

EDITORIAL

The value of a liberal (arts) education

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The value of a liberal (arts) education

Traditionally, the liberal arts are those subjects or skills that were thought, in ancient times, to be essential for a free person, i.e. a *citizen*, to know in order to take an active part in civic life, and thus become a virtuous, knowledgeable, and articulate person. What constituted the liberal arts evolved, from a core of grammar, rhetoric and logic (called the *trivium*), to include ⁴ more subjects (the *quadrivium*), namely, arithmetic, geometry, music, and astronomy (Schneider, ²⁰⁰⁴). Interestingly, ³ of ⁴ of these subjects in the *quadrivium* would now be considered to be part of the sciences. In the Renaissance, history, languages (Greek and Latin), moral philosophy (ethics), and poetry featured strongly, whereas in our modern times, a liberal arts education is thought to focus on literature, languages, philosophy, history, mathematics, psychology, and science (Scott, ²⁰⁰⁶).

Several cross-sectional and longitudinal studies at liberal arts colleges have purportedly demonstrated the value of a liberal arts education, benefits ostensibly beyond that of other types of education, in such domains as critical thinking, leadership capacity, and adaptability (Winter, ¹⁹⁸¹). That being said, prospective college students (and their parents), who perceive higher education to be part of “job preparation”, may fail to see the usefulness of the liberal arts. The perception that the liberal arts are irrelevant to this purpose may account for a drop in enrolment in liberal arts colleges (Hersh, ¹⁹⁹⁷). Despite the arguments for (and against) the utility of the liberal arts in higher education, many professional schools have (re)introduced elements of the liberal arts, such as ethics, philosophy and critical thinking, into their curricula (Pearce, ¹⁹⁹⁸; Klare, ¹⁹⁸²; Hafferty & Franks, ¹⁹⁹⁴; Pellegrino, ¹⁹⁹³; Wizner, ²⁰⁰²). Lewis Thomas, in bemoaning the emphasis on the sciences in medical education, said that “the influence of the modern medical school on liberal arts education... has been baleful and malign”. Although would-be medical students cheered the relaxation of rules necessitating the study of Greek and Latin, he noted that “the capacity to read Homer’s language closely enough to sense the terrifying poetry in some of the lines could serve as a shrewd test for the qualities of mind and character needed in a physician” (Thomas, ¹⁹⁷⁸; Brieger, ¹⁹⁹⁹).

This issue of JNUSTA features several articles highlighting the value of a liberal arts education. In our semi-regular feature, “*From the Desk of...*”, Sir Anthony James Leggett, winner of the ²⁰⁰³ Nobel Prize in Physics and Professor of Physics at the University of Illinois at Urbana-Champaign since ¹⁹⁸³, reflects on how an undergraduate education in philosophy has helped his groundbreaking work in physics. Too often the natural sciences and the humanities appear to

speak different languages, even to the extent that each appears irrelevant to the other. But Leggett demonstrates the deep connection between ‘physics’ and ‘philosophy’ and explains how his education in the *Greats* course at Oxford was formative for his subsequent career as a physicist. Not only did an undergraduate training in philosophy teach the future physicist the value of deep, sceptical questioning, but also the “cut and thrust of debate”. This training prompted Leggett to ask questions as to what someone means or how they know, and he is “probably more prone to ask such questions than many of my colleagues”. It further enabled him to see how many of the questions currently posed by physics, and indeed not yet resolved, were asked first by philosophy centuries and indeed millennia ago. He notes that “the most interesting questions are, almost by definition, precisely those which “cannot” be answered by standard known techniques”. Leggett ends by noting that more and more people are recognizing this close and mutually enlightening relation between physics and philosophy, and express the hope that this will continue.

David Wilkinson, Principal of St John’s College, Durham, Professor in the Department of Theology and Religion at Durham University and a Fellow of the Royal Astronomical Society, writes about how a moment of confusion during a conversation with his son about the Big Bang, led to a “moment at the interface of knowledge”, which resulted in reflections about how words can mean diametrically opposite things to a philosopher and a scientist. His unique role as astronomer and theologian gives him insight into both mindsets, and he muses on such concepts as predictive power, which is essential to scientific theory, but has no relevance in theology. Despite the differences between the two, though, Wilkinson reminds us of the commonalities between science, theology and philosophy – a “commitment to resist irrationality”, the “the sense of awe at the complexity and beauty of the universe”, and the central question of “what it means to be human”. He goes on to examine the relationship between science and the humanities, using Barbour’s typology (conflict, independence, integration and dialogue) as a basis for analysis. Finally, Wilkinson highlights the practical aspects of the relationship between the sciences and the humanities, in the form of a philosopher-in-residence at his own Durham University.

It would seem that the relationship between science and the arts is not generally obvious. SC Chan, of Balliol College at Oxford University has frequently been asked by colleagues, how physics and philosophy are linked. In an essay about the interplay between physics and philosophy in undergraduate education, he sees Physics, the most fundamental of the sciences, as being concerned with “understanding the nature of reality”, whereas philosophy, as the most rigorous of the arts, is concerned with “understanding our knowledge of this reality”. Referencing Leggett’s (and Wilkinson’s) articles about the practical links

between science and the humanities, he mentions “professional philosophers of physics”, who have post-doctoral physics research backgrounds and have read philosophy as well. He goes on to underscore the links between philosophy and physics – firstly, “how one body of knowledge informs the other” and secondly, of how an undergraduate education in philosophy and physics “leads an undergraduate to naturally make connections”. He asserts, in conclusion, that “physics and philosophy should be taken to be complementary sides of the same coin. Both might agree on the central problems of the day which have to be resolved, but differ in their approaches”.

The benefits to scientists of studying philosophy are echoed by Andrew Loke. In his opinion piece entitled “The Benefits of Studying Philosophy for Science Education”, he presents the views and arguments of a few prominent scientists on philosophy, arguing that whilst science can answer many questions concerning how natural processes work, there are other kinds of questions that cannot be answered by science, but must be answered by other disciplines such as philosophy and history. He opines that neither science nor philosophy is sufficient in itself, but they need to work with each other and with other fields of inquiry. He also argues that philosophical assumptions play an important role in the scientific method. He goes so far, indeed, as to propose that it would be useful to include a compulsory course on philosophy in the science curriculum.

The last ² articles in this issue highlight some innovations in teaching. In their article “Learning undergraduate human anatomy – reflections on undergraduate preferences in Singapore: a pilot study” Ang et al. provide preliminary results of a survey that compared the degree to which, respectively, first-year medical students and life-science students found acceptable, on the one hand, cadaveric dissections, and on the other, multimedia software that simulate such dissections. After providing an overview of the way multimedia anatomy instruction has become ever more prevalent in the face of such factors as a shortage of, both, anatomy instructors and cadavers, the authors trace the rapid development and exponential improvement in the quality of simulation software. They focus on attempts at the National University of Singapore to teach anatomy using such tools and report on the findings of an initial survey as to students’ perceptions of the relative benefits of these tools when compared with the use of cadavers. Interestingly, these preliminary results suggest that there is room for both approaches, and that there are a number of context-specific variables to consider in making a decision as to the efficacy of each.

Finally, in their short notes on classroom innovations, “Ways of getting your hands dirty”: Activity-Based Tutorials as a Strategy for Enhancing Interactivity in Large General-Education Classes”, Chammika et al. provide an account of a strategy to achieve good, engaged learning within the context of a General

Education Module (GEM) at the National University of Singapore, to a large, heterogeneous, student population. The course, on Oceanography, was implemented as part of a GEM from the Department of Physics. The authors attempted to activate the cognitive processes by adopting a less intellectual, less abstract, but more hands-on approach, that was both engaging and interactive. They introduced an Activity-Based Tutorial (ABT) approach, consisting of hands-on experiments which the students had to perform, in order to either answer some questions, or to understand a concept. The authors provide details of the implementation details of this approach and discuss its positive attributes and challenges. In addition, some feedback from participating students is also shared. The authors conclude that, even though a quantitative study on the effectiveness of the ABTs has not been conducted as yet, each ABT session seemed to be successful, owing to the peer interaction, discussion and excitement that they observed. They will continue to use the same strategy for the next instalment of the same module.

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