



**A GUIDE TO TEACHING STATISTICS
& RESEARCH METHODS II:
HELPING STUDENTS WITH PERCEPTUAL
& PHYSICAL DISABILITIES**

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I. THE LEARNING CHALLENGES

The Americans' with Disabilities Act (ADA) defines an individual who possesses a physical disability as one who “has a physical or mental impairment that substantially limits one or more major life activities” (ADA, 1990). According to The Learning Disabilities Association of America (LDA), perceptual disabilities “affect the understanding of information that a person sees, or the ability to draw or copy” (LDA, 2011). Individuals who are diagnosed with physical and/or perceptual disabilities (*i.e.*, multiple disabilities) are faced with a variety of challenges both inside and outside of the classroom. These challenges can be broken down into two distinct categories: 1) physical and 2) perceptual. Understanding cognitive deficits in those who possess intellectual disabilities such as visual perceptual issues can be a great asset in modifying pedagogical strategies on how to meet the needs of and to further educate said population (Giuliani & Schenk, 2015).

II. CHALLENGES IN ACADEMIC SETTINGS

Many individuals who have visual perceptual issues experience difficulty plotting data points on a graph, distinguishing items within a chart or a sub-section of a graph, or even simpler things such as signing their names on an attendance sheet. Individuals who are diagnosed with physical and/or perceptual disabilities require special individualized assistance in order to complete everyday tasks required in an academic setting including: writing assignments by hand, taking notes, and completing in-class assignments. Because of this, students with disabilities often have to rely on notes taken by a fellow student or scribe, being partnered with a classmate who may not always want to take notes, not be able to, or are further challenged with physical and/or perceptual disabilities themselves and cannot provide the necessary assistance for them. Thus, contrary to helping students with disabilities, these student aides may at times make the situation worse, by being unable to help the student in need to complete an in-class assignments. This is further complicated by situations whereby, the pace of material being delivered is not matched to the pace at which the student with disabilities can and is able to learn. Taken

together, these challenges can negatively impact a student with physical and/or perceptual disabilities ability to learn as well as increasing the potential for frustration to arise between the student with disabilities and the professor. Although both parties may not always be sure of the best ways in which to assist someone who possesses these types of disabilities, positive and thoughtful collaborations could promote new pedagogical and creative ways to establish new creative methods and approaches to teach students facing such issues during their college education. It is hoped that this book will offer strategies for those types of valuable collaborations in the classroom.

III – CHALLENGES WITH SPECIFIC ACADEMIC CONTENT: STATISTICS

A key characteristic of individuals who are diagnosed with having a physical and/or perceptual disability is motor skill limitations. Motor skills are essential to perform activities of daily living (ADLs), as well as social, emotional, and educational development activities (Houwen, Putten, & Vlaskamp, 2014). As a result, a student who may possess little to no motor skill ability and no real capacity to move does not have an opportunity to be educated through certain pedagogical movement-based actions such as taking notes, which ultimately interferes with the quality of the overall education they receive (Houwen et al., 2014). Thus, college students categorized as having physical and/or perceptual disabilities have difficulty in classes such as Statistics for various reasons related to nature of motor skills required by such a course. The physical nature of writing down equations on paper itself is essentially part of the process of learning the content of the equation, and this applies to math-based courses in general. However, for a person with physical disabilities, this can be extremely laborious and tiresome as many individuals who have a physical disability are either unable to write, and need assistance to do so, or are unable to write for an extended period of time due to shorter latencies for muscle and motor fatigue. A majority of mathematical courses such as Research Methods II, and Statistics are taught entirely through the process of writing out or solving equations by hand, the inability to write for oneself has a tremendous negative impact on the learning experience of the student with disabilities.

While scribes are offered from the Office of Services for Students with Disabilities (OSSD), it can still be challenging for students with physical and/or perceptual disabilities to complete quizzes, tests, and homework assignments. For individuals with a perceptual disability, the process of taking an exam can become extremely and quickly cumbersome. Perceptual disabilities are “often associated to an impaired phonological awareness, the auditory analysis of spoken language that relates the letter-to-speech sound integration” (Gori & Facchetti, 2014). Because of this, the experience of having someone write for you — especially someone who does not understand the subject material or the individual’s disability, far from solving the problem, actually adds to it. Further, there is no guarantee that the same scribe will continue with a student with disabilities within- or between-courses. Not only does the student have to remember everything they were taught, but also faces the challenge of teaching someone else, repeatedly at the expense of losing precious time within and outside of class, a subject they may not be yet familiar with or currently have issues learning themselves. When adapting to these very trying circumstances, some of the focus is pulled from away taking the actual exam and is redirected towards (re)teaching the scribe, about both the course content and helping the individual with a disability. Thereby, further slowing the student’s learning progress for the duration of time it takes to get the scribe up to par.

IV – TEACHING APPROACHES TO ACCOMMODATE STUDENTS WITHIN THE CLASSROOM

When teaching a diverse group of students, it is imperative to remember that every being has capabilities regardless of their ability (Obradović, Bjekić, & Zlatić, 2015). With that in mind, sometimes it may be necessary to be as creative as possible when teaching individuals who may have a physical and/or perceptual disability (Obradović et al., 2015). One method of doing this is by creating an inclusive multisensory environment within a classroom setting (Obradović et al., 2015). A multisensory teaching method “refers to any learning activity that provides simultaneous input or output through two or more sensory channels [or modalities (*e.g.*, visual and tactile)] (Obradović et al., 2015). Doing so allows students to retain the information they are being taught more efficiently (Obradović et al., 2015).

Some ways that a professor can incorporate a multi-sensory teaching approach(es) within their classroom to better educate a student who possesses a physical disability and/or perceptual issues are the following:

- Be actively involved in strategically placed seating. Having an open discussion of seating preference in the classroom can maximize a student with visual perceptual issues to identify a location within the classroom that will optimize their ability to process and visual learn from the chalk board or white board that will be used in the classroom.
- Use different color chalk or dry-erase markers on the whiteboard for improving visual organization of lecture material for students with visual perceptual issues can be enhanced when:
 - drawing diagrams
 - writing equations
 - plotting graphs
 - Since individuals with perceptual disabilities have difficulties with distinguishing visual items, especially if everything is in one color, certain modification may be necessary. Thus, using different color markers/chalk on the whiteboard//black board, can be extremely helpful when writing equations, drawing graphs, and any other type of diagram. Doing this will assist the student's comprehension of the topic, while color coding and organizing information in the way it was presented, regarding what was taught
- Consciously writing in large and clear font on the chalk/white board so that it is two times the size visible for the people in back row. This will maximally ensure that individuals with visual/perceptual disabilities in the front row will have a better chance of visualizing the notes.
- Repeat aloud what is being written on the board, while writing, and repeating once more after it is written.
- Utilize textbooks in e-Book format. The books should be sent to the OSSD to ensure that they can find or obtain digital accommodative packages for students prior to the class beginning.
- Use visually guided programs such as Excel and Statistical Package for the Social Sciences (SPSS). These program can further facilitate user defined color coding, visual graphical representation of numerical data to compensate for different learning styles or preferences of an individual with perceptual disabilities.
- In addition, allowing the student to complete assignments on programs such as Excel or SPSS and giving them the option to submit their responses in multiple colors will increase their

learning comprehension (*i.e.*, match-to-sample color-coded organizational learning) and improve the quality of their work.

- Allow a typed version of homework assignments, rather than written.
- Accept assignments which are color-coded.
- Enlarge handouts to assist the student in seeing the course material, in-class assignments, or course content related handouts much easier.
- Use power-points rather than solely verbal lectures.
- Use a page/reading guide in class.

V – TEACHING APPROACHES TO ACCOMMODATE DIVERSE STUDENT: BLACKBOARD AND OTHER TYPES OF LEARNING PLATFORMS

There have been various policies which work to ensure that students of all abilities are educated properly. For instance, The Inclusive Education Policy (IEP) serves to ensure that people of all diversities are being properly educated (Bjekić, Obradović, Vučetić, & Bojović, 2014). However, one minority that is often forgotten in the larger population served by IEPs are individuals who have special needs. Incorporating technology such as laptops, and online platforms such as Blackboard may increase educational accessibility within a classroom, allowing students of all abilities to participate and interact with fellow students like never before (Bjekić et al., 2014). Accommodating a student on Blackboard is a lot easier than it seems, and doing so will not only benefit the student, but also allows for the opportunity to teach oneself, which positive reinforcement for what was previously within the classroom. Furthermore, having an online platform within an in-person class can allow students more flexibility to upload assignments, and communicate with fellow peers, as well as their professor through discussion boards that may be more time conducive to all parties on Blackboard rather than losing time during lectures. Not only does an online platform benefit students academically, but it can also have a positive impact on them socially and psychologically (Bjekić et al., 2014). The latter point is perhaps, often overlooked and more important for psycho-social educational outcomes equally linked in an individual with disabilities IEP.

Some ways that professors can integrate course material onto Blackboard are as follows:

- Upload class notes & lectures
- Create sections with titles to promote easier to follow organization
- Upload the syllabus and any course grading or scoring rubrics
- Have a clear course schedule
- Include their contact info, office hours, and email readily accessible
- Provide links to on--campus help services (IT-services, Department, etc.)
- Have students upload assignments to submit their work as an option
- Not only would allowing students to record their homework responses digitally help those who have perceptual issues, but it will also make homework less frustrating and less tiring to those with a physical disability.
- Helpful links for Blackboard
- Upload study guides
- Work with the OSSD for ADA compliance features within Blackboard. In addition, the student will have more options to discuss amongst with their study aides as materials are to be offered as per ADA compliance issues within a digital format

In general, using digital learning platform has an enormous advantage for the student with disabilities. Many individuals do not have homework assistance at home or a scribe if one needs help writing, this very real issue places an unforeseen additional limitation upon the student compared to when they do their homework with the assistance of a scribe at school. Doing work at home is easier on an electronic platform. Further, and more generally, homework assignment(s) should be permitted within reason and with justification to be submitted late; thus, proactively managing a real-resource studying issue so it does not causing any negative consequences to their course grades.

VI –INTERACTING WITH STUDENTS WHILE STUDYING: A DIFFERENT KIND OF LEARNING OPPORTUNITY

Working online alone sometime requires students to be independent and self-motivated. In some cases, students need motivation to study more than others. In addition, it may be unclear as to what course material they are confused about and how to overcome this issue with their studies. Spending one-on-one time with a student may be beneficial to the learning process. It has been shown that spending one-on-one time with students has greatly impacted student's learning capabilities (Lemons et al., 2017). To have a personalized, teaching approach, which modifies itself around an individual's specific needs, may help them to better understand certain concepts than they would have with a more general teaching approach (Lemons et al., 2017). While this may seem like going above and beyond a professor's responsibilities, in order to get through to some courses individuals who are diagnosed as having physical and/or perceptual disabilities, such collaboration is imperative. Ultimately, giving a student an opportunity to have one-on-one interactions may be a much overlooked educational opportunity to create a rapport between the professor and student that would have otherwise, never occurred. Such interactions go a long way in motivating and sustaining student efforts to achieve their academic potential and continue to seek and obtain their hoped-for results.

Some ways to assist students with increasing study habits are as follows:

- Provide weekly meeting times
- Have a review class before exams
- Make a review PowerPoint with important information for an upcoming exam
- Pair students together in-class as buddy system regardless of disability
- Develop interactive review games
- Encourage the student to ask questions both in and outside of class.

VI I– CONCLUSION

An important aspect to take away from this student handbook is that just because someone has a diagnosis of a disability does not mean that they are less capable to succeed in academia than any other student who can be categorized as neurotypical. Though at first it may seem like the student with a disability may not be interested in the course, or does not want to achieve academically, that may not always be the case. Professors should be conscious of this very real situation. While in some cases a student may have a dual diagnosis of both a physical, and perceptual disability, there can be instances where a student may only have a perceptual disability without any physical indication of said diagnosis. Alternatively, two people may have the same diagnosis, and this does not mean that their disabilities will necessarily impact them similarly and they should receive individualized educational opportunities. Even though one may be labeled as having a perceptual and/or physical disability, it may look completely different from that of someone else. While this student handbook was written to assist professors and staff in teaching those students who have these types of disabilities, the best thing to do is to ask the student directly. This will help both parties to determine which techniques and methods would work best for attaining their educational goals. To encourage professors to further try and individualize their teaching interventions as a major aspect in teaching in communicating, collaborating, and consistency educating students with disabilities was the impetus for this work. Wanting to overextend yourself as a professional is a great trait to possess, but at the end of the day, it has to be up to the student and professor to both put in the required work to collaboratively achieve academic success, for both parties involved.

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