Issues for Debate

When saying 'go read it again' won't work: Multisensory ideas for more inclusive teaching & learning

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A B S T R A C T

For a progressively diverse student cohort whose members learn in a multiplicity of ways based on individuals' educational experiences, cognitive profiles and academic capabilities, medical (human and veterinary) studies may prove increasingly challenging. Traditional 'one size fits all' methods of instruction may no longer be appropriate nor allow students to reach their personal academic potential. More individually tailored approaches might prove more successful.

Using ten case study 'vignettes', the author draws on experience of offering specialist study skills support to human and veterinary medical Higher Education students with Specific Learning Difficulties (SpLDs), such as dyslexia, dyspraxia and ADHD, to illustrate how even very simple multisensory approaches, introduced within a one-to-one tutorial environment, can overcome learning barriers. The author suggests that knowledge about, training in and practice of multisensory techniques should be incorporated into mainstream teaching for all HE learners, specifically through the medium of individual tutorials and/or small group-working.

1. Introduction

Human and veterinary medical studies often present significant challenges to learners in Higher Education (HE) with the Specific Learning Difficulties (SpLDs) of dyslexia, dyspraxia and Attention Deficit Hyperactivity Disorder (ADHD/ADD). Acquiring an extensive new vocabulary and ways of thinking about problems, absorbing information visually and auditorily, then rapidly making sense of considerable amounts of this new material expressed in that new vocabulary is always likely to be difficult. Additionally, gaining a wide range of new practical skills (including sequencing and spatial) all executed in a prescribed way and to a high degree of accuracy often under pressure can call disproportionately upon the typical areas of relative weakness associated with these SpLDs. With further widening participation in HE (UK Government, 2015) resulting in a student cohort with yet broader educational experiences, cognitive profiles and academic capabilities these studies' challenges extend beyond learners with SpLDs.

The UK response to SpLDs has been to 'retrofit' additional specialist study skills support, usually funded, for home students at least, through Disabled Students' Allowances (DSA) and making 'reasonable adjustments' through assessment accommodations on an individual basis. However, some HE Institutions (HEIs) have expended considerable

effort in providing more widely supportive environments, for example when their SpLD students are on placement (University of Southampton, n.d.).

However, some of the challenge might partially be due to the limitations of single or dual sensory teaching which traditionally places significant reliance on visual and auditory working memory, memorising and rapidly recalling facts using semantic memory, reliance on mono-dimensional sequencing and spatial skills. Hence, for any learner for whom the traditional approaches appear not to work, even after many repetitions, suggesting that, for example, they 'read it (yet) again' – using these same potentially weak abilities - is unlikely to be an effective teaching strategy.

This paper argues for a pre-emptive approach which, by incorporating multisensory teaching, engages the maximum number of senses – seeing, saying, hearing, doing – to strengthen memory and recall (Diverse Learners, 2015), and harnesses learners' full range of cognitive abilities with concomitant improvements in their academic performance. As eloquently stated nearly two decades ago, "in response to the widening access to further and higher education, all teachers need to re-evaluate their approach to teaching to accommodate … students with a wider range of individual needs. Traditional models are not enough. The emphasis is more and more on the individual learner"

(Morgan and Klein, 2000, pp. 137–138). By so doing, HE institutions (HEIs) will more effectively fulfil their anticipatory Public Sector Equality Duty under the Equality Act (2010) for their whole student cohort.

This paper offers a series of case studies drawn from under and postgraduate HE students following human and veterinary medicine courses, each with one or more SpLD and is based on the author's experience of providing specialist study skills support under Disabled Students' Allowances (DSA). In reading these case studies readers may recognise that the learning issues encountered by these learners with SPLDs in their medical courses are common across the cohort. The aim of this paper is to inspire readers to review their teaching, to learn and incorporate multisensory methods within it and so help all their diverse students achieve their academic potential.

2. Inclusive teaching and learning

Although there is no universally agreed definition of inclusive learning (Thomas & May 2010), the following provides useful guidance: "Inclusive learning and teaching in higher education refers to the ways in which pedagogy, curricula and assessment are designed and delivered to engage students in learning that is meaningful, relevant and accessible to all. It embraces a view of the individual and individual difference as the source of diversity that can enrich the lives and learning of others" (Hockings, 2010). Key features of this definition, in the context of this paper, are the emphasis on engaging students whatever their difference from their peers. Indeed, implicitly the definition suggests that all learners are unique and potentially would benefit from individual guidance or support. Barriers to implementing inclusive learning environments are many (Newman and Conway, 2016) and unfortunately, even 8 years after Hockings' definition there is still uneven progress towards inclusive teaching and learning, as recently identified by HEFCE-commissioned research, "Most institutions reported high variability in their implementation of inclusive teaching and learning approaches. This results in patchy and inconsistent practice and pockets of good but also poor practice. Institutions therefore highlight the importance of bringing about cultural change and getting staff buy-in as they move to greater inclusion" (Williams et al., 2017). This lack of universality provides the impetus for this paper.

3. Multisensory approaches

As previously discussed, a multisensory teaching approach can be defined as one which engages the maximum number of senses – seeing, saying, hearing, doing – to strengthen memory and recall, so harnessing learners' full range of cognitive abilities (Diverse Learners, 2015).

Morgan and Klein (2000, p. 169), amongst others, have long advocated the use of multisensory approaches for dyslexic learners "multisensory approaches are known to work best with dyslexic learners" and Mortimore (2003, p. 270) states, "experience dictates that the most successful approach for dyslexic students is the multisensory route". Morgan & Klein also advocate using the techniques more widely, "multisensory approaches are known to work best with dyslexia learners … although all learners may benefit from multisensory strategies" (Morgan & Klein, 2000, p. 169). The Study Skills Handbook, which has sold over ¾ million copies (Palgrave Macmillan, n.d.), states simply, "The more we use our senses … the more opportunities we give the brain to take in information using our preferred sense" and "the use of several senses also gives the brain more connections and associations, making it easier to find information later, which assists memory and learning" (Cottrell, 2013, p. 4).

Morgan and Klein also provide a useful example of multisensory approaches, "many students find that their learning is enhanced when tactile and kinaesthetic strategies are employed … acting out situations or case studies through role-play helps them commit information to their long-term memories. The greater the variety of ways in which

information is presented, the more likely it will be that effective learning will take place (Morgan and Klein, 2000, p. 137).

Traditional ways of teaching may even be holding students back, "multisensory approaches may also work for mainstream learners and … an overconcentration on talking and listening may be hampering their learning" (Mortimore, 2003, p. 270). Mortimore also cautions that "it is always tempting for the teacher to stick to his or her own preferred [learning style] but it is clear this is risky. Bringing a multisensory element into any teaching situation can avoid difficulties" (Mortimore, 2003, p. 189).

The cases presented below provide numerous examples of multisensory approaches which enabled the learners to move forward towards their academic potential when apparently blocked by a combination of the way they learnt and the way in which their courses were taught. The techniques were used within the context of providing specialist study skills support tutorials as part of the DSAs' provisions. The weekly, hour-long tutorials were held on a one-to-one basis in a safe, secure and private environment (including, for example during placements and vacations, remotely via Skype/FaceTime), the learners identifying their longer term as well as more immediate needs, the tutor and learner subsequently exploring the nature of the learning barriers and potential solutions to them. Typically, within a single academic year, the learner would attend between 20 and 30 tutorials.

4. The case vignettes

Case vignettes are presented in a standard format starting with a title which encapsulates a key feature. When describing interactions between author and learner the first person is used in the narrative. Each learner's learning issue(s) is presented and briefly described followed by a short discussion of the strategy devised during the specialist study skills tutorials to overcome or reduce the problem; the result of the strategy is noted. Each discussion includes an identification of the learner's strength(s), upon which the successful strategy was based. The vignettes do not assign a label, such as dyslexia, dyspraxia, ADHD/ADD, to the learner as their learning issues are seen as generic. All learners were following a first or second degree in human or veterinary medicine or allied subject, studying to be doctors, nurses or other roles in the profession; their identities have been anonymised to ensure confidentiality.

5. The strange case of the 'woffling' student

Learner 1 scored high marks in all work except the mandatory fortnightly case presentations to the group. By the student's own description, presentations 'woffled', drifted off the point and invariably ran out of time. The student's talent of being a great raconteur and love of detail combined to exacerbate the problem. However, the student also enjoyed crime novels and this past-time was the germ for the solution. Instead of the case presentations merely reciting a series of facts, we worked on the idea of characterising the case through a title which might have come from a crime novel and then 'unfolding' the story.

Hence, "The strange case of the American tourist in London" told the story of, just that, an American, who feeling ill on a trip to Europe walked into the learner's A&E department. The student achieved immediate success in the presentation, did not run out of time and the performance was highly praised. The next presentation, "The patient with the melon and the golf ball" similarly 'wowed' the audience and facilitated telling the intriguing story of the effect of grossly unequally sized kidneys. Perhaps the learner's most challenging case was entitled, "When the doctors doubted their own sanity" which told of the patient who ultimately was shown to be delusional but whose fantasies almost convinced the doctors that they were wrong. Learner 1 maintained this approach throughout the rest of the course, graduating successfully.

6. Walking to your own rhythm

Learners 2, 3 and 4 shared a frustration, a major difficulty in rote learning as well as remembering sequences, for example, the anatomical names for the musculoskeletal components, endocrine sequences. For Learners 2 and 3 our first tutorials had revealed strengths in music, although of a quite different nature. Learner 2 was a classical violinist and singer whilst Learner 3 drummed with a heavy metal band. Both could remember long musical sequences unsupported by sheet music. Clearly elements of their memory were not the issue, just those parts of memory they were trying to use to remember and recall sequences or apparently unconnected information. Learner 2 was faced with learning the names of all 200-plus bones in the adult human. Hence, appropriately, we downloaded the Jazz/Gospel song "Dry Bones" (Delta Rhythm Boys, 1934/2013) and enjoyed a good 'swing-along' before becoming serious and starting to set the anatomical names to the music. The student returned the next week, exceptionally pleased, fluently singing all the names in the right order from toe to head and back again without a piece of paper in sight.

Learner 3, similarly, applied a drumming riff to remember various series of endocrine reactions. Both students continued to use their musical abilities as a framework on which to hang their knowledge.

Learner 4 had the same issues in remembering sequences but was not a musician, however, as an international student raised in a completely urban environment, delighted in walking in the local "very green" British countryside. In a variant of the Cicero's Memory Palace technique of remembering information by hanging individual elements on a walk around one's palace (or college room), Learner 3 used the features of extensive walks as the framework for the knowledge (Thomas, 2014), ultimately passing both 4th and 5th year exams, entering practice and potentially being the fittest person of the cohort!

7. Committing to good intentions

Learner 5 was very easily distractible, particularly by email and social media, during revision. Apps to limit or block access to the internet had proved ineffective, the student just found ways of circumventing them. In our tutorial discussions this student talked about personal commitment and gave numerous examples of 'going the extra mile' in order to not let people down. The learner also possessed a strong sense of future aspirations, wanting to work with NGOs in Africa, combining strong multi-lingual skills with medical knowledge and a desire to make a difference. Together we built on the idea that the future would only become reality if the final year's revision plan was adhered to and led to successful results. The student identified a need to be accountable to somebody, feeling a lack of personal accountability, and asked if I would be that person. We discussed the limitations of my role as study skills tutor, eventually agreeing on a daily short text message every evening over the final month of revision. I was to respond with brief words of observation and/or encouragement. The text messages identified work done that day and anticipated work for the next, progress would be reviewed during our weekly tutorials. We maintained the texting, the student achieved the revision plan, final exams were passed.

8. The mental gymnast

Learner 6 expressed some desperation, the medical teaching was largely by system, such as cardio-vascular, gastro-intestinal, but the examination was by disease or system malfunction, "I'm not a mental gymnast, I can't look at things both ways at the same time." This learner, in contrast to Learners 2 and 3, already possessed effective sequencing skills for academic knowledge and was thoroughly at home with flowcharts. Together we worked on the idea of a Disease Flow Chart, based on a standard template, whereby each condition was named, its pathogenesis identified, clinical signs described, differential diagnoses stated followed by tests, treatment and prognosis. The student adopted the idea immediately, sharing it with many colleagues. However, Learner 6 felt that the idea could also be used to capture the course's directed learning/case study sessions which would form a significant part of the exams. With just a few simple changes the adaptions were made. Learner 6 succeeded in becoming the "mental gymnast" which seemed initially so impossible, graduating successfully. Additionally, the disease and directed learning flowcharts are now 'standard' techniques the author discusses with all human/veterinary students.

9. The power of the clipboard

Learner 7 experienced limited auditory working memory which had been effectively compensated in lecture-based instruction through extensive use of recordings. Significant problems arose, however, when involved in hospital 'rounds' where typically participants were required to give their opinions on material just presented by the clinician. Learner 7 could usually remember only 2–3 points and under the pressure of the moment might even lose those. In other work, Learner 7 frequently used tables and small 'doodles' to aid memorisation. We took these two ideas and created Case Templates, appropriate to individual clinical areas, which contained prompts for the key case information. The template not only contained prompting words but simple 'stick figure' representations. Armed with clipboard, pen and template, as well as the clinician's permission, Learner 7 was able to compensate for limited auditory working memory. Indeed, the daily reflections, which were a necessary part of the course were made significantly easier with the completed templates acting as reference material. Learner 7's progress was noted by colleagues, a number of whom adopted the same approach. A development of the idea involved 'size reducing' the A4 sheet to one which could be glued into a 'policeman's notebook', which was both more discreet and more convenient, the notebook fitting conveniently into the learner's scrubs. A little while after graduating and entering practice Student 7 emailed the author with a great sense of achievement to say that the templates had become so familiar that they were no longer required.

10. Vote me!

Learner 8 was frustrated by a longstanding inability to put views forward in group work due to very low self-confidence, feeling that the views might be inherently wrong and/or that colleagues would not take them seriously, shouting them down. Contrastingly, Learner 8 was vocal in student welfare, borne of many difficult personal experiences, wanting to make a difference for others. In a forthcoming student union election Student 8 wanted to stand for office. I thought we could use Learner 8's obvious political aspirations and abilities to help build self-confidence. This increased self-confidence might translate into the learner's group-work. We worked to create an election manifesto, the idea of creating a band of supporters and having an election slogan printed on their T-shirts. We discussed the issue of the risk of a potentially unsuccessful election further reducing self-confidence, which Student 8 dismissed with, "I know I'm right". After a successful election, we reflected in our tutorials that having a well-argued case for one's own views in group-work was rather like having a political manifesto and that pre-preparation, within a standard template/formula, for the group-work sessions might help build Learner 8's confidence. This pre-preparation was realised over the next term and combined with Learner 8's union work feeding a growing personal sense of confidence significant success was enjoyed in the group-work. The learner became highly respected in both academic and welfare roles.

11. The video about the kidney – the vidney

Learner 9, in common with a number colleagues, had trouble with

memorising kidney function, finding it complex and immemorable. We tried to address the issue by taking a kinaesthetic approach, literally standing up to act out some of the stages, rather like the party-game of Charades. From being extremely 'down' about the subject the learner 'came to life' during our enactments, which were accompanied by much laughter. We ended the tutorial with Learner 9 agreeing to continue the kinaesthetic approach and report back the next week. Learner 9's agreement far exceeded what either of us had anticipated, a 3 minute video about kidneys, entitled the Vidney, in which the student and colleagues created a game of charades based around kidney function using mime, questioning and 'the reveal'. They clearly had had fun in producing it, my learner's self-confidence was boosted during a long revision and, whilst not wholly responsible for exam success, made a contribution to it as kidney function was one of the questions.

12. Not the Mona Lisa

Learner 10 was focussed on diagnostic imaging and exhibited very strong visual abilities. However, in an apparent paradox, this student experienced significant difficulty translating/decoding written descriptions of anatomical features shown in the 2-dimensional images into personal mental representations; the descriptions "don't make sense to me, I'd describe them in a different way". We identified that Learner 10 was a competent creator of line drawings (one up on stick figures) and could quickly redraw plates and diagrams shown in the textbooks to create images of them, so providing accessible personal representations. This drawing ability, however limited in an artistic sense, was Learner 10's "dyslexia advantage" (St John-Matthews et al., 2016, p. 26). Hence, "let's draw this, even though it won't be the Mona Lisa", became the mantra for our tutorials covering all the course elements, physics as well as diagnostic analysis. The theoretical exam was successfully passed.

A later part of the curriculum required the cohort to be examined via a live test in which an image is presented for a short time after which examinees give a verbal analysis to observers. This exam protocol presented two challenges for Student 10, the need to follow a standard analytical sequence and the rapid recall of information, neither of which were strengths.

Fortunately, Learner 10 was part of a highly supportive cohort which took self-responsibility seriously, having 'clubs' based around, for example, academic journal review and interesting case studies. Hence, Learner 10 created a quiz club to which the members would contribute images together with the observations which could be made about them; together members could role-play the actual examination. Although well-received in terms of its objective and function, the quiz club suffered from being an extra activity at the end of a long day for the cohort members. Rather than have the club fold, Learner 10's approach was to take along refreshments, literally to sweeten participation. This quiz club is on-going, the exam is scheduled for early 2019.

13. Conclusion

Ideally, this paper has provided a level of inspiration based on reading about learners' abilities to overcome their obstacles to learning, Hopefully, too, the paper has demonstrated some ways in which multisensory, hence more inclusive, techniques have worked successfully with students who possessed a range of different needs. These needs were and are generic across cohorts and exist on a spectrum of mild to severe. Addressing this spectrum is part of becoming more inclusive teachers. However, how can these ideas be carried forward by readers?

The author envisages two ways where these techniques are married to and incorporated within the subject matter and epistemology:

1. Academics could extend their current individual tutorial approach to include multisensory techniques on a one-to-one basis, tailored to individual learner's needs. This method could be described as

mainstreaming the specialist study skills tutorials currently offered via DSA.
2. Offering the multisensory techniques in small groups, addressing frequently encountered problems or problems nominated by the groups (Wray et al., 2013); (Newman et al., 2018 (in press))

A privilege of working as a specialist study skills tutor is that one gains a deep understanding of the nature of each learner's strengths and weaknesses so enabling the former to be used to support the latter. This knowledge is gained over numerous tutorials focussed on the study skills, not on the subject matter as such, although a knowledge of the subject matter and its epistemology are very useful in identifying solutions. Given the increasingly diverse student cohort and the need for HEIs to become more inclusive in teaching and learning it may be that offering study skills tutorials to all learners, in either or both of the above ways, would provide a vital link between teaching and learning. This new support could give all learners a better pedagogical experience through tailoring study skills solutions to their individual needs, so allowing them to take more effective control over their own learning and achieve their academic potential. The suggestion "just read it again" should be heard no more.

14. Definitions

For a general overview of dyslexia, dyspraxia and ADHD, David Grant's book *That's the Way I Think* is a short and very accessible (nonspecialist) book which explains the SpLDs below with clarity and simplicity (Grant, 2010).

14.1. Dyslexia (Rose, 2009); (BDA, n.d.)

Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling.
Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed.
Dyslexia occurs across the range of intellectual abilities.
It is best thought of as a continuum, not a distinct category, and there are no clear cut-off points.
Co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration and personal organisation, but these are not, by themselves, markers of dyslexia.

14.2. Dyspraxia (Dyspraxia Foundation, n.d.)

Dyspraxia, a form of developmental coordination disorder (DCD), is a common disorder affecting fine and/or gross motor coordination in children and adults. It may also affect speech. DCD is a lifelong condition, formally recognised by international organisations including the World Health Organisation. DCD is distinct from other motor disorders such as cerebral palsy and stroke, and occurs across the range of intellectual abilities. Individuals may vary in how their difficulties present: these may change over time depending on environmental demands and life experiences.
An individual's coordination difficulties may affect participation and functioning of everyday life skills in education, work and employment.
Children may present with difficulties with self-care, writing, typing, riding a bike and play as well as other educational and recreational activities. In adulthood many of these difficulties will continue, as well as learning new skills at home, in education and work, such as driving a car and DIY.
There may be a range of co-occurring difficulties which can also have serious negative impacts on daily life. These include social and emotional difficulties as well as problems with time management, planning and personal organisation, and these may also affect an adult's education or employment experiences.

Many people with DCD also experience difficulties with memory, perception and processing. While DCD is often regarded as an umbrella term to cover motor coordination difficulties, dyspraxia refers to those people who have additional problems planning, organising and carrying out movements in the right order in everyday situations. Dyspraxia can also affect articulation and speech, perception and thought.

14.3. ADHD (Royal College of Psychiatrists, 2015); (AADD-UK, 2017)

ADHD is a pattern of problems which is usually picked up in childhood. Parents and teachers notice that a child is unusually over-active gets distracted all the time, cannot stick to doing something for any length of time is impulsive, and does things on the spur of the moment without thinking and has great difficulty in concentrating.

Many of us have at least some of these problems, but do not have the diagnosis. To have the diagnosis of ADHD, these problems must be bad enough to interfere with how you get on with other people or with how you perform at work or school.

It tends to get better with age but can continue into adulthood. The over-activity usually gets less, but impulsivity, poor concentration and risk-taking can get worse. These can interfere with your work, learning and how you get on with other people. Depression, anxiety feelings of low self-esteem and drug misuse are more common in adults with ADHD.

Conflicts of interest

1 I am the director and sole employee of a company, Dyslexia Handled Ltd, which supplies SpLD diagnostic assessments and provides Non-Medical Helper support (specialist study skills) to SpLD students in HE.
2 I deliver Non-Medical Helper support (specialist study skills) to students in HE via various other NMH providers.
3 My spouse is also a director of a company, Viv Newman Associates Ltd, which supplies SpLD diagnostic assessments.

Funding sources

None.

Ethical approval

None required.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://

doi.org/10.1016/j.nepr.2018.10.007.

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