner is in the transitional stage (Bailet, 1991) as she has morphological awareness and partly knowledge of spelling rules.

The following table shows the mistakes, the frequency of errors occurring and the types of errors.

Word	Morphologica l	Orth ogra phic	Orthograph ic Image	Phonological				Capitalizati on	Punctuation	Others
				S ub	O m i	A dd	Trans			
namy				x						
hav		x								
familly		x								
bab				x						
mam			x							
Polic oficer		x								
herdrese r		x								
fan			x							
wotch		x	x							
nite		x	x							
lov					x					
them.								x		
mutch			x			x				
lav		x	x							

me									x	
two			x							
dinna		x	x							
suvlake		x							x	
we								x		
lauf		x	x							
Bue			x	x						
TOTAL	0	10	10	3	1	1	0	1	3	0

4. The difficulties and the errors made

The Miscue Analysis conducted earlier showed that the most frequent errors Mary made in the test were orthographic and orthographic image.

According to Antoniou & Papakostas (2019) orthographic errors are made due to the inappropriate use of graphemes in a word, while the difficulties in memory (short/ long-term) seem to affect negatively the LD learner’s spelling (Liang & Li, 2019). In this case, Mary’s orthographic errors were the following: ‘hav’, ‘family’, ‘polic officer’, ‘herdreser’, ‘wotch’, ‘nite’, ‘lav’, ‘dinna’, ‘suvlake’ and ‘lauf’. Concerning the orthographic image errors, they mostly take place because the learner mainly focuses on specific parts of a word, usually its beginning or ending and does not see the word as a whole (Glenn & Hurley, 1994), not learning it thus properly. Some orthographic image errors made in the particular case were ‘mam’, ‘fan’, ‘wotch’, ‘nite’, ‘mutch’, ‘lav’, ‘two’, ‘dinna’, ‘Bue’ and ‘lauf’. Most of these were made because the learner visualized them incorrectly either in the mother tongue (mam/ L2- μανά/ L1) or from memorized printed images (advertisement with some kids having fun because of a fan).

Concerning the phonological errors, there are four categories: substitution, omission, insertion and transposition. The words ‘namy’, ‘bab’, ‘bue’ belong to the substitution category as some of their letters (eg. ‘e’ in the ‘namy’) are substituted by others (‘y’). Some others (‘lov’) belong to the omission category as there is a letter missing (‘lov’ without ‘e’), while finally, there is a word (‘mutch’) that belongs to the insertion/ addition category, as there is an additional not necessary letter in them (‘t’ in the word ‘mutch’).

Regarding the capitalization and punctuation errors, they did not seem to be really frequent. In some cases only, where the learner should have placed a comma after the word ‘me’ and a full stop after the word ‘suvlake’, while she shouldn’t have put a full stop after ‘them’. Finally, she should have used a capital ‘W’ in ‘we’ as a new sentence starts, so capitalization was necessary.

5. The aims for the enhancement of the skill assessed

The LD learner was capable of writing a text about her family following her teacher’s plan/ guidance. During the whole process, she seemed to be quite anxious but she tried a lot to remain focused on the task and complete it.

According to the Miscue Analysis of the learner's written text/ non-standardized test, the vast majority of errors were orthographic. For this reason, the teacher should set some goals so as to improve the learner's writing and spelling skills.

First of all, the phonetic system of the TL should be taught explicitly to the learner through a wide variety of visual and kinesthetic material that will be quite interesting to her (the intervention must focus on improving her visual storage so as to decrease the orthographic/ orthographic image errors) (Masterson & Apel, 2000), reducing at the same time the number of phonological errors occurring in her written texts and improving her spelling and phonological skills (Ganschow & Sparks, 1997).

Another crucial step would be the adjustment of the whole course to the learner's needs, strengths and weaknesses so as to boost her motivation, self- esteem and confidence. Some adaptations could be the slower pace of instruction, clear and fertile instructions and guidance for every writing stage (pre-while-post) (Gould, 1991), the assignment of more enjoyable and interesting activities, the continuous positive reinforcement and finally, creative ways of revising the already taught vocabulary or any linguistic structure (Schwarz, 1977). Overall, the teacher should always take into account her learners' interests and design, create and adjust her material according to their age, level and abilities with respect to their cultural identity.

6. Conclusion

The purpose of the particular article was to evaluate a learner with LD based on her written text, detect possible errors, analyze them and finally, set some aims in order to improve her spelling, intonation and writing skills. During the whole process, it was clear that LD learners usually face greater difficulty in spelling than learners without LD because of numerous factors. For this reason, a course of action is necessary to be put into practice for both teachers and learners (with and without LD) (Antoniou & Papakostas, 2019) so as to decrease their weaknesses, boost their strengths, contribute significantly to their better academic performance and improve the whole learning and teaching process leading them to successful L2 acquisition.

Finally, it is important to highlight the productive and effective role that digital technologies play in the education sector. These technologies, such as mobile devices (22-30), a variety of ICT applications (31-67), AI & STEM ROBOTICS (68-86), and games (87-90), facilitate and enhance educational procedures such as assessment, intervention, and learning. Additionally, the use of ICTs in conjunction with theories and models of metacognition, mindfulness, meditation, and the cultivation of emotional intelligence [91-136], as well as with environmental factors and nutrition [18-21], accelerates and improves educational practices and outcomes, particularly in language learning domain.

7. References

- [1] Amrein, A.L.M & Berliner, D.C. (2003). The effects of high-stakes testing on learner motivation and learning. *Educational leadership.*, 60 (5), 33-38.
- [2] Andreou, G., & Segkila, M. (2019). 'Cross-Linguistic Skills Transfer from the Second/Foreign Language to the First among Students with Learning Disabilities after an Intervention Program in the Second Language.' *Creative Educational*, 10/05: 1023-1036.
- [3] Antoniou, F. & Papakostas, A. (2019). Introduction to basic terminology and identification of learning disabilities. In F. Antoniou & T. Alexiou (Eds), *Learning Difficulties in English as a Foreign/International Language* (pp1-29) Patras: HOU.
- [4] Bailet, L. (1991). 'Development and disorders of spelling in the beginning school years.' In Bain, A., M., Bailet, L., L., & Moats, L. C. (Eds) *Written language disorders: Theory into practice*. Austin: TX: Pro-ed, 1-21.

- [5] Coehlo, C., Ylvisaker, M. & Turkstra, L.S. (2005). Non-standardised assessment Approaches for Individuals with Traumatic Brain Injuries. *Seminars in Speech and Language*, 26 (4), 223-241.
- [6] Council of Europe. (2001). *Common European Framework of Reference for Languages: Learning, teaching, assessment*. Cambridge: Cambridge University Press. at: www.coe.int/lang-cefr accessed 17 April 2022.
- [7] Crombie, M. & Schneider, E. (2003). *Dyslexia and Modern Foreign Languages: Gaining Success in an inclusive Context*. London: David Fulton.
- [8] Cummins, J. (1979). 'Linguistic Interdependence and the Educational Development of Bilingual Children.' *Review Of Educational Research*, 49/2: 222-251.
- [9] Glenn, P. & Hurley, S. (1993). Preventing spelling disabilities. *Child Language Teaching and Therapy*, 9, 1-12.
- [10] Jacobs, H.J et al. (1981). *Testing ESL composition: a practical approach*. Rowley, MA: Newbury House.
- [11] Liang, F. & Li, P. (2019). 'Characteristics of cognitive in children with learning difficulties.' *Translational Neuroscience*, 10/1: 141-146.
- [12] Masterson, J. & Apel, K. (2000). 'Spelling Assessment: Charting a Path to Optimal Intervention.' *Topics In Language Disorders*, 20/3: 50-65.
- [13] Nijakowska, J. (2010). *Dyslexia in the foreign language classroom*. Bristol: Multilingual Matters.
- [14] Osadebe, P. U. (2014). Standardization of test for assessment and comparing of learner's measurement. *International Education Studies*, 7 (5), 94-103.
- [15] Protopapas, A. & Skaloumbakas, C. (2007). *Software for the detection learning Skills and Weakness (LAMDA): tester's guide*. EPEAEK II, Ministry of National Education and Religious Affairs.
- [16] Rowe, S. E. (2009). Learning Disabilities and the Americans with Disabilities Act: The Conundrum of Dyslexia and Time. *The journal of the Legal Writing institute*, 15, 165-205.
- [17] Schwarz, R., L. (1997). *Learning disabilities and foreign language learning* LD Online.
- [18] 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.
- [19] Zavitsanou, A., & Drigas, A. (2021). Nutrition in mental and physical health. *Technium Soc. Sci. J.*, 23, 67.
- [20] 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>
- [21] 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
- [22] Drigas AS, Pappas MA, 2015 A review of mobile learning applications for mathematics. *International Journal of Interactive Mobile Technologies* 9 (3)
- [23] Drigas, A. S., and Angelidakis P., 'Mobile Applications within Education: An Overview of Application Paradigms in Specific Categories', *International Journal of Interactive Mobile Technologies(iJIM)*, vol. 11, no. 4, p. 17, May 2017. <https://doi.org/10.3991/ijim.v11i4.6589>
- [24] Stathopoulou, et all 2018, Mobile assessment procedures for mental health and literacy skills in education. *International Journal of Interactive Mobile Technologies*, 12(3), 21-37,
- [25] Drigas, A., Kokkalia, G. & Lytras, M. D. (2015). Mobile and Multimedia Learning in Preschool Education. *J. Mobile Multimedia*, 11(1-2), 119–133.
- [26] Kokkalia G, AS Drigas, A Economou 2016 Mobile learning for preschool education. *International Journal of Interactive Mobile Technologies* 10 (4)
- [27] Stathopoulou A, Karabatzaki Z, Tsiros D, Katsantoni S, Drigas A, 2019 Mobile apps the educational solution for autistic students in secondary education *Journal of Interactive Mobile Technologies* 13 (2), 89-101

- [28] 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
- [29] Drigas, A.S., Ioannidou, R.E., Kokkalia, G. and Lytras, M. (2014), “ICTs, mobile learning and social media to enhance learning for attention difficulties”, *Journal of Universal Computer Science*, Vol. 20 No. 10, pp. 1499-1510.
- [30] Alexopoulou A, Batsou A, Drigas A, 2020 Mobiles and cognition: The associations between mobile technology and cognitive flexibility *iJIM* 14(3) 146-156
- [31] 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.
- [32] 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
- [33] 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.
- [34] 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>
- [35] 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,
- [36] Drigas, A., Kokkalia, G., & Lytras, M. D. (2015). ICT and collaborative co-learning in preschool children who face memory difficulties. *Computers in Human Behavior*, 51, 645–651.
- [37] Drigas, A. & Kokkalia, G. 2017. ICTs and Special Education in Kindergarten. *International Journal of Emerging Technologies in Learning* 9 (4), 35–42.
- [38] 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.
- [39] A Drigas, L Koukianakis, Y Papagerasimou 2011Towards an ICT-based psychology: E-psychology *Computers in Human Behavior* 27 (4), 1416-1423
- [40] Drigas, A., Leliopoulos, P.: Business to consumer (B2C) e-commerce decade evolution. *Int. J. Knowl. Soc. Res. (IJKSR)* 4(4), 1–10 (2013)
- [41] 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.
- [42] 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>
- [43] 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>
- [44] 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
- [45] Drigas, A. S., John Vrettaros, 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.
- [46] 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:

- [47] 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>
- [48] 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,
- [49] Theodorou, P.; Drigas, A. 2017, ICTs and Music in Generic Learning Disabilities. *Int. J. Emerg. Technol. Learn.* 12(4), 101–110
- [50] Pappas, M.A., & Drigas, A.S. (2015). ICT based screening tools and etiology of dyscalculia. *International Journal of Engineering Pedagogy*, (5)3, 61-66.
- [51] 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>
- [52] 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.
- [53] Drigas, A. & Ioannidou, R. E. (2013). Special education and ICT's. *International Journal of Emerging Technologies in Learning* 8(2), 41– 47.
- [54] 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>
- [55] 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.
- [56] 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.
- [57] 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
- [58] 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>
- [59] Drigas, A. S., Koukianakis, L, Papagerasimou, Y. (2006) “An elearning environment for nontraditional students with sight disabilities.”, *Frontiers in Education Conference*, 36th Annual. IEEE, p. 23-27.
- [60] 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
- [61] Drigas A, Petrova A 2014 ICTs in speech and language therapy *International Journal of Engineering Pedagogy (iJEP)* 4 (1), 49-54
- [62] Bravou V, Oikonomidou D, Drigas A, 2022 Applications of Virtual Reality for Autism Inclusion. A review *Retos* 45, 779-785
- [63] 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
- [64] Bravou V, Drigas A, 2019 A contemporary view on online and web tools for students with sensory & learning disabilities *iJOE* 15(12) 97
- [65] 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

- [66] Chaidi I, Drigas A, C Karagiannidis 2021 ICT in special education Technium Soc. Sci. J. 23, 187
- [67] Xanthopoulou M, Kokalia G, Drigas A, 2019, Applications for Children with Autism in Preschool and Primary Education. *Int. J. Recent Contributions Eng. Sci. IT* 7 (2), 4-16
- [68] Drigas A, et all 2004 An expert system for job matching of the unemployed *Expert Systems with Applications* 26 (2), 217-224
- [69] Kefalis C and Drigas A. (2019) Web Based and Online Applications in STEM Education. *International Journal of Engineering Pedagogy (iJEP)* 9, 4 (2019), 76– 85.
- [70] Chaidi E, Kefalis C, Papagerasimou Y, Drigas, 2021, Educational robotics in Primary Education. A case in Greece, *Research, Society and Development* 10 (9), e17110916371-e17110916371
- [71] 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.*
- [72] 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
- [73] Drigas, A., Dourou, A. (2013). A Review on ICTs, E-Learning and Artificial Intelligence for Dyslexic's Assistance. *iJet*, 8(4), 63-67.
- [74] 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>
- [75] 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>
- [76] Lytra N, Drigas A 2021 STEAM education-metacognition–Specific Learning Disabilities *Scientific Electronic Archives* 14 (10)
- [77] 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
- [78] Stavridis S, D Papageorgiou, Z Doulgeri 2017 Dynamical system based robotic motion generation with obstacle avoidance, *IEEE Robotics and Automation Letters* 2 (2), 712-718
- [79] Kastritsi T, 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
- [80] Stavridis S, 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 ...*
- [81] Stavridis S, 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)*
- [82] Papageorgiou D, 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 ...*
- [83] Kastritsi T, 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 ...*
- [84] Stavridis S, D Papageorgiou, L Droukas, Z Doulgeri 2022 Bimanual crop manipulation for human-inspired robotic harvesting *arXiv preprint arXiv:2209.06074*
- [85] Ntaountaki P, et all 2019 Robotics in Autism Intervention. *Int. J. Recent Contributions Eng. Sci. IT* 7 (4), 4-17

- [86] 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
- [87] Chaidi I, Drigas A 2022 Digital games & special education *Technium Social Sciences Journal* 34, 214-236
- [88] Doulou A, Drigas A 2022 Electronic, VR & Augmented Reality Games for Intervention in ADHD *Technium Social Sciences Journal*, 28, 159.
- [89] 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.
- [90] Kefalis C, Kontostavlou EZ, Drigas A, 2020 The Effects of Video Games in Memory and Attention. *Int. J. Eng. Pedagog.* 10 (1), 51-61
- [91] 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>
- [92] 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>
- [93] Drigas A, Karyotaki M (2017) Attentional control and other executive functions. *Int J Emerg Technol Learn iJET* 12(03):219–233
- [94] 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)
- [95] 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>
- [96] 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)
- [97] 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>
- [98] 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.
- [99] Pappas M, Drigas A. 2019; Computerized Training for Neuroplasticity and Cognitive Improvement. *International Journal of Engineering Pedagogy*.9(4):50-62
- [100] 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>
- [101] Papoutsi, C. & Drigas, A. (2016). Games for Empathy for Social Impact. *International Journal of Engineering Pedagogy* 6(4), 36-40.
- [102] 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.
- [103] 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>
- [104] 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>
- [105] 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>

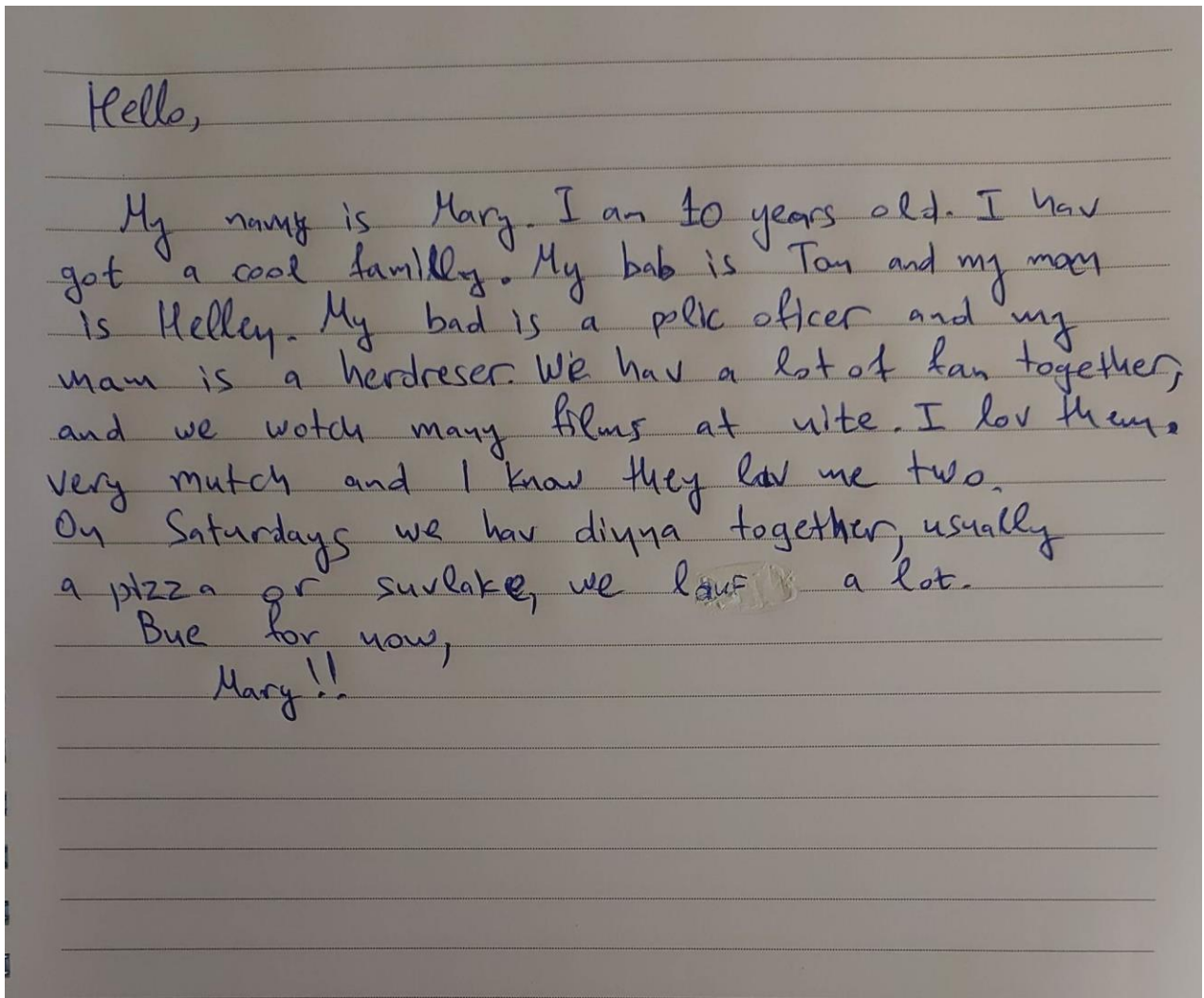
- [106] Drigas, A. S., Karyotaki, M., & Skianis, C. (2018). An Integrated Approach to Neuro-development, Neuroplasticity and Cognitive Improvement. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 6(3), 4-18.
- [107] Karyotaki M. and Drigas, A. S., 2016. "Latest trends in problem solving assessment," *International Journal of Recent contributions from Engineering, Science & IT (iJES)*, vol. 4, no. 2, 4-10.
- [108] 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>
- [109] 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>
- [110] 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)
- [111] 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.
- [112] 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
- [113] 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
- [114] 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 (iJES)* 9(4), 4-17.
- [115] V Galitskaya, A Drigas 2021 The importance of working memory in children with Dyscalculia and Ageometria *Scientific Electronic Archives* 14 (10)
- [116] 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.
- [117] 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
- [118] 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
- [119] 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 (IJOE)* 18 (1)
- [120] Drigas A, Karyotaki M 2019 Attention and its Role: Theories and Models. *International Journal of Emerging Technologies in Learning* 14 (12), 169-182
- [121] Drigas A, Karyotaki M 2019 Executive Functioning and Problem Solving: A Bidirectional Relation. *International Journal of Engineering Pedagogy (iJEP)* 9 (3)
- [122] 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 form of intervention in ASD *Technium Social Sciences Journal* 33, 42-72
- [123] Drigas A, Mitsea E, C Skianis 2022 Neuro-Linguistic Programming, Positive Psychology & VR in Special Education. *Scientific Electronic Archives* 15 (1)
- [124] Drigas A, Mitsea E, Skianis C. 2022 Virtual Reality and Metacognition Training Techniques for Learning Disabilities *SUSTAINABILITY* 14(16), 10170
- [125] Drigas A., Sideraki A. 2021 Emotional Intelligence in Autism *Technium Soc. Sci. J.* 26, 80

- [126] 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
- [127] 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
- [128] 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
- [129] Karyotaki M, Bakola L, Drigas A, Skianis C, 2022 Women's Leadership via Digital Technology and Entrepreneurship in business and society Technium Social Sciences Journal. 28(1), 246-252.
- [130] Drigas A, Bakola L, 2021The 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
- [131] 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)
- [132] Mitsea E, Drigas A., Skianis C, 2022 Breathing, Attention & Consciousness in Sync: The role of Breathing Training, Metacognition & Virtual Reality Technium Social Sciences Journal 29, 79-97
- [133] 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
- [134] 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
- [135] Drigas A, Papoutsi C, 2021,Nine Layer Pyramid Model Questionnaire for Emotional Intelligence, International Journal of Online & Biomedical Engineering 17 (7)
- [136] Drigas A, Papoutsi C, Skianis, 2021, Metacognitive and Metaemotional Training Strategies through the Nine-layer Pyramid Model of Emotional Intelligence, International Journal of Recent Contributions from Engineering, Science & IT (iJES) 9.4 58-76

APPENDICES

Appendix I: Learner's written text

Write a **short letter** to your **pen-pal** about **your family** using the plan from the whiteboard and the vocabulary taught and discussed in class (my family).



Handwritten letter on lined paper:

Hello,

My name is Mary. I am 10 years old. I have got a cool family. My dad is Tom and my mom is Kelley. My dad is a police officer and my mom is a herdreser. We have a lot of fun together, and we watch many films at nite. I love them very much and I know they love me too. On Saturdays we have dinner together, usually a pizza or sublake, we laugh a lot.

Bye for now,
Mary!!