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Chapter

Dyslexia and Academic Life

Ruth Falzon

Abstract

This chapter intends to discuss the experiences of university students with dyslexia and academic learning and assessment. It intends to challenge the traditional access to and production of examinations and to separate the ability to retrieve and produce verbal visual print from academic learning and performance in order to propose a model where educational systems join the fourth revolution. The intention is to address the brain drain that communities experience when students with Dyslexia are not able to show what they really know, due to possibly archaic access to and production of academic learning and assessment. The use of technology and independent access to printed material will also be discussed. The framework of this chapter is the Kannangara model of dyslexia: from Languishing to Thriving with Dyslexia. When reading this chapter, one also needs to remember that, whilst I refer to dyslexia, this profile more often than not co-occurs with other learning challenges and is often grouped with populations of Specific Learning Difficulties or Learning Disabilities in research and national data.

Keywords: academic success, access to academic learning, formal assessment, Dyslexia, Learning Disabilities, specific learning difficulties

1. Introduction

In April 2014 [1] Maltese educational psychologist Mr Juan Camilleri and I tabled a petition with the Parliament of Malta. We recommended the use of alternative access to and production of literacy for national academic examinations and throughout education. At the time, the Rector of the University of Malta (UM) refused to accept the petition, which is why we then tabled it with the Parliament of Malta. Since then, significant changes at the UM and the Ministry for Education and Employment indicate that Malta has started to embrace the rationale of this petition [2]. Notwithstanding, I think that there is still long way to go both locally and globally, particularly with reference to attitudes within the academic world. In spite of literature affirming that the ability to read and intelligence are not correlated [3, 4], people with dyslexia still experience being looked down upon by educators and fellow students due to their challenges with literacy (e.g., [5–7]). This chapter will discuss experiences of university students with dyslexia and suggest possible strategies that can be considered, also in the context of the present health situation. This chapter embraces Kannangara's [8] model From Languishing to Thriving Dyslexia.

To start, I will share the experience of an academic I heard speak during an international conference I attended in 2015. She used to work in a University in Europe. She had been working at this university for over 25 years and had always received positive feedback and evaluation reports about her lecturing, research,

administration, co-ordination and research. She had never felt the need to disclose her profile of dyslexia. However, one day she mentioned her profile en passant during a meeting with University academic and administration. From that day on, the university started asking her to recheck her work, her work started to be supervised; and she was given the message that the university had concerns about her profile. The situation was so stressful for her that it became untenable and she actually had to leave her place of work. It seems that, after 25 years of sterling service to her university, the main focus became her profile rather than her actual sterling output and track record.

2. Personal worldview on literacy, dyslexia definition and intervention

At the outset, I would like to declare that one cannot diminish the extreme importance of reading and spelling skills and techniques. Globalisation is placing new demands on the kinds of literacies we need both in our work and in the daily demands of everyday life. A good quality basic education equips one with literacy skills for life and further learning. In most developed and developing countries, literacy skills are fundamental to daily living and affect the social, political, civic, economic and personal lives of citizens, directly affecting wellbeing [8]. Where literacy still does not have a fundamental function, oppression and poverty prevail [9–11]. Johnson and Kress [12] noted that "globalization is frequently thought about in economic terms alone, but there is equally a cultural globalization which is no less, maybe even more, potent in its shaping to the ways in which we communicate and represent meaning" (p. 5).

Literacy is regarded as a means to address poverty and oppression (e.g., [9, 13–15]). The post-war era has seen literacy on nations' educational, economic and political agendas (e.g., [15–17]). The United Nations' Educational, Scientific and Cultural Organisation (UNESCO) perceives literacy as a human right, a tool of personal empowerment, a means for social and human development, and at the heart of basic education for all [15]. The UNESCO Education for All (EFA) committee noted that eradicating poverty, reducing child mortality, addressing population growth, achieving gender equality and ensuring sustainable development, peace, democracy and empowerment are some of the good reasons why literacy is at EFA's core [15]. Indeed, since its foundation in 1946, UNESCO has been at the forefront of global literacy efforts and is dedicated to keeping literacy high on national, regional and international agendas [18].

2.1 Literacy?

Hirsch [19] proposed that failing to teach children what they must learn in order to be able to cope with further learning in school is the greatest form of injustice in education which can be prevented. What I challenge is what is regarded as a must to learn and how one defines literacy.

The literature is clear. Access to the printed text paves the way for learning and economic growth and justifies ensuring that young learners learn to read as early and as expediently as possible (e.g., [9, 20, 21]). The speed and effectiveness of this early literacy learning process affects success in learning and has a Matthew Effect (e.g., [22–24]). However, education needs to include those for whom learning to read is not so easy. Pedagogies need to embrace this and must use teaching strategies which include media other than the printed text to access learning, particularly in a context where technology is the reality of the day.

There is consensus that the ultimate purpose of reading printed text is to understand its meaning [25]. Research indicates that slow and effortful word-decoding/

word-recognition abilities limit reading comprehension abilities (e.g., [4, 26, 27]) and affect academic success [28], with success depending on the ability to read and write [29]. I simply want my dream to become a reality for all: "for whom reading and writing is not such an easy task or choice, alternatives for access to medium and expression of knowledge should be available so long as the aims and objectives of examinations are not compromised" ([1], p. 1).

Children and young people with dyslexia and other challenges are failing their national examinations due to access to medium and choice of medium of expression [30]. This is not only disheartening for the individual, but also a brain drain on communities, impacting the economy and wellbeing of families, communities and countries [31]. Education still needs to understand the need to teach all our children how to read and write, whilst at the same time addressing the need of access to learning without the use of the verbal visual [32, 33].

Literature clearly evidences the negative effects challenges with literacy have on the wellbeing of persons with dyslexia (e.g. [34–37]). Educational systems and educators must avoid unnecessary suffering by challenging their definition of learning and performance in examinations [30, 38]. Inasmuch as literacy must be given priority in education, for those with neurological challenges to access it, technology needs to be used as a compensatory strategy and a tool [39].

2.1.1 Reading comprehension

Reading comprehension is the ability to actively understand ideas and integrate them with prior knowledge to create efficient memory structures [28]. Since it is one of the most complex human activities, any reading theory must address underlying cognitive and linguistic processes involved in comprehension [40]. According to the Single View of Reading (SVR) model, linguistic comprehension contributes to reading comprehension [40] as does accurate and efficient word decoding/recognition [26]. Florit and Cain's [41] meta-analysis concluded that linguistic comprehension is a strong predictor of reading comprehension in transparent orthographies [e.g.,Finnish) whilst word decoding skills were more influential in deep orthographies [e.g.,English). Other researchers oppose this model, referring to more complexities.

For example, the Direct and Indirect Effects of Text Comprehension Model refers to relational pathway between lower- and higher-level skills involved in reading comprehension [42]. Lower-level skills include working memory, attention, vocabulary and grammatical knowledge, oral language [42] which are necessary to address higher-level skills such as inferences, perspective taking, comprehension monitoring, verbal working memory, and knowledge on text structures (e.g., [43–45]). Motivation, interest and purpose are then additional contributing factors [46].

My reflection on these two models' sets of skills needed for reading comprehension is that for all the skills required, effective and fluent word recognition are skills which can be replaced by technology, whilst the other skills can still be developed and addressed so that readers interact and involve themselves with written language to extract and construct new meaning.

2.1.2 Beyond traditional literacy

The theory of this chapter is that, wherever possible and so long as the academic learning and assessment objectives are retained, one should be allowed to choose whether, in light of their profile of abilities, skills and challenges, they would prefer to learn, study, access knowledge, develop skills and sit for their examinations

orally, using the voice to produce printed material for examiners to read, in handwritten format or using the word processor/tablet. This should be regarded as a choice for all, rather than an examination access arrangement; in the same way that one chooses to sit for examinations using their prescriptive glasses or writing with blue or black pens.

Let us take the subject of History as an example. The aims and objectives of the History curricula and syllabi, as well as its content, never indicate that reading and writing per se are required. Why is it then such an issue and such a waste of human and financial resources for our system and for families to conclude whether candidates should sit for History orally, in typewritten format or handwritten format? One may query: but what about language examination? In my opinion, the same rationale can apply as the knowledge of knowing a language and being able to produce material for others to read is different from the ability to read and spell. Therefore, unless the examination objective is specifically the skills of decoding or encoding or the skill of producing written material through handwriting, the same rationale applies.

2.1.3 Writing (??) an essay

In dictionaries, an essay is usually defined as a "short literary composition on a particular theme or subject, usually in prose and generally analytic, speculative, or interpretative" ([47], para.1). No definition on the word essay includes that this task must have been written, typed, swiped or dictated. As such, it is perhaps about time that the ability to spin a yarn or present a thesis for others to read in another space and time is differentiated from the ability to spell, particularly in the context of modern technology. Essays can be produced using two (swiping), three (hand-writing), ten (typing) fingers or no (voice-activated technology) fingers. This is not to diminish the importance of spelling, but simply to do justice to competencies required to produce essays. One would need a good speller to proofread documents. This is different from the ability to transform thoughts, creativity, theories, arguments and ideas into readable linguistic communication for others to access in another time and space. Does one ever question or reflect upon the spelling ability of great authors? Is the spelling of authors ever criticised or addressed when books/ articles/ scientific journals are published?

2.1.4 Technological support to literacy learning and proficiency

Research findings consistently conclude that early literacy learning affects success in learning (e.g. [22, 23, 48]). It is therefore of utmost importance that early education also includes the use of technology to access and present print for those struggling with literacy (e.g., [49–51]) as pupils are learning to break the code to literacy. Standard computers themselves already incorporate adaptations to address all aspects of literacy [52]. Free downloadable material (e.g., [53–55]) allows one to add applications. The market also has commercial affordable apparata which not only provide text-to-speech and speech-to-text but also present organisation features for general (e.g., [56–58]) or examination use [59, 60].

2.2 Dyslexia definition and intervention

Any research in this area is complicated by difficulties defining dyslexia. Most agree that dyslexia involves reading ability below age- and IQ-matched peers, which is not attributable to poor visual or auditory acuity or inadequate instruction; and where intellect is not affected by specific challenges attributed to this profile

(e.g., [4, 61, 62]). Research findings, mostly quantitative, seem to indicate that dyslexia can be categorised into five challenged areas of brain function: phonological, visual, memory, semantic and kinaesthetic (e.g. [4, 61, 63]), where effects continue throughout lifetimes (e.g., [62, 64, 65]). However, there is still considerable debate in education and neuroscience literature regarding underlying causes, age distribution, diagnosis, identification, appropriate assessment methods and intervention (e.g., [66–68]).

The Guardian [69] lately presented a long article on whether dyslexia actually exists. Citing challenging literature that states that distinguishing between dyslexia and other reading difficulties results in children not being eligible for intervention [70]. Kale [69] referred to Yule's (1976) conclusion that:

> *The era of applying the label 'dyslexic' is rapidly drawing to a close. The label has served its function in drawing attention to children who have great difficulty in mastering the arts of reading, writing and spelling but its continued use invokes emotions which often prevent rational discussion and scientific investigation. (p. 166)*

Whilst I agree that (1) terminology and diagnostic conclusions should not deter access to intervention; (2) one should focus on behaviour, skills and abilities rather than labelling; (3) Intervention techniques designed for the dyslexia population are inclusive strategies and beneficial for all, I disagree with Yale. Ample research findings evidence this established neurological profile which, more often than not, co-occurs with other neurological profiles [71]. Apart from educational and psychological research on dyslexia, neuroscience research is leading to a deeper understanding of the identification, diagnosis and management of dyslexia. Such hard evidence provides for strong and persuasive lobbying for change [3, 4].

Snowling et al. [4] acknowledged challenges with co-occurrence and cut-offs and concluded that "Optimal outcomes for these children require us to embrace the dimensional nature of dyslexia and its associated complexities; to fail to do so is negligent and arguably morally indefensible" (p. 508). Lastly, knowledge about dyslexia may benefit all those who present challenges learning to read, whether they have a profile of dyslexia or not (e.g., [9, 20, 71]).

My views regarding learning and examination access arrangement as a choice-for-all rather than a concession for some, clearly presents that my framework and worldview is framed within principles of inclusion [72], diversity [73, 74] and otherness [75, 76]. This echoes Furedi's [77] resistance to the use of a diagnosis disability and pathologisation to justify allowances and additional support. Further, I frame dyslexia within Kannangara's [8] (2015) From Languishing to Thriving Dyslexia model, which lobbies for support, understanding and resilience.

3. Academic self-concept and academic success

Zeleke's [78] and Burden's [35] meta-analyses concluded that academic self-esteem and self-concept (ASC) are founded early and tend to be very stable and rather unaffected by later, more successful experiences. This then affects choices for further education, as is represented by data available regarding university students and research findings. Burden [35] reflected that values regarding, "how competent we think we are, ...how much in control of the outcomes we consider ourselves to be...[how] we react to disappointment and failure, the strategies that we have... effort we are prepared to invest in order to succeed,"(p. 20) affect ASC.

Therefore, it can be assumed that studies available on dyslexic university students would involve a particular dyslexic population which would have enough required

abilities and skills to have enabled them to build ASC allowing them to remain resilient and motivated to learn and who, perhaps, were in supportive home environments and school systems [8, 30]. The question that lingers is: what brain drain are our communities experiencing because school environments lead students to low ASC?

Research findings consistently suggest that teachers and lecturers fail to understand the complexities related to dyslexia and other learning challenges (e.g., [79–81]). They tend to perceive dyslexia as similar to other learning difficulties [82] and are less likely to account for students' abilities [81]. Lack of understanding and adequate appropriate support may lead to students not completing their studies or graduating with inferior degree classifications than deserved. Caskey's [83] Australian research identified that adult dyslexics tend to live in a "dual world, one that is related to the Medical versus Social Model of Disability. Despite the research on 'ableism' …adult students diagnosed with dyslexia were navigating through the system barriers searching for support, between the inclusion and exclusion zones" (p. 264). However, when "advocate, support and services were provided…in the form of advocacy, success can occur" ([83], p. 266).

Kannangara [8] concluded that experiences can present a model where one can either languish or thrive with a profile of dyslexia. She reported that, a thriving dyslexic presents positive acceptance towards challenges, embraces difficulties, uses signature strengths to address obstacles, learns from criticisms, perseveres, withstands, and finds alternative approaches to address failures. Unfortunately, a 2019 report [84] by the British Dyslexia Association (BDA) evidenced that parents reported the following effects of a profile of dyslexia on their children: 82% try to hide their struggles; 88% experience poor self-esteem, 84% suffer from anxiety; 52% try to avoid school; 78% feel embarrassed; 48% had been bullied, 95% experience frustration, 58% avoid discussing their dyslexia, and 82% try to hide their difficulties relating to dyslexia.

BDA [84] concluded that "children and young people are uncomfortable, and experience negative emotions linked to their dyslexia …our data may demonstrate an association between dyslexia and mental health difficulties" (p. 19).

Studies exploring school experiences through interviews offer an overall experience of strong, negative emotions (e.g., [34, 85, 86]). Studies exploring how dyslexic people make sense of their positive and negative emotions in relation to school experiences have also presented positive experience (e.g., [8, 87, 88]). One needs to, however, take into consideration that some of the participants of such studies were students attending specialised schools (e.g. [35, 88, 89]). Hellendoorn and Ruijssenaars [90] interviewed 27 dyslexic adults, 8 of whom had negative, 11 mixed and 8 positive experiences. Hughes and Dawson [86] interviewed 54 dyslexic adults. Just over half said they mostly disliked school. Riddick et al. [91] interviewed 16 dyslexic students in higher education, of whom only three reported overall positive experiences. Though none of these studies claim to be representative of the whole population of dyslexic people, they suggest that from one third to one half of dyslexic adults may remember school in primarily negative terms.

4. The highest echelon of university assessment

Currently, the highest level of global academic examination is Doctorate of Philosophy (PhD), for which most university use oral examination (viva voce) (e.g. [92–94]). Doctorate examination boards do not question, query, consider or ask for verification whether the verbal-visual 80,000–120,000 word PhD document has been handwritten, typewritten, dictated to a secretary, or produced through assisted technology. The Board of Examiners simply accepts the PhD Document,

as this would still the candidate's work irrespective of the process of the medium of expression. On the other hand, examiners may choose to read the work in the traditional format or use assisted technology to listen to the document. The conundrum is: why it is then not so easy for students in compulsory or university education to be given such choices? Rather an oxymoron!

Examinations at critical stages in students' education are becoming increasingly more high stakes [38, 95]. They provide students with necessary qualifications for further education or employment [96]. They therefore have a significant impact on students' life chances and opportunities [97], thus dominating students' lives and school experiences, further influencing future plans affecting life styles (e.g., no time for extracurricular activities) due to the constant pressure to do well [96, 97]. This of course applies to all students but may be more stressful for those with a profile of dyslexia (e.g., [8, 34, 89]).

5. The examination experience

Research findings clearly indicate that examinations have an impact on all students' lives (e.g., [98–100]). However, "the effects of examinations may be magnified for those who enter the process already labouring under a disadvantage" ([101] p. 8). Research findings consistently conclude that dyslexic students experience greater challenges than non-dyslexic students when sitting for examinations. These challenges include reading fluency and accuracy, auditory sequential short-term memory, sequencing, and organisation of ideas that all impact on the performance of students in examinations (e.g., [102–104]).

The lack of scientific consensus about what dyslexia really is leads examination boards to query this profile [4]. Crisp et al. [102] lamented that assessment communities have continued to persist that difficulties and challenges students with dyslexia face are similar to students with weak reading abilities or lower cognitive skills. Chetcuti et al. [38] presented the voices of young people with dyslexia and concluded that the participants shared their "frustrations, anxieties and hopes for a fairer examinations system" (p. 445). To address equity, fair play and wellbeing, dyslexic youth in the Chetcuti et al. [39] research perceived a need for radical transformations of examination systems and implored for participatory justice [105, 106], where they should "participate meaningfully throughout the decision-making processes" ([107], p. 346). Hence, my argument to switch to choice rather than examination concessions.

6. University students with dyslexia - crunching numbers

Whilst it is generally accepted that dyslexia affects 10–15% of the general population (e.g., [3, 108, 109]), research evidences underrepresentation at universities. For example, Richardson and Wydell [110] reported 0.48% British-based; and Stampoltzis and Polychronopoulou [111] 0.16% Greek University Students noting reading difficulties. Further, during academic year 2019–2020, out of 11,117 students attending the UM, only 201 (1.18%) students registered with its Access Disability Support Unit (ADSU). Of these, seven (0.06%) described themselves as Specific Learning Difficulties/Learning Difficulties, six as dyscalculic (0.05%) and 36 (0.33%) as dyslexic.[1]

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[1] September 2020 e-mails' correspondence with ADSU official Ms Marchita Mangiafico and ADSU chair Dr Anne-Marie Callus.

Richardson and Wydell [110] reported that their analysis of databases of students in British higher education evidenced 0.46% in 1995–1996 and 1.51% by 2000-to 2001. Mortimore and Crozier' [112] reported that between 1999 and 2010, British University students with dyslexia or Specific Learning Difficulties almost quadrupled: from 8370 to 32,655. Richardson [113] reported that the situation continued to improve, as in 2013–2014, 37,710 students with dyslexia or other specific learning difficulties (4.97% of all freshers) were admitted to their first year of study. Likewise, UM reported an increase of students requesting examination access arrangements for national examinations: from 1.6% in 2004 to 10.9% in 2019 [114]. This may mean that most Maltese University Students do not inform UM of their profile and do not utilise any possible learning and examination arrangements. This needs further research.

Richardson [113] reflected that "the increase in the prevalence of dyslexia amongst students in UK higher education may reflect changes in diagnostic procedures, public awareness and admissions policies" (p. 325) and the need for more flexible admission policies by institutions of higher education. Likewise, Olofsson et al. [115] reported that "there are now more students with dyslexia in [Swedish] university courses, in both actual and proportional numbers, from 3634 (1.2%) in 2009 to 5457 (about 1.9%) in 2013" (p. 338). They attributed this increase to four factors: (1) earlier identification and provision; (2) financial and other support in higher education; (3) wider access for older students, thus including those who had performed poorly at school because of undetected dyslexia; and (4) the adoption of more flexible university admissions policies.

6.1 Higher education success

Although the literature is limited, studies seem to indicate that success in higher education is "not impossible for students with dyslexia but may be more difficult" ([116], p. 3). Olofsson et al. [115] reported that around 20% Swedish university students with dyslexia required additional time to complete their degrees, whilst others were able to progress at a normal pace. Richardson and Wydell [110] reported that approximately 40% UK dyslexic graduates obtained first-class or upper second-class honours. This was, however, lower than the 50% rate for graduates with no reported disabilities. Mortimore and Crozier's [112] study across 17 higher education institutions also concluded challenges with academic skills, higher risk of either discontinuing or acquiring inferior degrees due to a lack of appropriate support. Byrne [117] further noted that, whilst the proportion of British university dyslexic students has lately increased to around 5%, a significant attainment gap remains, as only "around 40% of dyslexic students achieve a 2.1 or above, compared to 52% of non-dyslexic students" (para. 2). Richardson and Wydell [110] used a 1995–1996 British higher education database and discovered that it was more common among students with dyslexia than among other students to either abandon their studies in the first year of study or not finish their study programmes.

This is happening in spite of enshrined university legislations stressing that educational access is moral and humanitarian imperative (e.g., [2, 118, 119]). One also needs to take into considerations that such statistics include students who declare and know that they have such a profile. One then wonders how many more may be university students without awareness of, or fear of disclosing, their profile of dyslexia. Notwithstanding, we still need to take heed of these data as it is "important to identify factors that could contribute to poor representation and experiences of dyslexic students in higher education and seek appropriate solutions" ([116], p. 3).

Despite vast knowledge and conclusive findings, this population continues to struggle to achieve and maintain success. While enrolment in post-secondary

institutions has increased [120], the dropout rate, unemployment rate, more placement in lower prestige jobs, lower income and poverty remain high [121].

7. The university experience

Research on dyslexia and university students also presents challenging experiences. For example, Denhart [5] reported that her participants' "three [main] findings [were] inextricably bound with the reluctance to ask for accommodations: (a) an overwhelming workload that is (b) unrecognized and (c) yields products incommensurate with the effort (p. 493)". Additionally, Lock and Layton's [6] participants and Rodis et al.'s [7] autobiographical accounts presented experiences where lecturers perceived dyslexic university students as lazy or lacking effort, also because lecturers were not aware of students' profiles [122]. Rodis et al. [7] and Greenbaum et al. [123] reported that their participants' fear of stigma was worse than others' perceptions of laziness or lack of motivation, even if this led to exhaustion and illness. Further, these participants also regarded the use of accommodations as a failure. This highlights that "the finest accommodations based on the most sophisticated science will have no value if intolerance denies their use" [5], p. 495.

Most research on dyslexia and higher education addresses diagnosis, cognitive abilities, compensation strategies and study techniques (e.g., [124–126]). Less research has been directed towards students' own experiences of inclusion in higher education [38, 127]. Olofsson et al. [115] reported that in 2011, Swedish researcher Eriksson Gustavsson carried out a study with 186 students with dyslexia attending six Swedish higher education six institutions. Gustavsson reported that the rate of study of most students was lower than expected, but only few had an extremely slow rate of study. Further, limited achievements had occurred early on in their studies.

Olofsson et al. [115] carried out a study with 50 Swedish students with dyslexia using semi-structured interviews and a self-report scale. Their participants reported that reading course books in English (not their mother tongue) and taking notes during lessons were the two most challenging tasks. They felt less challenges when textbooks were in Swedish, and with spelling and written assignments. Half rated themselves as good and slightly more than 10% as particularly good with regard to reading and understanding textbooks in Swedish, whilst their confidence in spelling was less good. On the other hand, 90% rated their ability to find information on Google or other sites on the Internet as good (46%) or very good (44%), whilst 88%, rated their ability to find what they look for on the Internet as good (52%) or very good (36%). Regarding the continuation and completing of a university degree, Olofsson et al. [115] reported that this depended on the students' rate of study. They concluded that about half:

> Manage[d] pretty well despite their reading and writing problems. The mean rate of study for the dyslexic students in the present study was just below the national baseline. However, it should be noted that one-fifth of the dyslexic students have a very low rate of study and will thus need special attention from their teachers. The dyslexic students' mistrust in their own abilities in reading course books and articles in English and in taking notes should be taken into consideration in the development of support systems for students with dyslexia. (p. 347)

7.1 Successful graduates

British and Maltese bachelor's degrees are classified as first, second-upper, second-lower or third class. A first-class or second-upper class is often described as a good degree. Richardson and Wydell [110] found that 53.6% of students with

no disability and 43.9% of students with dyslexia were awarded good degrees. The difference in these proportions was rated highly significant, even when possible effects of demographic and programme-related variables were considered. However, data on detailed accounts of students with dyslexia's higher education academic attainment are difficult because national statistics are not collected about other academic outcomes, since many do not disclose their profile, because of description of profile, and due to co-occurrence.

Pino and Mortari's [127] systematic review of published studies on inclusion of students with dyslexia in higher education identified 15, mostly qualitative, studies. They concluded that, whilst valuable information for support services was presented, there was no evidence on attainment. Richardson and Wydell [110] reported that whilst they were aware that the British Open University is known for attracting students with dyslexia, perhaps due to its option for distance learning, they unfortunately had to exclude Open University students from a more detailed analysis because many had been omitted from the database. Richardson and Wydell [110] had concluded that students with dyslexia who had taken undergraduate modules in 2003 with the British Open University were as likely as were nondisabled students to complete their modules. However, they were more likely to obtain poorer grades. A problem with the study was that they were concerned only with students with dyslexia and no other disabilities. They in fact omitted students with dyslexia and additional disabilities from their sample. This is problematic, especially with the conclusion that co-occurrence with other profiles is now considered the norm, exception [71].

7.2 Cognitive skills and university learning and performance

Further to the context of co-occurrence [71], one needs to consider that a profile of dyslexia does not merely involve challenges to access literacy. Such a profile may also include difficulties organising essays, timekeeping, expressing ideas verbally, concentrating and using short-term memory, listening and organisation (e.g., [4, 112, 115]). For example, Simmons and Singleton [128] concluded that dyslexic university students experience challenges drawing inferences from complex texts. They, however, did not specify if alternative access to verbal visual print would have affected such results. This is supported by conclusions that reading characteristics vary widely between students [129].

Studies on writing skills conclude that dyslexic university students present particular challenges with spelling (e.g., [124, 130, 131]), overall written text quality [130, 131], number of words written [132], organisation [112], and vocabulary chosen [132]. On the other hand, comparative differences between university students with or without dyslexia indicate no significant differences in sentence structure, length of sentences [132], expression of ideas or other higher order skills [130]. These findings indicate that such students can cope with university learning, if given the chance, the appropriate support, and with training for university academic [83, 117]. As one youth shared: "I wonder how many great minds were lost simply because the type of intelligence [, access,] and ideas they had were not the the examiners wanted" ([38], p. 439).

Often, these studies refer to challenges experienced using traditional access and presentation of verbal visual print. Therefore, there is a dearth in the literature for one to conclude whether one would experience such challenges if technology were to be used. This is similar to literature available regarding foreign language learning. For example, the British Dyslexia Association (BDA) promotes [133] that "dyslexic children should be given the opportunity to learn a foreign language. Many ...will enjoy the multi-sensory methods of language teaching ...Learning a foreign language

broadens pupils' horizons as their awareness of other cultures develops" ([133], para. 1). However, BDA also seems to be chained by traditional access to literacy and pedagogy for foreign language teaching, as it suggests that, "Some languages may be more problematic for dyslexic learners. Languages such as French and English are less transparent than other languages" ([133], para. 2). In a context where (a) the literature clearly concludes that foreign language learning and bilingualism has a positive effect on general cognitive development (e.g., [134–136]); and (b) the EU requires all its citizens to be tri-lingual [137], there seems to be the practice to discourage persons with dyslexia to learn a foreign language. Contrastingly, I have to date not found any literature (written in Maltese, English or Italian) to support this myth.

8. The lived experience

Literature addressing day-to-day experiences of university students with dyslexia is dearth. Whilst there is a considerable body of literature exploring overall university experiences of students with a broad range of disabilities, including students with dyslexia (e.g., [138–140]), such studies tend to focus on physical access, social stigma, reasonable adjustments (e.g., [138, 141, 142]). Further, findings regarding dyslexic students are difficult to differentiate from other findings of these studies.

Research available addressing experiences (e.g. [115, 116, 127]) evidences challenges, difficulties and frustration. Participants reported difficulties with notetaking, reading journal articles and course books, technology, accessibility and adjustments. These studies seem to indicate that some students, "will overcome these difficulties, [but] the additional effort may lead to greater frustration and lower completion rates than might otherwise be expected" ([116], p. 16). Further, MacCullagh et al. [116] rightly acknowledged that disadvantages may include, "insufficient time to research topics broadly, difficulty balancing paid work and other responsibilities, mental health risks of overwork and less time to participate in social, sporting, artistic and other extra-curricular activities" (p. 16).

Pino and Mortari [127] conducted a systematic review of published research on the university experiences of students with dyslexia and reported finding 15 relevant studies. They synthesised the findings in five key themes: (1) Coping strategies (Study skills and Compensatory Strategies); (2) Profile identification; (3) Interaction with academic staff; (4) Accessibility and adjustments to learning and assessment; and (5) Use of technologies.

Helpful study skills included making notes from books, accessing materials in multiple formats, colour coding, concept mapping and discussing ideas verbally. Compensatory strategies included downloading slides prior to lectures, obtaining copies of lecture notes, lecture recordings help from family and friends, meta-cognitive skills included time planning, graphic organisation of information and meta-affective skills.

Notwithstanding, Pino and Mortari [127] concluded gaps in the literature, particularly regarding strategies for improvement. The available research findings also report difficulties identifying main ideas in text, preparing for tests [126], reading course books and taking notes [143]. Again, one needs further exploration regarding the use of technology as such studies sometimes do not differentiate between traditional reading and reading using technology. For example, Olofsson et al. [143] reported additional information from the internet as a key compensatory strategy; whilst Kirby et al. [126] reported study aids, time management strategies and deep learning approaches as key compensatory strategies. More research exploring study practices and opportunities for support is needed.

MacCullagh et al.'s [116] semi-structured interviews based on best practice methodologies yielded similar data to literature (e.g., [115, 126, 127]). Findings concluded positive themes such as appreciation for engaging speaking style, flexible lecture formats, deep engagement with learning tasks and self-directed learning. Further, students with dyslexia "reported spending a great deal of effort on learning tasks. Participants with dyslexia described engaging with learning tasks intensively and frequently, using multiple strategies. Possible advantages of this effort could include deeper learning and development of creative problem-solving skills" ([116], p. 16). It is interesting that such behaviours [144] are highly sought after in workplaces (e.g. [145–147]). Further, such characteristics are also helpful for all students (e.g. [148–150]).

Disadvantages also include insufficient time to research topics broadly, difficulty balancing paid work and other responsibilities, mental health risks of overwork, and less time to participate in extra-curricular and social activities. These findings add to moral and legal justifications for understanding rather than judging profile of university students with dyslexia. Future research in this area could focus on number of hours per week spent on learning tasks. MacCullagh et al. [116] also discussed that the very coping learning strategy these individuals use are strategies which actually lead to deeper learning and memory. One also needs to consider that such individuals would probably be more highly motivated to be university students, given that they keep striving despite challenges. Additionally, they would most probably have the necessary support system which led them to thrive in, rather than languish for, higher education [8].

Also noteworthy was the strong appreciation among students with dyslexia for face-to-face lectures and for recorded lectures that included a video of the lecturer's face. This is particularly important considering recent trends in the higher education sector towards partially and wholly online courses. Such changes must be critically appraised to prevent compounding disadvantages for students with dyslexia. It may be important to continue offering some face-to-face lectures, and to ensure that recorded lectures include a video of the lecturer talking. This is extremely relevant and important in the current health challenges humans are experiencing. The question would be: how can we find a technological alternative to address the participants' recommended face-to-face intervention?

9. University support services

Studies addressing use of services indicate a strong uptake for resources such as additional time in examinations, dyslexia-support tutors and information technology assistance [112, 143]. Other services include appropriately skilled note-takers, lecture slides in advance, support with organisation and support with academic writing (e.g., [38, 112, 143]).

However, international data consistently reports poor uptake of support services by students with dyslexia. Reasons include poor awareness of services, poor suitability of services and non-disclosure. Most services seem to be designed for people with low vision, illiteracy, general learning disabilities or physical disabilities, rather than students with dyslexia per se. New services may therefore need to be designed specifically for students with dyslexia or existing services tailored to specific needs as identified by students themselves. For example, students suggest dyslexia-specific tutoring and tailored note-taking services (e.g., [112, 143, 151]).

Research findings on appropriate, satisfying and effective support and strategies are consistent with current best practices on inclusive design and accessibility standards [152]. For example, findings of appreciation for videos, images and

face-to-face teaching support the efficacy of multi-modal or multi-sensory teaching for dyslexic learners. This reflects current research and best practice where all learners generally benefit from having information presented in auditory, tactile and visual modalities [151]. Further, all students learn better from lectures presented in shorter 5–20 minute segments rather than longer 60–120 minute sessions [153]. This is in keeping with recent educational trends towards the flipped classroom model, in which lectures are broken into smaller chunks and interspersed with other activities [154].

Research also indicates that dyslexic students mostly manage their own difficulties on an individual level with minimal access to or assistance from each other. Participants reported developing a unique set of compensatory strategies in isolation from others and without any sharing or supporting each other, support groups or dyslexia associations and agencies (e.g. [115, 116, 127]). In the context of the broader disability and social inclusion literature [155, 156] moving towards a more collectivist community approach is optimal, as students would benefit from collaborating and sharing their ideas, strategies, experiences and insights. For example, MacCullagh et al.'s [116] participants noted that university students with dyslexia not only face considerable learning and assessment challenges but also exhibit strengths. They reported helpful and effective strategies at individual and institutional levels, study techniques, adjustments to course materials, variety of teaching and assessment formats, and specific staff and student training. These were considered as effective measures towards university success for students with dyslexia.

MacCullagh et al. [116] linked appropriate and effective learning experiences to university legislation on equity and opportunity, and notes that research findings, "add to moral and legal justifications for provision of accommodations for university students with dyslexia" (p. 16). Likewise, when focusing on post-secondary assessment, Chetcuti et al. [38] implore for more fair play and feedback from young people with dyslexia themselves as the main stakeholders.

10. Knowledge, attitudes and stigma

Studies addressing issues of shame and humiliation cannot just address the university experience, but need to also understand the whole school experience. Many share stories of humiliation, mostly due to being made to read aloud in class or taking longer and/or being punished for taking longer to complete work (e.g. [90, 157, 158]). Participants in such studies narrate that the humiliation was not only due to public exposure of their reading and writing difficulties, but also ridicule from teachers. Such negative experiences affect so deeply, they linger throughout one's lifetime as a traumatic and permanent experience (e.g. [38, 85, 157]) or what Khan [159] termed as cumulative trauma.

Persons with covert challenges tend to report more negative experiences that those with overt challenges [160]. Barga [161] explored the experiences of nine university students with dyslexia and evidenced experiences of labelling and stigma as barriers to learning. Six participants deliberately did not disclose for fear of rejection, ridicule and stigmatisation. Likewise, Rao [162] reported non-disclosure to avoid negative social repercussion, even though participants were aware that this may have hinder their academic progress and success. Further, the literature continues to evidence stigma towards such a population as being intellectually inferior (e.g., [5, 30, 157]). Dyslexic university students' preference to manage their own difficulties with minimal access to assistance (e.g. [112, 151, 153]) supports research findings indicating shame, embarrassment (e.g. [84, 163, 164]) and complex

decision-making processes regarding disclosure [164]. One needs to dream of better inclusive societal approaches and attitudes (e.g., [34, 155, 156]).

Mortimer and Crozier [112, 165] reported that students in their studies expressed frustration at "the lack of communication between the [support] unit and the academic departments. Academic tutors frequently had little knowledge about dyslexia" [112, p, 248]. One of their participants shared how she was publicly Chastised: "In my exam, the lecturer didn't realise I had extra time. In the hall, in public, he said, 'Put your bloody pen down'. I had to say 'I'm sorry I'm dyslexic'. It made me feel like a total leper. There is a lack of communication between departments, some know, some don't (p. 248)." Mortimer and Crozier [112] reported that:

> *Although students were unanimous in their appreciation of the staff in support units, they did express criticisms of the lack of staff available, overworked members of staff, a dearth of equipment, limited opening hours and difficulty of access—several students reported that initially they did not know where to go or could not find the unit. Others expressed concern about the stigma of entering a unit labelled 'Disability'. (p. 248)*

10.1 Educators' perceptions

Regarding labelling and teachers' perceptions, strategies and actions, research presents various scenarios. These include difficulties to teach, less intelligence, and feeling sorry for the students (e.g., [166–168]). Frymier and Wanzer [169] also noted that such perceptions often stem from the issue of hidden challenges and negotiations regarding fair accommodations, also in respect to other students. This strengthens my thesis that such accommodation should be a choice-for-all rather than an accommodation. Lock and Layton [6] concluded that lecturers in their study believed that such a label was to get out of doing work, out of laziness, or not trying hard enough. This belief was reaffirmed even when these lecturers were presented with studies that such a population tends to work itself to illness and exhaustion to achieve levels expected from their peers (e.g., [5, 38, 170]).

The literature indicates several reasons for such stigma. These include lack of knowledge [171], invisibility of profile [172], accommodation perceived as cheating by teachers and peers [173], self-fulfilling prophecies leading to underperformance and even criminality [174, 175], confirmation of bias with beliefs, ignoring individual characteristics (e.g., [176–178]) and generation of negative expectations [179].

Labelling, however, also has positive effects as willing teachers may be able to interpret behaviours better to then provide appropriate teaching strategies (e.g., [34, 180, 181]). Further, the label also helps one's understanding of one's own behaviour (e.g., [158, 166, 182]).

11. Demographics and effects on lecturers

One cannot underestimate that dyslexia presents challenges to university lecturers (e.g., [122, 183, 184]). This population has not been visible, although it has always existed (e.g., [112, 165, 185]). Since the challenges are invisible, teaching adaptations for such a population have perhaps been neglected. Widened access to university studies for students with functional disorders, such as dyslexia, have led to this neglect being made visible [143].

Teachers are undoubtedly important people in the lives of dyslexic schoolchildren and teachers who help or hinder play a part in dyslexic people's lives. Teachers remembered most negatively were those who humiliated dyslexic pupils in front

of their peers. Many report negative teachers' attitudes towards dyslexic-type difficulties, and lack of knowledge about dyslexia and intervention for dyslexic difficulties. However, pupils who had attended specialist schools were more likely to report positive experiences [88].

Riddick et al. [91] reported that three dyslexic student-participants in higher education experienced positive school experiences and stated that their lecturers had acknowledged their profile, were sensitive to their needs and had provided helpful intervention. A participant from Hellendoorn and Ruijssenaars' [90] study reported that "I will never forget Mr X. When he came in my life, something changed, because he really understood. He at least gave me credit for the hard work I did, even though I still could not read" (p. 233). In contrast, others speak of teachers who treated them as if they were unintelligent and/or lazy, refused to accept that students were dyslexic and/or provide any accommodation and/or taught them inappropriately (e.g., [90, 91, 167]).

Students with dyslexia judged support received from specialists, teachers from special schools, licenced remedial teachers, speech therapists and psychomotor therapists favourably (e.g. [90, 91, 186]). Burden [88] reported that out of 50 dyslexic boys, 62% explained that mainstream teachers had not understood their feelings, whereas at their specialist school only 4% felt the teachers did not understand their profiles. These findings suggest a need for additional training [9].

12. Post Covid-19 and technology - compensatory strategies to academic success

Technology has improved so much [187], that schools [188, 189]must consider its use to access and create print (e.g., [189–191]). Technology is regarded as the "fourth revolution in the means of production of knowledge following language, writing and print" ([190], p. 39). Warschauer and Matuchniak [192] reported a broad consensus among educators, communciation scholars, sociologists and economists that, "information and communication technolgoies (ICT)...bridge the interactive features of speech and archival characterists of writing" (p. 179). Gutenberg's printing press (c. 1440) started the third revolution - printing. However, it took centuries for printing to truly infiltrate and affect society with the advent of industrial Revolution (c. 1760). The transition between the third (Print) and fourth (Technology) revolution was faster. We have transitioned from an industrial to an informative economy in mere decades [193, 194].

Given the present global health situation, such research is now even more important. Current social distancing has necessitated more independent learning and further use of technology [195]. This may prove more beneficial if the necessary skills are addressed. An Economist's [196] weekly editorial dedicated to the absent university student reported that:

> COVID-19 is catalysing innovation ...offering ...students the opportunity to take online courses...huge scope for using digital technology to improve education. University are rightly proud of their centuries-old traditions, but their ancient pedigrees have too often been used as an excuse for resisting change. If COVID-19 shakes them out of their complacency, some good may yet come from this disaster. (p. 7)

One also needs to be cautious and not conclude that millennials and younger generations are automatically technology experts or comfortable with all computer usage. For example, Prensky [197] reported that, with regard to reading materials, approximately half of the students in their study (average age 23.7 years), both

dyslexic (7 of 13) and non-dyslexic (11 of 20), expressed difficulty reading text online and using learning technologies. This contradicts assertions that the 'net generation' is all 'digital natives' and can be expected to use educational technology with ease and proficiency. Rather, the data from this study support Kennedy, et al.'s [198] conclusion that students in the 'net generation' are not necessarily technology experts and may require explicit technology training. This may also be due to their school experiences regarding Access to literacy and learning.

13. Final thought

UNESCO [199] reports that "at least 750 million youth and adults still cannot read and write and 250 million children are failing to acquire basic literacy skills" [para. 3], thus excluding excludes them from "full participation in their communities and societies" [para.3]. Clinton's [200] International Literacy Day message implored that:

> *If our world is to meet the challenges of the twenty-first century, we must harness the energy and creativity of all our citizens. Nearly half of American adults lack many of the basic literacy skills so essential to success in today's complex and ever-changing world. Literacy is not a luxury; it is a right and a responsibility. And in an international community increasingly dedicated to the principles of equality and opportunity, illiteracy is unacceptable. (p. 1713)*

In this chapter, I endeavoured to reflect on what should be considered as literacy in the 21st century and how our communities need to ensure that all who want to pursue further academic education may do so easily and with dignity. The aim was to help highlight what literacy means in the 21st century and what competencies relate to intelligence and academic success, or otherwise. In human's fourth revolution of knowledge, transmission and sharing [190], whilst we need to appropriately train educators to ensure that all become proficient in all literacies as early as possible (e.g. [9, 20, 21]), we must also consider that traditional skills of reading and writing cannot continue to remain obstacles [201] for whom such skills are not so easy to learn and become proficient in. As Leonardi da Vinci noted: "I would rather have a scientific mind without literary skills, than a literary person without a scientific mind"[2].

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Conflict of interest

The author declares no conflict of interest.

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[2] Sentence often attributed to Leonardo da Vinci (e.g. azquotes, quotefancy, quotemaster). I continue to search for the original source in his writings.

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