

From bones to understanding: the importance of teaching biological anthropology to children

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Abstract. Biological anthropology, though predominantly confined to university settings, holds immense potential to enrich pre-university education. Despite its limited presence in primary and secondary school curricula, early exposure to anthropological concepts, can significantly broaden students' knowledge base and stimulate curiosity. Addressing this gap requires training primary school teachers and designing age-appropriate pedagogical strategies but also understanding children's perspectives is crucial for effective curriculum development. Integrating digital tools alongside hands-on experiences in teaching bioarchaeology further enhances learning outcomes. Ultimately, incorporating biological anthropology into pre-university education fosters a deeper understanding of human nature and evolution, preparing students for future academic and societal challenges.

Key words: primary education, biological anthropology, human osteology, teaching, pedagogy

Biological anthropology is an interdisciplinary academic field of study that converges with several scientific areas, such as archaeology, genetics, and other areas of anthropology itself; however, its dissemination and importance is predominantly confined to the university academic sphere. In fact, in Europe, particularly in Italy, the teaching of biological anthropology at the pre-university level of education, such as middle and high schools, is limited if not absent, and is completely non-existent in primary schools.

The role of biological anthropology in pre-university education is therefore limited, but it is important to recognize its significant potential in enriching the educational experience of young students. Biological anthropology requires specific skills such as excavation and analysis of human remains as well as the application of skills derived from social sciences and natural sciences. For these reasons, this complex holistic discipline can play a crucial role in the education of students, offering them a unique opportunity to deepen their understanding of themselves and others (Dynneson, 1998; Ashmore, 2005).

Introducing anthropological concepts at an early stage of education, such as human evolution, osteology and variability, has the potential to greatly expand children's knowledge base and stimulate their innate curiosity about the world around them. This approach not only contributes to a greater appreciation of science subjects, but also to developing crucial cognitive skills that will be of great benefit in later stages of education.

Incorporating biological anthropology into elementary school curriculum can therefore provide students with meaningful content that, when combined with appropriate teaching techniques, helps to prepare pupils more comprehensively for future challenges, providing them with a solid foundation to build further knowledge and skills throughout their education. With this in mind, it is also of fundamental importance to train primary school teachers, who very often welcome the proposal to introduce biological anthropology but express doubts about the timing and lack of resources and knowledge to be able to pass on the concepts to children (Ashmore, 2005).

While this problem has very significant consequences, particularly highlighted and analyzed on the American continent, it may not receive comparable attention in Italian scientific literature. This is due to the fact that the absence of a solid foundation in this discipline leads American students in college to face difficulties in approaching crucial topics such as evolution and human diversity. It has been widely documented that these topics are perceived as 'controversial' by many American college students. This perception can be attributed to a number of factors, including cultural influences, religious beliefs and widespread misinformation. As a result, students who have not had adequate training in biological anthropology may find themselves unprepared to fully understand and appreciate the principles of evolution and the richness of human diversity (Pobiner, 2023).

Lack of preparation in these areas can significantly limit students' ability to participate in academic and scientific discussions critically and constructively at university. This can also negatively affect their academic performance and their ability to successfully pursue careers in fields related to the biological sciences.

Therefore, it is crucial to address this gap in pre-university education by providing students with a comprehensive training in biological anthropology. This will not only better prepare them for university but will also help foster a deeper and more respectful understanding of the complexity of human nature.

By examining successful approaches and initiatives in American literature, we can gain valuable insights and adopt best practices applicable to our own context.

Before embarking on an educational programme on biological anthropology in primary schools, it is fundamental to gain a thorough understanding of the younger children's point of view. This is because how children perceive and assimilate information is crucial to developing an effective and engaging educational curriculum.

Considering children's perspectives allows educators to adapt teaching materials, teaching methods and assessment strategies so that they are appropriate for the age and developmental level of children. Furthermore, understanding children's perspectives can help teachers identify students' interests and curiosities, enabling them to create lessons that are more relevant and engaging for young learners.

Not only that, considering children's point of view can also help educators identify any preconceptions or misunderstandings children may have on the topic of biological anthropology. Addressing such preconceptions early on can help establish a solid foundation for future learning and ensure that students develop an accurate and thorough understanding of key concepts.

In summary, understanding the perspective of the youngest learners is essential to successfully designing and implementing an educational programme on biological anthropology in primary schools. This child-centred approach fosters meaningful and sustained learning, preparing students to critically explore and appreciate the complexity of human nature and its evolutionary origins.

An interesting study was carried out in this regard, by the Boston University researchers. The research investigated the role of essentialism in the way children perceive intra-species variation, focusing on an age group between 5 and 8 years. Essentialism is the tendency to view biological categories as fixed and invariable entities, an attitude that could influence children's perceptions of intra-species variation, including human variation. In Study 1, participants heard descriptions of physical and behavioural traits of imaginary animals, together with their supposed beneficial functions. They were then asked to assess whether all other members of the species would share the same traits or whether variation was possible. The results indicated a marginal tendency towards essentialism, with the children showing a reluctance to accept the possibility of variation. In Study 2, the same method was repeated, but references to the supposed beneficial functions of the traits were removed. The 5–6-year-olds maintained a similar attitude to that in Study 1, but the 7–8-year-olds showed a significant increase in acceptance of variation, exceeding casual expectations. Furthermore, the association between the children's responses and their parents' religious and developmental beliefs was examined. It was found that these beliefs were correlated with the responses of younger children, but not with those of older children, suggesting that with age, children develop greater autonomy from parental beliefs and tend to expect variation.

In summary, these results indicate that although essentialism may influence children's perception of intra-species variation, exposure to facilitative contexts

may foster a greater ability to represent and accept variation. These findings have important theoretical and educational implications in understanding the process of forming scientific conceptions in children and in designing effective teaching strategies to encourage a more accurate and flexible view of the natural world (Emmons & Kelemen, 2015).

Given the children's point of view, it is now necessary to design and adopt the best pedagogical strategies. Pedagogy goes beyond mere teaching: it implies that the teacher not only imparts knowledge, but also critically reflects on and evaluates the effectiveness of the methods adopted to maximize students' involvement and understanding (Spiros et al., 2022).

An important example is the 'Anthropology is Elemental' project promoted by the University of Alabama. This initiative aims to expose primary school students to the anthropological perspective through an interactive curriculum, structured on hands-on activities and articulated in the four main fields of the anthropology discipline, namely biological anthropology, cultural anthropology, linguistics and archaeology. In addition, the project aims to train university students and graduates in the teaching of the subject, while at the same time helping to increase the dissemination of anthropological principles within the community. The project has been very successful, so much so that it has been repeated every year and subsequently included every semester (Funkhouser et al., 2016).

As for our country, Italy, the opening of the University Museum of Medical, Anthropological, and Forensic Sciences for Human Rights (MUSA) in Milan, was a significant event in the academic and social context. Since its establishment, MUSA has been committed to enhancing comprehension and appreciation of medical, anthropological, and forensic sciences in combating violence and preserving human rights. MUSA has played a pivotal role in the proactive promotion of biological anthropology within elementary school curricula. Through carefully planned events and educational initiatives, MUSA strives to impart foundational knowledge of biological anthropology to university and young learners.

Furthermore, the University of Insubria will also be involved in a project dedicated to popularising science in the primary schools of our community. This initiative aims to provide young students with a fundamental introduction to biological anthropology and, in particular, human osteology, with a focus on the practical applications of anthropological analyses of skeletal remains. In addition, a series of interactive practical sessions are planned, designed to actively involve students and stimulate their scientific curiosity. This project is an important initiative aimed at promoting scientific knowledge among young people and arousing interest in anthropological disciplines at an early stage of their educational training. It is hoped that exposure to anthropological concepts and methodologies will stimulate students' curiosity and encourage them to further explore these topics during their academic and professional career. Our department and Anthropology Laboratory have previously engaged in similar initiatives, hosting osteology laboratory activities tailored for young children. These programmes were met with enthusiastic reception from both the children and their teachers.

These programmes extend anthropology to the primary school level and help anthropology majors integrate knowledge through the development of practical learning activities.

In addition, it is crucial to consider the integration of digital tools in the teaching of human osteology and bioarchaeology. The use of digital technologies in the field of biological anthropology has expanded widely in recent years, giving rise to a specialised branch known as virtual anthropology. This discipline focuses on the use of advanced digital tools, such as 3D modelling and virtual reality, for the documentation and analysis of skeletal and bioarchaeological artefacts. In parallel, digital pedagogy represents an innovative educational approach in which electronic technologies are employed as teaching tools. These technologies can be exploited both in the traditional classroom environment, as well as in hybrid applications or fully online educational contexts, in order to improve the way students learn. The use of digital platforms and online resources can offer students flexible access to learning materials, enabling them to deepen their understanding of fundamental concepts in biological anthropology and bioarchaeology. However, although online resources are a valuable tool for learning, there remains a widespread feeling among students that virtual practice alone is not sufficient for comprehensive learning. Particularly in the field of human osteology and bioarchaeology, many students still prefer the hands-on

experience of directly manipulating and studying real human bones. This hands-on practice offers a more tangible and engaging experience, allowing students to develop practical skills and a deeper understanding of theoretical concepts (Raubenheimer et al., 2019; Spiros et al., 2022; Ward et al., 2023).

The integration of digital technologies in the teaching of biological anthropology and bioarchaeology offers new opportunities to enrich the educational experience of students. However, it is essential to balance the use of digital resources with practical experience in order to ensure comprehensive and meaningful learning, especially with regard to primary school pupils.

In conclusion, our discipline offers enlightening content and numerous resources that can have a positive and constructive impact on the students who come into contact with it. Indeed, understanding biological anthropology is an important resource for navigating our diverse and rich world. As anthropologists, we need to start putting our knowledge into practice in real-life contexts, and elementary school students are the ideal starting point for doing so (Ashmore, 2005).

Ultimately, biological anthropology offers a valuable bridge between the natural and social sciences and can play a key role in educating students to understand and appreciate the complexity of human nature. It is evident that the issue of integrating biological anthropology into elementary education has already received attention and yielded promising solutions in the United States, as evidenced by the proposals found in scientific literature. Given this precedent, it becomes imperative for Europe, and specifically our country, Italy, to follow suit. University of Insubria's Anthropology Lab stand at the forefront of this endeavor, actively pursuing innovative research and community-driven initiatives aimed at addressing this lack of biological anthropology and bioarcheology education in elementary schools' curricula. Embracing similar initiatives can not only enrich the educational experiences of our young learners but also foster a deeper understanding and appreciation of biological anthropology's significance in shaping our understanding of human nature. By implementing strategies inspired by successful models, we can ensure that future generations are equipped with the knowledge and skills necessary to navigate the complexities of our diverse world.

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