

# Challenges in Teaching Human Anatomy to Students with Intellectual Disabilities During the Covid-19 Pandemic

To the Editor, *Anatomical Sciences Education*:

In the context of the Covid-19 pandemic and the various subsequent changes and behavioral adjustments necessary in the educational field, two important articles were recently published in *Anatomical Sciences Education* (Franchi, 2020; Srinivasan, 2020). The first study (Franchi, 2020) reported the impact of the pandemic on human anatomy education in the United Kingdom. This article described from the perspective of a medical student how the lack of practical teaching with cadavers can adversely impact training and lead to losses for students. The author further pointed out that the learning environment was less than ideal (Franchi, 2020). Conversely, Srinivasan (2020) reported in the second article that effective and successful online learning was implemented using Zoom video conferencing platform (Zoom Video Communications, Inc., San Jose, CA) in Singapore. Thus, online platforms can act as useful and effective tools for electronic tutorials in anatomy, and this innovation will likely persist even after the pandemic (Srinivasan, 2020).

The rapid spread of Covid-19 has led to a change in social behavioral patterns worldwide. Government decrees determined that social isolation was one way to contain the spread of the disease, based on the premise that isolation would help prevent the collapse of the health system and ensure medical and hospital care for a greater number of people (Walensky and del Rio, 2020).

This reality has compelled society at large to adopt novel habits and behaviors. As a preventive measure against Covid-19, many educational institutions, including those for higher education, were mobilized to adjust their teaching approaches and suspend face-to-face classes. Universities had to adapt to this situation by restructuring their teaching methods by teaching online classes and still ensuring continuity and teaching quality (Franchi, 2020; Srinivasan, 2020; Walensky and del Rio, 2020). These changes were implemented in order to continue education in the virtual classroom as an alternative method (Pather et al., 2020; Srinivasan, 2020) but concurrently, they restricted teaching practices in the anatomy laboratory (Pather et al., 2020). Thus, new resources, mainly technological, had to be part of the altered dynamics

of anatomy classes (Pather et al., 2020). The new educational processes adopted were and still are a great challenge for teachers of human anatomy, especially for those who teach students with special educational needs (SEN) (Guimarães et al., 2020; Huang et al., 2020).

Understanding the current state of inclusion in a higher education institution is essential for the development of opportunities for young adults with SEN (Gilson et al., 2020). Accordingly, we seek to report the pandemic's positive and negative impacts on higher education based on our experience as anatomy teachers in Brazil. In particular, we discuss the possible implications of the absence of face-to-face human anatomy classes on the teaching-learning process, especially for students with intellectual disabilities who are studying physical education.

The challenges and difficulties faced by students with intellectual disabilities in higher education are already well known (Siperstein et al., 2011; Berg et al., 2017; Gilson et al., 2020). Therefore, there is a need to pay continued attention to inclusive education for students with SEN worldwide (Amor et al., 2019), taking into account that physical inclusion alone is not enough to promote inclusion (Nowicki and Sandieson, 2002; Siperstein et al., 2011).

In our state public institution, in mid-western Brazil, anatomy is taught to physical education students through theoretical classes (approximately, 30 students, 3 with diagnosed intellectual disability) and practical classes in the anatomy laboratory (approximately 15 students per class), but without dissection. However, after government decrees imposed social isolation and closed schools, the university adopted the system of remote classes.

At first, for institutional budgetary reasons, students were not given electronic devices, to ensure that everyone had access to remote classes. As a large number of students came from socioeconomically disadvantaged backgrounds, many were unable to access online classes, either due to the lack of a computer or tablet, or the lack of internet with a quality signal. Many students had to attend classes and perform activities using their cell phones, which was a challenge.

Like Srinivasan (2020), we used the Zoom platform to teach anatomy classes. This proved to be an excellent tool, as it was possible to interact with students in a direct and quality manner. We were able to easily share videos and content while viewing the students. However, the free version of this feature allows conferences of only up to 40 minutes, after which we had to leave the virtual environment and make a new video call. This discouraged students and sometimes wasted a lot of time until everyone was able to rejoin. We then chose to use Google Meet, a free communication and video chat platform (Google LLC., Mountain View, CA). As the conference time was not limited on this platform, we favored its use.

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In order to verify the students' performance, weekly assessments were made through WhatsApp video calls (WhatsApp Inc., Mountain View, CA). In the specific case of students with intellectual disabilities, calls were made between the student, special education teacher (support professor), and the full professor of the discipline. This was done so that the student felt more secure and comfortable answering the questions, since the support professor accompanied and assisted in the anatomy studies. This evaluation methodology proved to be efficient as it was possible to establish a secure connection and closer contact between teachers and students, resulting in successful learning.

The use of remote resources, although satisfactory for approaches to theoretical content, cannot overcome a major problem: the interruption of practical content, as laboratories for teaching practices in anatomy remain inoperative. Universities worldwide are facing this issue as students have to learn anatomy without access to learning materials based on practice, such as cadavers, 3D anatomical models, and synthetic parts (Witowski, 2016; Franchi, 2020). Currently, the university provides access to the Athena Hub, a 3D interactive anatomy software, version 1.7 in Portuguese (Medical Harbor, Florianópolis, SC, Brazil) in an attempt to minimize the damage caused by the interruption of practical classes, indicating that these adjustments should continue. In addition, a commitment was made between the faculty and academic management to guarantee practical content for the students as soon as the quarantine period ends.

Among the positive points in the use of remote classes, we noted that there was a closer relationship and dialogue with students, especially those with intellectual disabilities and learning difficulties. Some changes occurred in the structure of classes and evaluations. Kauffman and Hung (2009) indicated that direct, systematic instruction is effective for students with intellectual disabilities; video calls allowed us to impart such instruction and evaluate the teaching content as well as the knowledge learned. As Pather et al. (2020) reported, given the concentrated efforts by all in the face of global changes, the uncertainties and potential vulnerability seem to guarantee an effective learning environment, whenever possible, and even serve as a stimulus for adapted and improved teaching.

In conclusion, the pandemic is creating a new chapter in the history of higher education in Brazil. Although challenging, remote teaching has become a viable alternative as a result of Covid-19, considering the adoption of innovative teaching strategies for students of human anatomy. In addition, the current pandemic-related situation in Brazil has generated new teaching practices to ensure that education is not interrupted and students perform well and retain quality information. These changes will impact the future of anatomy education. Further, this new reality may be a stimulus for public universities in Brazil to adopt new technologies that benefit teaching in the near future; for example, human anatomy learning systems using augmented reality (Kurniawan and Witjaksono, 2018), modern three-dimensional anatomy software (Mitrousius et al., 2018), and e-learning tools, such as A.D.A.M. Interactive Anatomy (Van Nuland and Rogers, 2016; AIA Online, 2020). However, despite the use of new and excellent technological options, it is worth mentioning that face-to-face teaching is still the safest and most effective method to guarantee student success in the teaching-learning process.

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