POSTER - EDUCATION AND OUTREACH

BIOINFORMATICS, ALGORITHMS, AND GAMIFICATION FOR UNDERSTANDING COVID-19 AND IMPROVE VACCINATION ADHERENCE

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The COVID-19 pandemic has highlighted the need to understand the genetic mutations of viruses, the effectiveness of vaccines and the dissemination of scientifically-based information. This showcased the importance of science and technology in combating threats imposed by emerging infectious diseases, and information derived from viral genome sequencing naturally placed bioinformatics at the forefront during the pandemic years. However, in Brazil, there is a significant imbalance in access to bioinformatics education even at the university level, affecting professional training and, consequently, basic comprehension of the matter to society. International initiatives have been successful in promoting bioinformatics education, using active learning methodologies, such as gamification, and collaborations between educational institutions, research and industry. Thus, we apply bioinformatics knowledge, using gamification techniques to make complex scientific concepts about

mutation accessible and engaging in the context of COVID-19 pandemics. The outreach activity was performed as a workshop and it took place at the "Quadra da Portela", located in a working-class neighbourhood in Rio de Janeiro (RJ). The participants included mostly children and teenagers in elementary and high school years, their families and other local community inhabitants. The workshop consisted of two dynamic sessions with incoming attendees. The first was an interaction with the PyMol software to explore the coronavirus Spike protein's structure and function. The second session adapted the classic "Telephone Game," incorporating bioinformatics by simulating the conversion of codons into amino acids like a cell process using a custom-developed algorithm in pycharm software. This approach simulated the translation process and engaged participants in hands-on learning, framing against the coronavirus evolution by mutation and association with vaccine development. The workshop produced positive results, evidenced by rich discussions between participants and mediators about programming, IT, university paths and scientific careers and the importance of the area for the development of knowledge in health sciences, in total more than 15 people with 6 to 40 years old participated in the workshop. Most teenagers had an interest in the activity, but older people liked the game and dynamics. In addition, the gamified approach successfully captured participants' interest, making science accessible and engaging, even for initially apprehensive individuals. Furthermore, the workshop demonstrated the potential of science dissemination actions for the lay public and bioinformatics education to inspire curiosity in new generations in this area. The action was successful in disentangling a relatively complicated topic to the lay public, coronavirus evolution and the COVID-19 pandemic changes, by highlighting bioinformatics as a central aspect of the adopted strategy. Finally, gamification and active methodologies were proven to be valid for disseminating and promoting science literacy in non-formal environments.

Palavras-chave: learning; science education; society.