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Position statement by the National Executive of the Australian Institute of Physics (AIP) and the Chair of the AIP Accreditation Committee

Temporary replacement of face-to-face classes by online delivery in physics courses impacted by the COVID-19 pandemic

Purpose and context: The Australian Institute of Physics (AIP) is the peak professional and accrediting body for physics in Australia. This statement, developed by its national executive committee and the chair of the accreditation committee, aims to inform and support the discussions between physics departments, universities and schools, policy makers and the public about the long-term effects of the COVID-19 pandemic on physics and science education.

Executive summary: The Australian Institute of Physics (AIP) recognises the challenges posed by the COVID19 pandemic for tertiary and secondary education. The AIP applauds the academics and teachers, and their universities and schools, for their success in maintaining teaching and learning through online delivery during this crisis. However, the AIP's position is that the adoption of a fully online delivery mode should be a short-term emergency response, and should not become a 'new normal'. The AIP contends that the high quality and high standing of physics education in Australia stems from large face-to-face and hands-on curriculum components, from high levels of student-student and student-teacher interactions, and from invigilated examinations. The AIP encourages a public discourse on the nature of physics education post-COVID19. This discourse should consider opportunities for positive change and the long-term adoption of innovative technologies and teaching methods; yet, it should occur with an appreciation of the success that face-to-face and hands-on physics education has had in producing high quality science graduates.

Full statement: The AIP joins other institutions in recognising that the COVID-19 pandemic has created significant challenges in many areas of education. As universities and schools are responding to this crisis, some well-founded practices and standards are temporarily compromised.

In the contexts of university undergraduate and senior-level high-school teaching in physics, the crisis responses include foremost the replacement of the face-to-face learning activities of our current curricula with a range of online activities. The AIP endorses these replacements as short-term crisis management measures and applauds the academics and teachers, and their universities and schools, for their success in maintaining teaching and learning through online delivery. It recognises the creative and swift development of high-quality online learning material, and the long-term value of these resources for physics education.

However, the AIP's position is that the adoption of what is a predominantly online delivery mode should be viewed as a short-term emergency response, to be implemented for the duration of the present crisis. It should not become a 'new normal'.

The AIP contends that the high quality of Australian physics degrees stems from large components of the curriculum being taught hands-on and face-to-face, by way of laboratory-based classes, small-group interactive tutorials, engaging and interactive lectures, individual or collaborative projects, supervised thesis projects, industry placements, and including invigilated examinations. Beyond the individual curriculum components, the social structure of the degree programs with extensive student-student and teacher-student interactions – and the community of learning that these create – are integral to high quality physics programs.

The AIP's position is that this structure and format has provided, and continues to provide, Australia with physics degrees of high quality and international standing.

The above assertion of the value and quality of our degrees should not be confused with an opposition to change. The AIP recognises that, like physics itself, physics education is continually evolving alongside developments in technology and society and that there are instances where the COVID-19 pandemic can act as a trigger for positive change. The AIP encourages the development of novel technologies and methods that enhance learning and teaching or that achieve other merits, such as broader or more equitable access to physics education or a reduction of our institutions' ecological footprint.

Through the accreditation process the AIP fulfils an important function in providing independent quality assurance of physics degrees in the Australian higher education sector. In addition to setting standards for physics graduates, it seeks to represent employer groups of those graduates. The AIP's links with professional associations and governing bodies for physics throughout the world ensure that Australian physics qualifications are of a known standard compared to qualifications in other countries. The nation benefits from maintaining international standards and competitiveness at all times, but never more so than in unprecedented times.

In its quality assurance role and through publicising this statement, the AIP will add its voice to the public discourse about the opportunities and risks arising from the long-term effects of the COVID-19 crisis on the quality and international competitiveness of science education in Australia. This is a particularly pressing topic due to the inevitable, but as yet uncertain effects of the COVID-19 crisis on university budgets in the post-crisis era.

Beyond COVID-19, in all likelihood, Australia and the world will face many and varied challenges, most prominently the manifold impacts and implications of climate change. The availability of high quality scientists including physicists will be essential in understanding, mitigating and overcoming these challenges. With a view to ensuring that the next generation be afforded the best possible educational opportunities, the AIP is committed to contributing towards ensuring the maintenance and ongoing improvements of Australia's educational system, throughout and beyond the turbulence of the COVID-19 pandemic.

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