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TRANS-INCLUSIVE PEDAGOGY IN UNIVERSITY REPRODUCTIVE HEALTH EDUCATION

CHALLENGING CISNORMATIVITY IN HEALTH LAW AND BIOLOGICAL SCIENCE

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This article examines the pressing need for trans-inclusive reproductive health education in science faculties and in law schools (especially in the context of health and medical law). It traces how traditional curricula in health law and human biology reinforce binary and cisnormative understandings of sex and gender, and argues that educators have duties – ethical, pedagogical, and professional – to challenge these norms. Drawing on critical pedagogy, the article shows how inclusive teaching can enrich legal and scientific education. Through practical examples and reflections from health law and human biology courses, it demonstrates that trans-inclusive pedagogy not only better reflects scientific and legal realities, but also prepares graduates to engage respectfully and competently with the diverse communities they will serve in their future careers.

I INTRODUCTION

In universities, reproductive health has historically been taught according to cisnormative understandings of human bodies and reproduction.¹ This cisnormativity revolves around the notion that there is a strict binary division: male or female in terms of 'biological sex' and dimorphism, man or woman in terms of gender, and that a person's gender will align with their sex assigned at birth.² The effect of this is that the teaching of sexual and reproductive health has largely centred on 'traditional'³ ideas that overlook the existence and experiences

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¹ Gabrielle Maria Finn et al, 'It's Not Alphabet Soup – Supporting the Inclusion of Inclusive Queer Curricula in Medical Education' (2021) 5(2) *The British Student Doctor Journal* 27, 28.

² Jojanneke van der Toorn, Ruthie Pliskin and Thekla Morgenroth, 'Not Quite Over the Rainbow: The Unrelenting & Insidious Nature of Heteronormative Ideology' (2020) 34 *Current Opinion in Behavioural Sciences* 160, 160–2.

³ The term 'traditional' is used here to refer to ways of thinking that are established norms in Western cultures, noting that traditions in many Indigenous and other cultures differ from these norms.

of trans, gender diverse, and intersex people.⁴ This is especially true of the way that reproductive health has been taught by science faculties in human biology and medical science courses,⁵ but it is also true of the way it has been taught in law schools (for example, in health and medical law units).⁶

These traditionally dominant narratives about binary sex and gender are being increasingly challenged and displaced.⁷ There is growing recognition and understanding that sex, gender and bodies are not strictly confined to a binary.⁸ The visibility of activism by trans and gender diverse people has played a central role in broadening conceptions of diverse gender experiences, including that a person's gender may not align with the sex they were assigned at birth.⁹ Non-binary, agender, genderqueer, and other gender identities that exist beyond the traditional binary are gaining visibility and acknowledgement.¹⁰ There has also been some shift in understandings of intersex people and their innate variations of sex characteristics,¹¹ with declining acceptance of the medical model which views intersex variations as abnormalities in need of medical intervention, and a greater focus on conceptualising variations of sex characteristics as part of the spectrum of natural diversity of human bodies.¹²

This article argues that there is now a critical need to dismantle cisnormative traditions in our science faculties and law schools, and instead teach reproductive health in a way that is inclusive and respectful of a diversity of sex and gender.

It does so by first setting out the traditional approaches to teaching reproductive health in science and law, noting that cisnormativity is prevalent in both disciplines. It then considers how understandings of sex and gender have changed over time. The article then draws on critical pedagogy (a framework for education grounded in social justice and the disruption of systemic oppression)¹³ to set out why there is a need to teach reproductive health in a way that is inclusive of trans and gender diverse people, arguing that teachers owe duties to their students and themselves to do so. It then moves on to consider some of the hurdles to trans-

⁴ Pamela L Geller, 'Bodyscapes, Biology, and Heteronormativity' (2009) 111(4) *American Anthropologist* 504, 504; Nicholas Fimognari et al, 'Inclusion of Genital, Sexual, and Gender Diversity in Human Reproductive Teaching: Impact on Student Experience and Recommendations for Tertiary Educators' (2024) 48(4) *Advances in Physiology Education* 698.

⁵ Samuel N Dubin et al, 'Transgender Health Care: Improving Medical Students' and Residents' Training and Awareness' (2018) 9 *Advances in Medical Education and Practice* 377, 380; Joshua D Safer, 'Research Gaps in Medical Treatment of Transgender/Nonbinary People' (2021) 131(4) *Journal of Clinical Investigation* 1, 2.

⁶ This is established in Part II(B) of this article.

⁷ Finn et al (n 1) 28.

⁸ See, eg, C E Roselli, 'Neurobiology of Gender Identity and Sexual Orientation' (2018) 30(7) *Journal of Neuroendocrinology* Article No 12562, 2-5; Dubin et al (n 5).

⁹ Elijah Adiv Edelman, 'Gender Identity and Transgender Rights in Global Perspective' in Michael J Bosia, Sandra M McEvoy and Momin Rahman (eds), *The Oxford Handbook of Global LGBT and Sexual Diversity Politics* (Oxford University Press, 2020) 62.

¹⁰ Ibid. For definitions of these identities, and other LGBTIQ+ identities, see Human Rights Campaign, *Glossary of Terms* (31 May 2023) <<https://www.hrc.org/resources/glossary-of-terms>>.

¹¹ See, eg, Morgan Carpenter, 'Fixing Bodies and Shaping Narratives: Epistemic Injustice and the Responses of Medicine and Bioethics to Intersex Human Rights Demands' (2024) 19(1) *Clinical Ethics* 3. Note though that intersex people and their priorities and experiences are not to be conflated with trans and gender diverse identities and experiences. Intersex inclusion is not the focus of this article.

¹² Ibid.

¹³ Jan McArthur, 'Achieving Social Justice Within and Through Higher Education: The Challenge for Critical Pedagogy' (2010) 15(5) *Critical Perspectives* 493, 494–5,

inclusive tertiary education. Finally, it contributes to the literature relating to queering the curriculum by providing examples of what trans-inclusive reproductive health education can look like in both law and science.

Much of the discussion about trans-inclusive pedagogy in this article can be extrapolated beyond the specific context of reproductive health education. This article focuses on the teaching of reproductive health in order to discuss an area which arises in both law and science, allowing for explicit and implicit comparison and a broader understanding of the impact of cisnormativity in higher education.

II BACKGROUND

This part sets out the relevant background information to the matters discussed in this article. It first canvasses the traditional approaches to teaching reproductive health in both science and in law, concluding that both disciplines are heavily influenced by cisnormativity. It then provides a brief overview about how understandings of sex and gender have changed over time.

A Traditional Approaches to Teaching Reproductive Health in Science

In tertiary science education, reproductive health is typically taught in ways that perpetuate cisnormative assumptions. Traditionally, approaches to teaching this topic neither challenge nor critically engage with cisnormative assumptions, even though there is capacity to do so.¹⁴ We identify three key drivers of this cisnormative approach (two of which are discussed in more detail in the sub-parts below). First, the fundamental teaching of sex hormones is routinely tied to understandings of sex and gender. Second, concomitant with the role sex hormones play in development throughout a lifetime, these hormones become all but synonymous with binary forms and anatomy (eg, testosterone = man = penis; oestrogen = woman = vagina). And third, where sexual behaviour and sexuality is explored, teachings are often centred around conception, pregnancy and procreation – typically excluding people with diverse sexualities, genders, and sex characteristics.¹⁵ These practices and understandings are entrenched in many scientific disciplines relevant to reproductive health.¹⁶

1 Fundamental teaching of sex hormones in reproductive health

The focus on sex hormones around sexual development, fertility and conception has been pivotal to deepening understandings of the reproductive system, and this is indispensable to

¹⁴ See generally Sam L Sharpe et al, 'Sex and Biology: Broader Impacts Beyond the Binary' (2023) 63(4) *Integrative and Comparative Biology* 960.

¹⁵ See generally Tuomas Aivelo, Eva Neffling and Maija Karala, 'Representation for Whom? Transformation of Sex/Gender Discussion from Stereotypes to Silence in Finnish Biology Textbooks from 20th to 21st Century' (2024) 58(2) *Journal of Biological Education* 297.

¹⁶ *Ibid.*

teach reproductive biology pragmatically. Throughout secondary and tertiary education, the sex hormones are classically discussed in human biology for their integral and differential roles in development and function of the reproductive systems, anatomy, gender, and fertility.¹⁷ Crucially, a region on the Y chromosome drives testosterone dominance with a 46 XY karyotype (endosex male), whereas the absence of this region and 'Y' chromosome in those with a 46 XX karyotype (endosex female) drives oestrogen dominance, with respective reproductive changes and development directed by the dominant sex hormones.¹⁸ Consequently, oestrogen(s) and testosterone(s) have become synonymous with 'femininity' and 'masculinity', respectively, and this has ingrained them in discourse relating not only to sex, but also to gender.¹⁹ To some extent this is balanced by the following key points on the crucial interplay between sex hormones:

1. Dehydroepiandrosterone is a fundamental precursor hormone in biosynthesis of all sex hormones;²⁰
2. Oestrogens are converted from testosterone and other androgens by the aromatase enzyme;²¹ and
3. All individuals have variable concentrations of all sex hormones – androgens, testosterone and oestrogens.²²

In the teaching of human biology, reproduction-centric cisnormative assumptions are typically made about people and their bodies on the basis of their sex characteristics and sex hormones – eg, bodies are described as either 'male/man' or 'female/woman' on the basis of their characteristics and hormones.²³

2 Pathologising forms beyond the binary

Binary perspectives are entrenched in medical sciences. Anatomy and physiology (form and function) relating to bodies beyond the cisnormative and endosex binary are rarely covered in core scientific or medical education or textbooks.²⁴ When education has paid attention to reproductive variation in forms, this has been historically underscored by a binary lens, and subsequently a pathologising viewpoint.²⁵ For example, one of the most widely used

¹⁷ See, eg, Aivelo, Neffling and Karala (n 15); Katherine Maslowski et al, 'Sex and Fertility Education in England: An Analysis of Biology Curricula and Students' Experiences' (2024) 58(3) *Journal of Biological Education* 702; Katherine Maslowski et al, 'Reproductive Health Education in the Schools of the Four UK Nations: Is it Falling Through the Gap?' (2023) 26(3) *Human Fertility* 527; Fimognari et al (n 4).

¹⁸ Roselli (n 8) 2.

¹⁹ Sari M van Anders, 'Beyond Masculinity: Testosterone, Gender/Sex, and Human Social Behavior in a Comparative Context' (2013) 34(3) *Frontiers in Neuroendocrinology* 198, 199.

²⁰ Stephanie J Webb et al, 'The Biological Actions of Dehydroepiandrosterone Involves Multiple Receptors' (2006) 38(1-2) *Drug Metabolism Reviews* 89, 89.

²¹ Melody V Wu, 'Estrogen Masculinizes Neural Pathways and Sex-Specific Behaviors' (2009) 139(1) *Cell* 61, 61–2.

²² Johanna Olson et al, 'Baseline Physiologic and Psychosocial Characteristics of Transgender Youth Seeking Care for Gender Dysphoria' (2015) 57(4) *Journal of Adolescent Health* 374, 374.

²³ See generally Mel Ferrara and Monica J Casper, 'Genital Alteration and Intersex: a Critical Analysis' (2018) 10 *Current Sexual Health Reports* 1.

²⁴ Jennifer A Hayes and Meredith J Temple-Smith, 'New Context, New Content – Rethinking Genital Anatomy in Textbooks' (2022) 15(5) *Anatomical Sciences Education* 943, 943–4; Aivelo, Neffling and Karala (n 15).

²⁵ Fimognari et al (n 4) 699.

graphical representations of genital variation is the Quigley scale,²⁶ which – whilst depicting a scale between ‘fully masculinised’ and ‘fully feminised’ genitalia – is typically used only in the context of categorising so-called genital ‘anomalies’ and ‘abnormalities’ that sit between the binary forms.²⁷ That is, it implies that the binary male and female forms on either side of the scale are normal, and that anything in between is abnormal.

There is typically only fleeting representation of bodies and identities that do not conform to binary norms in reproductive biology and medical science courses.²⁸ Where there has been representation, this has typically been framed as relating to ‘disorders of sexual development’²⁹ – a term used to refer to variations of sex characteristics (despite being rejected by peak intersex advocacy groups for stigmatising and pathologising intersex people).³⁰ There is generally poor understanding of genital anatomy and variation amongst the public,³¹ creating a need for specialists in anatomy to further develop knowledge and education which presents sex characteristics as a spectrum of features amongst natural variation.³²

B Traditional Approaches to Teaching Reproductive Health in Law

In law schools, reproductive health is typically taught primarily in medical law or health law units.³³ These units are often seen as an intersection between medicine and law,³⁴ and thus, the teaching and curricula in these units has been shaped by traditions in both medical science and law.³⁵ In this way, the traditional approach to teaching reproductive health in science – as discussed above – has had a profound impact on the way that reproductive health has been taught in law schools. That is to say that much of the discussion set out in the preceding sub-part applies equally in the context of legal studies.

Of course, though, legal traditions have also shaped the way that reproductive health has been taught in law schools. As is the case with science, law as a discipline (and indeed, the

²⁶ Charmian A Quigley et al, 'Androgen Receptor Defects: Historical, Clinical, and Molecular Perspectives' (1995) 16(3) *Endocrine Reviews* 271.

²⁷ Ibid.

²⁸ See, eg, Luke Uden, Vanessa Vaughan and Helen Wilcox, 'Building Gender and Sexual Diversity into Case-based Learning' (2024) 25(4) *Focus on Health Professional Education* 17, 17–18.

²⁹ Tove Lundberg, Peter Hegarty and Katrina Roen, 'Making Sense of 'Intersex' and 'DSD': How Laypeople Understand and use Terminology' (2018) 9(2) *Psychology & Sexuality* 161, 162.

³⁰ InterAction for Health and Human Rights, *Media and Style Guide* (2 March 2021) <<https://interaction.org.au/style/>>.

³¹ Rebecca Beni, Lauren Fisher and Georga J Longhurst, 'The Importance of Diverse and Accurate Descriptions of Genital Anatomy in Textbooks' (2022) 15(5) *Anatomical Sciences Education* 985, 985–6.

³² Goran Štrkalj and Nalini Pather, 'Beyond the Sex Binary: Toward the Inclusive Anatomical Sciences Education' (2020) 14(4) *Anatomical Sciences* 513, 514–15.

³³ See, eg, Susan B Apel, 'Teaching Health Law: Teaching Law and Medicine on the Interdisciplinary Cutting Edge: Assisted Reproductive Technologies' (2010) 38(2) *Journal of Law, Medicine & Ethics* 420. Note though that aspects of reproductive health may be taught in other units like Criminal Law and Family Law.

³⁴ See generally Scott Burris et al, 'Moving from Intersection to Integration: Public Health Law Research and Public Health Systems and Services Research' (2012) 90(2) *The Milbank Quarterly* 375.

³⁵ Ibid.

law itself)³⁶ has traditionally been cisnormative and heteronormative in nature.³⁷ This has shaped the language used in case law and statutes,³⁸ the law school curriculum,³⁹ and dominant attitudes within the legal profession.⁴⁰ For example, a 2022 study relating to LGBTQI+ diversity in legal education found that participating LGBTQI+ law students thought the law curriculum was not particularly inclusive of LGBTQI+ people in general, and that sources (like textbooks) and law teachers could make a greater effort to use gender-neutral language.⁴¹

Indeed, legal education often reinforces the binary and cisnormativity by framing reproductive health laws predominantly around the experiences of cisgender women. For example, discussions surrounding abortion rights and access to contraception are typically centred on cisgender women's bodies and experiences. This framing excludes transgender men, non-binary and gender diverse people, as well as some intersex people who may also require reproductive health care but face distinct legal and medical barriers. This framing in legal education is influenced by the law itself, with statutes and case law typically using gendered and binary language, such as references to 'women' and 'mothers',⁴² failing to acknowledge the diverse identities of people who can become pregnant or require reproductive healthcare. This exclusion perpetuates a legal framework that marginalises transgender and gender diverse people.⁴³

In conclusion, in Western cultures, both law and medical science have been profoundly impacted by cisnormativity. The result of two historically cisnormative disciplines colliding is that these biases and expectations have become doubly entrenched in the teaching of health law.⁴⁴

C Understandings of Sex and Gender over Time

This sub-part provides a brief and selective overview of how sex and gender have been understood over time. First, it provides a number of examples to demonstrate that trans and gender diverse identities are not new phenomena, despite common misconceptions. It then

³⁶ Paula Gerber and Ronli Sifris, 'Erasing Trans People: How to Ensure Australia Does Not Go Down the Same Path as the United States' (2024) 49(4) *Alternative Law Journal* 249, 250–1.

³⁷ See, eg, Stevie Leahy, 'Fostering Equity and Inclusion Across the Gender Spectrum in the Law School Classroom' (2020) 65(5) *Villanova Law Review* 1105; Paula Gerber and Claerwen O'Hara, 'Teaching Law Students about Sexual Orientation, Gender Identity and Intersex Status within Human Rights Law: Seven Principles for Curriculum Design and Pedagogy' (2019) 68(2) *Journal of Legal Education* 416.

³⁸ Florence Ashley, 'The Constitutive In/Visibility of the Trans Legal Subject: A Case Study' (2021) 28(1) *UCLA Women's Law Journal* 423, 424, 435.

³⁹ Mark Israel et al, 'Fostering "Quiet Inclusion": Interaction and Diversity in the Australian Law Classroom' (2017) 66(2) *Journal of Legal Education* 332, 341–44.

⁴⁰ Aidan Ricciardo et al, 'Perceptions of LGBTQI+ Diversity in the Legal Profession: "It's Happening Slow, but it's Certainly Happening"' (2021) 46(2) *Alternative Law Journal* 100, 101–5.

⁴¹ Aidan Ricciardo et al, 'Understanding, Promoting and Supporting LGBTQI+ Diversity in Legal Education' (2022) 56(3) *The Law Teacher* 307, 318–9.

⁴² Eg, in Western Australia the statutory provisions relating to abortion referred only to a 'woman's' ability to access an abortion until 2023.

⁴³ Anniken Sørli, 'Trans Reproduction: Continuity, Cis-normativity, and Trans Inequality in Law' (2023) 21(2) *International Journal of Constitutional Law* 625, 642.

⁴⁴ That is, the heteronormativity and cisnormativity in science provides validation for the heteronormativity and cisnormativity in law, and vice versa.

considers how medical and biological sciences have played a role in entrenching cishnormative understandings of human bodies (especially in Western cultures). Following that, it looks at the other side of that same coin, touching on some developments in science that challenge those cishnormative understandings. Finally, it briefly notes how in contemporary times, there has been less pathologisation and greater acceptance of trans and gender diverse people.

1 Trans and gender diverse identities are not 'new' phenomena

In Western cultures, trans and gender diverse identities are often thought of as relatively new phenomena.⁴⁵ However, there are many historical (and in many cases, enduring) examples of gender diversity in many cultures over the world. This is especially apparent in a number of Indigenous cultures where diverse understandings of sex and gender predated colonisation. These examples frame the binary understanding of human bodies as an introduced system of ideas and concepts which does not fully reflect established sociocultural structures and histories.

One example is discussed in work by Oyèrónké Oyěwùmí on Yoruba cultural knowledge and gender origins.⁴⁶ Oyěwùmí positions generational reproduction at the core of Yoruba society, upheld by social categories which were not gendered, gender-exclusive, or biologically determined, and which preceded colonisation.⁴⁷ A common framework in imperialist societies opposes these notions – instead, assuming that sex determines gender, which in turn determines the social categories that coordinate generational reproduction.⁴⁸ Yoruba culture offers one example to challenge these imperialist assumptions, but it is not the only example.

As further examples, non-binary identities are present in many Indigenous cultures. Amongst some Polynesian peoples, such as in Hawaii, the term 'māhū' is used to refer to individuals who do not embody the exclusive qualities ascribed to any one of the binary genders as understood within the communities, and may identify as a third gender.⁴⁹ This third gender is often described as encompassing a mixture of conventionally gendered features and traits, or not embodying gendered traits at all.⁵⁰ Non-binary identities are also present in Oaxaca (Mexico), especially in Zapotec cultures, by people who identify as 'Muxe' – individuals who do not conform to traditional gender roles,⁵¹ and who have integral roles

⁴⁵ Phillip L Hammack and Adriana M Manago, 'The Psychology of Sexual and Gender Diversity in the 21st Century: Social Technologies and Stories of Authenticity' (2024) *American Psychologist* (online ahead of print).

⁴⁶ Oyèrónké Oyěwùmí, 'Conceptualizing Gender: The Eurocentric Foundations of Feminist Concepts and the Challenge of African Epistemologies' (2002) 2(3) *Jenda: A Journal of Culture and African Women Studies* 1.

⁴⁷ Ibid 3.

⁴⁸ Maria Lugones, 'The Coloniality of Gender' in Wendy Harcourt (ed), *The Palgrave Handbook of Gender and Development: Critical Engagements in Feminist Theory and Practice* (Palgrave Macmillan, 2016) 13, 14–15.

⁴⁹ Rachel Beth Chapman, *Mahu and Native Hawaiian Culture: Experiences of Non-Heteronormativity* (Dissertation, 2023) <<https://scholarsarchive.byu.edu/etd/10084>> 3.

⁵⁰ Makiko Kuwahara, 'Living as and Living with Māhū and Raerae: Geopolitics, Sex and Gender in the Society Islands' in Niko Besnier and Kalissa Alexeyeff (eds), *Gender on the Edge: Transgender, Gay, and Other Pacific Islanders* (University of Hawai'i Press, 2014) 93, 94.

⁵¹ Jacobo Ramirez and Ana María Munar, 'Hybrid Gender Colonization: The Case of Muxes' (2022) 29(6) *Gender, Work & Organization* 1868, 1868; Alejandra Gall Peña, *Reflections and Conceptions of Muxe Gender Identity in Contemporary Mexican Society* (Dissertation, 2022) <<https://www.diva-portal.org/smash/get/diva2:1675237/FULLTEXT01.pdf>> 2.

in society alongside 'women' and 'men'.⁵² In many Indigenous North American nations, gender is understood to be on a continuum, and these societies embrace gender non-conforming individuals who are referred to as 'Two-spirit'.⁵³ There are also social categories with long histories which extend beyond a 'third' gender.⁵⁴

The brief overview of gender diversity in cultural histories in this Part is nowhere close to comprehensive, and further diversity exists.⁵⁵ But what is apparent from this brief overview is that gender diversity has been accepted in many cultural traditions for a long time, transcending Western understandings of gender and sex that position gender diversity as a new phenomenon.⁵⁶ What is also apparent from this overview is the relationship between colonisation and Western globalisation on the one hand, and understandings of sex and gender in many non-Western and Indigenous cultures on the other. When we consider that institutional teaching on reproductive health, sex and gender has largely ignored the reality of diverse genders,⁵⁷ these tertiary institutions can be understood as perpetuating colonial values and norms.⁵⁸

2 The role of medical and biological science in entrenching cisnormativity

While developments in medical and biological science have undoubtedly contributed to advancements in human health, the proliferation of this knowledge over the 19th and 20th centuries also perpetuated essentialist views that oversimplify and restrict the complexity of human identity.⁵⁹ The roots of essentialist views can be traced to early medical perspectives that linked gender directly to anatomical features,⁶⁰ and designated certain traits in association.⁶¹ These perspectives reinforced a binary understanding of sex, associating specific traits and roles with male and female bodies. Biology has provided a foundation for a binary outlook on sex and gender. Gendered associations with sex and sex hormones extend to gametes: sperm ('men') and eggs ('women').⁶² As the base biological requirement for sexual reproduction in humans is the fusion of gametes, science has been used to ground

⁵² Alfredo Mirande, *Behind the Mask: Gender Hybridity in a Zapotec Community* (Tucson: The University of Arizona Press, 2017) 10.

⁵³ John R Sylliboy, 'Coming Out is Part of the Life Cycle: A Qualitative Study Using Two-Eyed Seeing to Understand a Two-Spirits Coming Out Process' (2022) 17(10) *Global Public Health* 2428, 2428–30.

⁵⁴ Sharyn Davies, *Challenging Gender Norms: Five Genders Among Bugis in Indonesia* (Gale Cengage, 2007) x, 9.

⁵⁵ See generally Emmie Matsuno and Stephanie L Budge, 'Non-binary/Genderqueer Identities: a Critical Review of the Literature' (2017) 9(1) *Current Sexual Health Reports* 116.

⁵⁶ Volkmar Sigusch, 'On Cultural Transformations of Sexuality and Gender in Recent Decades' (2004) 2 *German Medical Science* 1.

⁵⁷ See generally Lugones (n 48) 13–33.

⁵⁸ See generally Juliana McLaughlin and Susan Whatman, 'The Potential of Critical Race Theory in Decolonising University Curricula' (2011) 31(4) *Asia Pacific Journal of Education* 365.

⁵⁹ See generally Ash T Zemenick et al, 'Six Principles for Embracing Gender and Sexual Diversity in Postsecondary Biology Classrooms' (2022) 72(5) *BioScience* 481.

⁶⁰ See generally, Hayes and Temple-Smith (n 24); Štrkalj and Pather (n 32).

⁶¹ Hayes and Temple-Smith (n 24); Štrkalj and Pather (n 32); A M Aramati Casper et al, "'It's completely erasure": A Qualitative Exploration of Experiences of Transgender, Nonbinary, Gender Nonconforming, and Questioning Students in Biology Courses' (2022) 21(4) *CBE Life Sciences Education* Article No 69, 1–2.

⁶² Katrina Karkazis, 'The Misuses of "Biological Sex"' (2019) 394(10212) *The Lancet* 1898, 1898–9.

binary and cisnormative understandings of human bodies, and this is so despite sex – in terms of reproduction – not being clearly linked to the concept of gender.⁶³

Early advances in genetics led to the identification of sex chromosomes and associated them with dominant sex hormone profiles, reinforcing the idea that sex is a strictly binary, biologically-determined characteristic, with associated binary forms.⁶⁴ Historical (and, in some cases, enduring) medical practices reflect both a pattern of diagnosing pathology and chromosomal aberrations, and a tendency to model binary understandings of human bodies and identities. For example, non-consensual sex assignment surgeries performed on intersex infants and children exemplify an emphasis on assigning a fixed binary gender based on anatomical features.⁶⁵ Another example is provided by the inclusion of gender identity disorders in psychiatric diagnostic classifications, which until recently pathologised transgender and gender diverse people.⁶⁶ Both examples have arguably arisen from essentialist cisnormative and endosexnormative views,⁶⁷ and may self-perpetuate these views within a gender-binary cycle,⁶⁸ preventing meaningful mainstream discourse about diverse gender identities within the scientific community, and society at large.⁶⁹

3 Developments in science that challenge cisnormative understandings

Although (as set out above) science has played a role in entrenching cisnormative views of sex and gender, there have also been a number of developments and discoveries in science that have challenged those cisnormative understandings.

For example, research in biology has revealed examples of many organisms that require more than two individuals to reproduce,⁷⁰ are not constrained or even correctly represented by binary sex,⁷¹ and that do not have a fixed 'biological' sex.⁷² Further examples and concepts

⁶³ See generally Arnold de Loof, 'Only Two Sex Forms but Multiple Gender Variants: How to Explain?' (2018) 11(1) *Communicative and Integrative Biology* e142739. This point is explored further later in this article.

⁶⁴ Institute of Medicine (US) Committee on Understanding the Biology of Sex and Gender Differences, 'Every Cell has a Sex' in Theresa M Wizemann and Mary-Lou Pardue (eds), *Exploring the Biological Contributions to Human Health: Does Sex Matter?* (National Academies Press, 2001).

⁶⁵ See generally, Peter Hegarty and Annette Smith, 'Public Understanding of Intersex: An Update on Recent Findings' (2023) 35 *International Journal of Impotence Research* 72; Aidan Ricciardo, 'Harm Caused by Medical Interventions which Alter Intersex Variations: Can Negligence Provide a Remedy' (2021) 40(2) *University of Tasmania Law Journal* 91, 94–113.

⁶⁶ Rebeca Robles, Tania Real and Geoffrey M Reed, 'Depathologizing Sexual Orientation and Transgender Identities in Psychiatric Classifications' (2021) 2(2) *Consortium Psychiatricum* 45, 46–51.

⁶⁷ Ricciardo (n 65) 94–113; Amets Suess Schwend, 'Trans Health Care from a Depathologization and Human Rights Perspective' (2020) 41 *Public Health Reviews* Article No 3, 12; Keely Duggan and Donna McNamara, 'The Blurred Distinction Between Therapeutic and Non-therapeutic Medical Interventions for Intersex Children in Australia' (2021) 27(2) *Australian Journal of Human Rights* 272.

⁶⁸ Tamar Saguy, Michal Reifen-Tagar and Daphna Joel, 'The Gender-Binary Cycle: The Perpetual Relations Between a Biological-Essentialist View of Gender, Gender Ideology, and Gender-Labeling and Sorting' (2021) 376(1882) *Philosophical Transactions of The Royal Society B Biological Sciences* Article No 20200141, 5.

⁶⁹ See generally Baqar Husain, *Stigma, Cisgenderism, And the Pathologization Of Transness* (Dissertation, 2022) <<https://elischolar.library.yale.edu/ysphtdl/2159/>>; Suess Schwend (n 67).

⁷⁰ John Whitfield, 'Everything You Always Wanted to Know about Sexes' (2004) 2(6) *PLoS Biology* 718, 718–19, 721.

⁷¹ J F McLaughlin et al, 'Multivariate Models of Animal Sex: Breaking Binaries Leads to a Better Understanding of Ecology and Evolution' (2023) 63(4) *Integrative and Comparative Biology* 891, 896–7.

⁷² Joan Roughgarden, *Evolution's Rainbow Diversity, Gender, and Sexuality in Nature and People* (University of California Press, 2013) 169–71.

have been extensively discussed in a recent essay by Goymann, Brumm & Kappeler,⁷³ although many of these discoveries have been well established for decades. Thus, despite traditional cisnormative expectations of *human* bodies, the binary is not unanimous amongst all life forms.

Looking to our common living ancestors, gender and sexuality in many primate species are not determined exclusively by 'biological sex'. Many non-reproductive interactions and sexual behaviours in primates are driven by socialisation,⁷⁴ occur outside of our heteronormative understandings of gender, sexuality and sexual behaviour,⁷⁵ and do not show significant association with gender.⁷⁶ As put by Burton in relation to non-human primates, 'If the hormones determine the roles, one would expect to find the same sex occupying the same role in all societies'.⁷⁷ A substantial body of literature now supports the view that in humans, identity is determined by a combination of genetic, hormonal and environmental factors,⁷⁸ and that it is also profoundly influenced by social structures, and in accordance with how gender and sex are modelled in our homes and societies.⁷⁹

Cisnormative views of sex are also challenged by the relationship between gametes and sexual behaviours. As discussed by de Loof, the number of gamete types (ie, two: sperm and eggs) do not directly correspond with the number of sexual behaviours and identities (which are considerably more numerous).⁸⁰ That is, gametic sex and sex hormones do not unilaterally determine sexual behaviours (eg, sexuality). While some genetic and heritable attributions to non-binary expression of sex are known, evidence suggests that epigenetic switching (turning off and on of certain genes) is significantly deterministic in sexual differentiation.⁸¹ This is not purely dependent on genetic or hormonal factors known to regulate sexual development and identity,⁸² but can be shaped by life experiences inconsequential to 'biological sex',⁸³ which are highly variable throughout a person's life,⁸⁴ let alone throughout different brain regions.⁸⁵ This suggests that binary extrapolations cannot

⁷³ See generally, Wolfgang Goymann, Henrik Brumm and Peter M Kappeler, 'Biological Sex is Binary, Even Though There is a Rainbow of Sex Roles: Denying Biological Sex is Anthropocentric and Promotes Species Chauvinism' (2023) 45(2) *Bioessays* e2200173.

⁷⁴ Alan Dixon, 'Primate Sexuality' in *The International Encyclopedia of Human Sexuality* (Wiley, 2015) 861, 867–9.

⁷⁵ Andrew B Barron and Brian Hare, 'Prosociality and a Sociosexual Hypothesis for the Evolution of Same-Sex Attraction in Humans' (2020) 10 *Frontiers in Psychology* Article No 2955, 2.

⁷⁶ Michelle Rodrigues and Emily Boeving, 'Comparative Social Grooming Networks in Captive Chimpanzees and Bonobos' (2018) 60(3) *Primates* 191, 191–2.

⁷⁷ Frances D Burton, 'Ethology and the Development of Sex and Gender Identity in Non-human Primates' (1977) 26(1) *Acta Biotheoretica* 1, 14.

⁷⁸ See generally Roselli (n 8).

⁷⁹ Elizabeth Barr et al, 'Gender as a Social and Structural Variable: Research Perspectives from the National Institutes of Health (NIH)' (2024) 14(1) (2023/04/19) *Translational Behavioral Medicine* 13, 13–14.

⁸⁰ De Loof (n 63) 1.

⁸¹ Nancy G Forger, 'Epigenetic Mechanisms in Sexual Differentiation of the Brain and Behaviour' (2016) 371(1688) *Philosophical Transactions of The Royal Society B Biological Sciences* Article No 20150114, 1.

⁸² Ceri Weber and Blanche Capel, 'Sex Determination Without Sex Chromosomes' (2021) 376(1832) *Philosophical Transactions of The Royal Society B Biological Sciences* Article No 20200109, 1–2.

⁸³ Laura R Cortes, Carla D Cisternas and Nancy G Forger, 'Does Gender Leave an Epigenetic Imprint on the Brain?' (2019) 13 *Frontiers in Neuroscience* Article No 173, 5.

⁸⁴ Marija Kundakovic and Maria Tickerhoof, 'Epigenetic Mechanisms Underlying Sex Differences in the Brain and Behavior' (2024) 47(1) *Trends in Neurosciences* 18, 1–3.

⁸⁵ Weber and Capel 82) 1.

reliably be drawn from sex hormones and gametes, thus providing analogical support for understanding concepts of sex and gender as not inherently linked.

Key evidence for challenging classical and reductive associations between gender, genitals, and identity is provided by 'Guevedoces' in the Dominican Republic. This population has a genetic mutation which impairs the conversion of testosterone to dihydrotestosterone (DHT), a hormone previously thought to be singularly deterministic in male genital differentiation in utero.⁸⁶ All individuals with this mutation have vulvas, are assigned female at birth (AFAB) and raised as 'girls', but undergo significant genital changes during puberty in the absence of DHT, with their genitals transitioning from vulvas to penises. Despite being raised with traditional AFAB conventions, many identify differently in adulthood,⁸⁷ challenging rigid notions of gender identity. This example recapitulates that gender is not fixed at birth but is a construct; shaped by various biological, social, societal and cultural factors.⁸⁸

Genital and gender diversity are often viewed through a binary, essentialist and procreative lens, and this skews perceptions of some naturally occurring variations that do not necessarily indicate pathology. For example, around 17.5% of people are considered infertile according to the World Health Organisation,⁸⁹ yet this statistic predominantly reflects the impaired fertility of cisgender and heterosexual couples trying to reproduce, whilst queer, gender and genital diverse individuals are largely excluded, and classed as 'socially infertile'.⁹⁰ However, the most recent preclinical advances demonstrate how modern technologies can produce offspring from two of the same gamete,⁹¹ supporting the potential for same-sex and gender diverse people to access assistive reproductive technologies in the future. Most importantly, this shows that procreation is possible outside of traditional binary conventions. These examples challenge the binary, essentialist and procreative framework. Directly challenging this framework can lead to a broader understanding of what constitutes natural variation of sex and gender, beyond the essentialist procreative lens, emphasising that gender and sex characteristics do not fit neatly into fixed, predetermined structures.⁹²

4 Greater acceptance of transgender and gender diverse people: contemporary challenges to medicalised models

Following on from the entrenching of cisnormative essentialism covered above, in more contemporary times there has been growing (though certainly not unanimous) recognition within societies that gender diversity is a reality, and that it is part of the natural diversity of

⁸⁶ See generally, Julianne Imperato-McGinley et al, 'Androgens and the Evolution of Male-Gender Identity among Male Pseudohermaphrodites with 5 α -Reductase Deficiency' (1979) 300(22) *New England Journal of Medicine* 1233.

⁸⁷ Ibid.

⁸⁸ Barr et al (n 79).

⁸⁹ World Health Organization, *Infertility Prevalence Estimates: 1990–2021* (Report, 2023) xi.

⁹⁰ Erika Maxwell, Maria Mathews and Shree Mulay, 'More Than a Biological Condition: The Heteronormative Framing of Infertility' (2019) 1(2) *Canadian Journal of Bioethics* 63, 63.

⁹¹ Zhi-Kun Li et al, 'Adult Bi-paternal Offspring Generated Through Direct Modification of Imprinted Genes in Mammals' (2025) *Cell Stem Cell* (online ahead of print).

⁹² L Zachary DuBois and Heather Shattuck-Heidorn, 'Challenging the Binary: Gender/Sex and the Bio-logistics of Normalcy' (2021) 33(5) *American Journal of Human Biology* e236223.

humankind.⁹³ This shift has also occurred within medical and scientific communities specifically, with efforts to de-pathologise trans and gender diverse identities and provide affirming healthcare.⁹⁴

Feminism(s), queer studies, and LGBTIQ+ activism have paved the way for broader acceptance of transgender and gender diverse identities,⁹⁵ with a number of studies from the past decade indicating general acceptance of transgender people,⁹⁶ though with variation between nations.⁹⁷ Indeed, there is no doubt that despite increased acceptance, considerable stigma, persecution, and transphobia continue to exist and affect transgender and gender diverse people.⁹⁸

III WHY WE SHOULD TEACH REPRODUCTIVE HEALTH INCLUSIVELY

This Part argues that as teachers who cover reproductive health, we have a duty to teach it in a way that is inclusive of trans and gender diverse people. We propose that this duty arises from a number of sources. First, we apply critical pedagogy to this topic and consider the duties arising from that theoretical approach. Second, we consider the duties we owe to others – namely, our students and the communities they will serve in their future professions. Third, we consider the duty we owe to ourselves as teachers – a duty to teach authentically and accurately.

A Critical Pedagogy and the Imperative for Inclusive Education

This article adopts the theoretical paradigm of critical pedagogy to argue that as teachers covering reproductive health, we have a duty to do so inclusively. Critical pedagogy is an educational approach rooted in critical theory, particularly associated with the work of Paulo Freire.⁹⁹ It focuses on challenging oppressive power structures, fostering critical thinking,

⁹³ Jhon Alexander Moreno et al, 'A Brief Historic Overview of Sexual and Gender Diversity in Neuroscience: Past, Present, and Future' (2024) 18 *Frontiers in Human Neuroscience* Article No 1414396, 3–6.

⁹⁴ Suess Schwend (n 67). Note though that this has not been a universal experience – see, eg, Gerber and Sifris (n 36).

⁹⁵ See generally Wendy Cumming-Potvin, 'LGBTQA+ Allies and Activism: Past, Present and Future Perspectives' (2024) 38(3) *Continuum* 338. There have been many legal dimensions to this LGBTIQ+ activism, including strategic litigation, advocacy for legislative reform, and broader campaigns for systemic change.

⁹⁶ Hannah Morgan et al, *Attitudes to Transgender People* (Equality and Human Rights Commission Research Report, 2020) 3–4

<https://www.equalityhumanrights.com/sites/default/files/attitudes_to_transgender_people.pdf>.

⁹⁷ Ipsos Public Affairs, *Global Attitudes Toward Transgender People* (Report, 2018)

<https://www.ipsos.com/sites/default/files/ct/news/documents/2018-01/ipsos_report-transgender_global_data-2018.pdf>.

⁹⁸ Jaclyn M White Hughto, Sari L Reisner and John E Pachankis, 'Transgender Stigma and Health: A Critical Review of Stigma Determinants, Mechanisms, and Interventions' (2015) 147 *Social Sciences and Medicine* 222, 228–9.

⁹⁹ Paulo Freire, *Pedagogy of the Oppressed*, tr Myra Bergman Ramos (Continuum, 30th Anniversary ed, 2005); Henry A Giroux, *On Critical Pedagogy* (Bloomsbury, 2nd ed, 2020).

and promoting social justice within educational settings.¹⁰⁰ At its core, critical pedagogy seeks to engage learners in a process of conscientisation, which involves critically analysing societal norms, inequalities, and power dynamics to develop a deeper understanding of the world.¹⁰¹

Critical pedagogy is deeply concerned with social justice and equity, aiming to dismantle oppressive structures and inequalities, advocating for inclusion, fairness, and respect for diverse identities.¹⁰² Importantly, critical pedagogy encourages teachers to strive towards these goals by teaching with a social justice agenda.¹⁰³ Educators are encouraged to inspire learners to become agents of change in their communities: the goal is to motivate individuals to engage in transformative action, challenging injustice and promoting equity.¹⁰⁴ In summary, critical pedagogy asserts that values like equity and justice should be inherent in education, and that it is not improper for educators to teach with an agenda of justice.¹⁰⁵

Applying this theoretical approach to the present topic, critical pedagogy gives licence to fostering a more trans-inclusive and respectful learning environment in the teaching of reproductive health.

Critical pedagogy encourages questioning and deconstructing societal norms, including traditional assumptions about sex and gender.¹⁰⁶ In this way, in the context of reproductive health, critical pedagogy encourages ways of learning and teaching that acknowledge and respect the diversity of sex and gender beyond conventional binaries and expectations.

Following critical pedagogy, learners are encouraged to critically examine the implications of power structures and advocate for inclusivity, paying particular attention to injustices and how they can be remedied.¹⁰⁷ Accordingly, students can be encouraged to recognise power dynamics that have historically marginalised trans and gender diverse people in reproductive health contexts, and in traditional understandings of reproductive biology. Students can be encouraged to identify gaps in policy and practice and advocate for reforms that recognise and protect the reproductive rights of transgender and non-binary people.

Overall, an approach based on critical pedagogy encourages students and teachers to critically examine existing knowledge, challenge biases, and advocate for more equitable and

¹⁰⁰ Peter McLaren, 'Critical Pedagogy: A Look at the Major Concepts' in Antonia Darder et al (eds), *The Critical Pedagogy Reader* (Routledge Falmer, 2002) 69, 78, 89; Michelle L Page, 'LGBTQ Inclusion as an Outcome of Critical Pedagogy' (2016) 7(1) *International Journal of Critical Pedagogy* 115, 116–17; Lauren B Clark, 'Critical Pedagogy in the University: Can a Lecture be Critical Pedagogy?' (2018) 16(8) *Policy Futures in Education* 985, 996–7.

¹⁰¹ Freire (n 99) 104–10; 159–60.

¹⁰² Page (n 100) 116; McArthur (n 13) 494–6.

¹⁰³ David W Stinson, Carla R Bidwell and Ginny C Powell, 'Critical Pedagogy and Teaching Mathematics for Social Justice' (2012) 4(1) *The International Journal of Critical Pedagogy* 76, 77–9; McArthur (n 13) 494–5; Clark (n 100) 996–8.

¹⁰⁴ Page (n 100) 116–17, 135–6; McLaren (n 100) 78–89.

¹⁰⁵ Indeed, this is encouraged. See generally Douglas Bourn, 'Teachers as Agents of Social Change' (2016) 7(3) *International Journal of Development Education* 63.

¹⁰⁶ Wayne Martino and Kenan Omercajic, 'A Trans Pedagogy of Refusal: Interrogating Cisgenderism, the Limits of Antinormativity and Trans Necropolitics' (2021) 29(5) *Pedagogy, Culture & Society* 679, 681–90; Eli Kean, 'Advancing a Critical Trans Framework for Education' (2021) 51(2) *Curriculum Inquiry* 261, 262–7.

¹⁰⁷ Freire (n 99) 80–1; Clark (n 100) 997–8.

inclusive approaches.¹⁰⁸ This can be applied readily to the context of reproductive health, and is consistent with teaching reproductive health in a way that is inclusive of trans and gender diverse people. Indeed, as Miller states, 'because gender, sexual, and other forms of social hierarchy are reproduced and regulated through discourse and social institutions, those institutions can and must be changed for the better'.¹⁰⁹

Opponents of critical pedagogy might assert that educators should be neutral in their teaching: that it is not a teacher's role to transmit values or influence beliefs.¹¹⁰ But it is worth interrogating what is meant by, and the factors that underpin, 'neutrality'. As a simple example, critics may regard a teacher's use of trans-inclusive language (eg, 'pregnant people' instead of 'pregnant women') as a value-laden and non-neutral choice. However, this critique would fail to recognise that using non-inclusive language is every bit as much of a choice – neither option is inherently neutral. As put by Shaull, 'there is no such thing as a neutral educational process'.¹¹¹ Perceptions of neutrality are subjective and shaped by cisnormative societal attitudes.¹¹² In reality, no one choice is truly neutral, and if both options are non-neutral choices, there is much to be said for making the choice that promotes inclusion and equity.¹¹³

B Duty to Others

We contend that we should teach reproductive health in a trans-inclusive way because we owe duties to others to do so – namely, our students and those who our students will interact with in their professional lives. Though not disconnected from critical pedagogy, this duty justifies explicit discussion.

As set out by Ricciardo et al in a study of LGBTQI+ diversity in legal education, there is a pressing need to teach our students about diverse people and their experiences, including in relation to transgender and gender diverse people:

The academic literature on legal education emphasises the need to teach law students about diversity, including issues relating to gender identity and sexual orientation. That literature suggests that this prepares the wider student cohort for the diversity of their future clients and their legal problems, and that it makes students better problem-solvers. Including these issues also situates the law curriculum within the wider, societal normative concerns of civil and criminal justice.¹¹⁴

¹⁰⁸ Freire (n 99) 80–1; Clark (n 100) 997–8; Page (n 100) 116; McArthur (n 13) 494–6.

¹⁰⁹ Jennifer Miller, 'Thirty Years of Queer Theory' in Deborah P Amory et al (eds) *Introduction to LGBTQ+ Studies: A Cross-Disciplinary Approach* (State University of New York Press, 2022) chapter 1. See also, Eli Kean, 'Advancing a Critical Trans Framework for Education' (2021) 51(2) *Curriculum Inquiry* 261.

¹¹⁰ See generally Peter Gardner, 'Neutrality in Education' in Robert Goodin and Andrew Reeve (eds) *Liberal Neutrality* (Routledge, 1989).

¹¹¹ Richard Shaull, preface to Freire (n 99) 34.

¹¹² Gerber and O'Hara (n 37) 421, 452.

¹¹³ See generally Julie Taylor, 'Education Can Never be Neutral — Teaching for Subversion' (1993) 13(1) *Nurse Education Today* 69.

¹¹⁴ Ricciardo et al (n 41) 330.

Indeed, as previously put by the now Sex Discrimination Commissioner, Anna Cody, the 'lived experiences of clients [affect] how they interact with the law. To be good lawyers we must be able to listen to and understand our diverse clients.'¹¹⁵ These sentiments can be applied equally to graduates from health and science degrees, as well as the clients they will encounter in their careers.¹¹⁶

In short, in order to equip our students to deal with the diversity of clients and communities they will encounter in their careers, we need to teach them about that diversity (and how to navigate it inclusively and respectfully) in their tertiary studies.¹¹⁷ This can even be conceptualised as part of an educator's duty to ensure that course content is relevant and up to date.

Relatedly, educators should also strive to make course content relevant to their students and their lives.¹¹⁸ Of course, it is also a reality that our students themselves may be just as diverse as the clients and communities they will come to serve.¹¹⁹ It is an undeniable fact that trans and gender diverse students are in our universities.¹²⁰ Thus, for reasons quite apart from their future careers, we owe it to our students to teach with that diversity in mind, making choices that include (rather than alienate) them. In the context of teaching about reproductive health, it is also worth considering that some of our students will have a personal stake in learning information relating to trans and gender diverse people, and having access to content that is relevant to their own bodies and experiences is important to them. Failing to teach that content, or failing to teach it in an inclusive way, only contributes to any existing invisibility and inaccessibility of that information.

To recognise the diversity – including gender diversity – of student cohorts is also to recognise the diverse experience and expertise that our students bring to their classes. It is to recognise that students themselves – including trans and gender diverse students – can contribute to class discussions and course content on the basis of their experiences, knowledge and identities (eg, by speaking on the basis of lived experience or identifying gaps in course content). In doing so, we are able to engage our diverse students not only as passive learners, but also as stakeholders who co-construct the learning journeys that take place in our classes. This is consistent with the dialogical problem-posing process central to critical pedagogy, whereby all classroom participants – including students – are involved in 'teaching'.¹²¹

¹¹⁵ Anna Cody, 'The Importance of Diversity in our Profession' (2019) 154 *Precedent* 2, 2.

¹¹⁶ See, eg, Uden, Vaughan and Wilcox (n 28) 18–19.

¹¹⁷ Cody (n 115) 2.

¹¹⁸ Clark (n 100) 986, 997; Page (n 100) 122.

¹¹⁹ Samantha Marangell et al, 'Students' Attitudes Toward Diversity in Higher Education: Findings from a Scoping Review' (2024) 34(1) *Issues in Educational Research* 97, 97–8.

¹²⁰ See generally Australian Bureau of Statistics, *Estimates and Characteristics of LGBTI+ Populations in Australia: Data on gender, trans and gender diverse, sexual orientation, and people born with variations of sex characteristics* (2024) <<https://www.abs.gov.au/statistics/people/people-and-communities/estimates-and-characteristics-lgbti-populations-australia/latest-release>>; Jennifer L Marino et al, 'Sexuality and Gender Diversity Among Adolescents in Australia, 2019–2021' (2024) 7(10) *JAMA Network Open* e2444187.

¹²¹ Freire (n 99) 72, 80.

C Duty to Ourselves as Teachers

As set out above, there is no 'neutral' option when it comes to teaching reproductive health in a trans-inclusive way. On a simplified view, there are two options: either take steps to teach it inclusively, or don't. Each of these options is a choice and neither is neutral. We argue that when presented with these options, we owe a duty to ourselves as teachers of reproductive health to be guided by critical pedagogy and choose the option that best promotes justice and equality.¹²²

Choosing to teach reproductive health in a trans-inclusive way is not only consistent with justice and equality – it is also consistent with the values held by many teachers who (like the authors of this article) strive to create inclusive classroom environments and support trans and gender diverse rights. By making choices that align with our values, we are able to be more authentic teachers. Relevantly, there is a body of scholarship which supports teaching with authenticity.¹²³ Whilst authenticity in teaching has been described as a 'multifaceted concept',¹²⁴ it includes (amongst other things) genuineness and acting in a way that is consistent with one's values, beliefs, and feelings.¹²⁵

The relevant literature establishes that authentic teaching has benefits for both teachers and for student learning.¹²⁶ As put by Melissa J Marlow:

It is difficult to do our best as teachers if we are not coming from a place of integrity and transparency... [As] teachers, we have to be "real" and genuine in our dealing with students. They deserve to know us, and we deserve to experience passionate, related, and authentic teaching.¹²⁷

Indeed, we are doing ourselves (and in turn, our students) a disservice if, in pursuit of some false sense of neutrality, we ignore our own values and choose not to take steps to teach reproductive health inclusively.

¹²² Page (n 100) 116; McArthur (n 13) 494–6.

¹²³ See, eg, Carolin Kreber, 'Academics' Teacher Identities, Authenticity and Pedagogy' (2010) 35(2) *Studies in Higher Education* 171; Angus Brook, 'The Potentiality of Authenticity in Becoming a Teacher' (2009) 41(1) *Educational Philosophy and Theory* 46; Arthur W Chickering, Jon C Dalton, and Liesa Stamm, *Encouraging Authenticity and Spirituality in Higher Education* (Jossey-Bass, 2006); Patricia Cranton, *Becoming an Authentic Teacher in Higher Education* (Krieger, 2001); Christina Do and Aidan Ricciardo, 'Meaningful Connectedness: A Foundation for Effective Legal Teaching' (2019) *V Curtin Law and Taxation Review* 3, 27–8.

¹²⁴ Melissa J Marlow, 'Does Kingsfield Live? Teaching with Authenticity in Today's Law Schools' (2015) 65(1) *Journal of Legal Education* 229, 230–1; Patricia Cranton and Ellen Carusetta, 'Perspectives on Authenticity in Teaching' (2004) 55(1) *Adult Education Quarterly* 5, 7–8; Lauren Bialystok, 'Should Teachers be Authentic?' (2016) 10(3) *Ethics and Education* 313, 316–18.

¹²⁵ Marlow (n 124) 231; Cranton and Carusetta (n 124) 7.

¹²⁶ See, eg, Kreber (n 123). See also Carolin Kreber and Monika Klampfleitner, 'Lecturers' and Students' Conceptions of Authenticity in Teaching and Actual Teacher Actions and Attributes Students Perceive as Helpful' (2013) 66(4) *Higher Education* 463.

¹²⁷ Marlow (n 124) 241.

IV HURDLES TO TEACHING REPRODUCTIVE HEALTH INCLUSIVELY

This article has thus far argued that teachers in law and science *should* take steps to teach reproductive health in ways that are inclusive of trans and gender diverse people. But what challenges might teachers encounter in trying to take those steps? After setting out the hurdles that might be encountered in any discipline, this Part considers the particular hurdles that might arise in teaching about reproductive health in law and science.

A Hurdles in All Disciplines

There are a number of hurdles that a university teacher in any discipline might encounter when seeking to teach reproductive health in a trans-inclusive way. For example, there may be resistance to trans-inclusive pedagogy from a number of sources. Institutional resistance is a possibility,¹²⁸ especially in courses with interrelated knowledge where the content (and the way content is taught) is scaffolded across individual units. Resistance might also come from individual students and colleagues, especially from those who hold rigid binary views on sex and gender.¹²⁹ This resistance could manifest as anything from subtle discomfort to active pushback,¹³⁰ and may result in retaliation in formal student satisfaction surveys.

Adapting course content to be more trans-inclusive can also pose other challenges – for example, it might be difficult for teachers to find appropriate and resources that address reproductive health in an inclusive way. Textbooks and materials might not include trans-inclusive content, and might even undermine the teacher's trans-inclusive framing and terminology.¹³¹ Adapting course content might also be particularly difficult considering the time, workload and curriculum constraints already faced by many academics.¹³² There is also unlikely to be any workload recognition or reward for making these changes.

Another hurdle for many teachers will be their own lack of confidence and knowledge in delivering trans-inclusive reproductive health content.¹³³ Many educators may have limited personal understanding or formal training in gender diversity and inclusive teaching practices, leaving them uncertain about how to effectively teach in a trans-inclusive way. Without adequate training, teachers might struggle with the correct terminology or understanding of the specific health needs of trans and gender diverse people. This knowledge gap can create hesitation in addressing these topics and perspectives.¹³⁴

¹²⁸ Catherine Bovill et al, 'Addressing Potential Challenges In Co-Creating Learning And Teaching: Overcoming Resistance, Navigating Institutional Norms And Ensuring Inclusivity In Student-Staff Partnerships' (2016) 71 *Higher Education* 195, 199–203.

¹²⁹ *Ibid* 199– 201.

¹³⁰ See, by analogy, Jill M Hermann-Wilmarth and Caitlin Law Ryan, 'Navigating Parental Resistance: Learning from Responses of LGBTQ-Inclusive Elementary School Teachers' (2019) 58(1) *Theory Into Practice* 89, 91–2.

¹³¹ See Hayes and Temple-Smith (n 24); Beni, Fisher and Longhurst (n 31); Avelo, Neffling and Karala (n 15).

¹³² J Watts and N Robertson, 'Burnout in University Teaching Staff: A Systematic Literature Review' (2011) 53(1) *Educational Research* 33, 34.

¹³³ Gerber and O'Hara (n 37) 416.

¹³⁴ *Ibid*.

Relatedly, a fear of making mistakes — such as using incorrect language or unintentionally offending students — can deter educators from fully engaging with trans-inclusive content.¹³⁵ This fear may be exacerbated by concerns about being publicly criticised or facing backlash from students or colleagues,¹³⁶ which can discourage teachers from taking proactive steps to practice trans-inclusive pedagogy.

A final challenge present in education generally is that the responsibility to drive change in this space often falls on LGBTQ+ academics or students,¹³⁷ placing an undue burden on those directly affected by exclusionary pedagogy.¹³⁸ There is a pressing need for cisgender and heterosexual educators to actively participate as allies in fostering inclusive education.

Overcoming these challenges requires institutional support, access to professional development opportunities, and fostering a learning environment where educators feel safe to expand their understanding and adjust their teaching practices.¹³⁹

B Particular Hurdles in Law

In legal education specifically, a particular hurdle to teaching in a trans-inclusive manner is that the law itself — especially statute law — is often written in rigid cisnormative terms. For example, reproductive rights legislation often explicitly refers to 'women' without acknowledging that trans men and non-binary people can also experience pregnancy and associated reproductive health issues.¹⁴⁰ Properly teaching students the law itself while highlighting its inherent limitations requires a careful balance that can be challenging.

Beyond the law itself, legal education as a discipline often prioritises doctrinal analysis, which can constrain discussions around the social and human rights dimensions of trans-inclusive reproductive health. Law teachers may feel pressure to focus on black-letter law and may feel that it is difficult to justify the inclusion of broader socio-legal perspectives that critically examine how the law impacts transgender people. However, as noted by Gerber and O'Hara, inclusive law teaching 'involves resisting the notion that the law school

¹³⁵ Ibid; Carolina Snaider and Trystan Reese, 'You Don't Want to Say Anything Wrong: Teachers Fearing Uncertainties and Trans Parents (In)Visibility in Early Childhood Education' (2025) *Gender and Education* 11 (online ahead of print).

¹³⁶ See generally Elizabeth Payne and Melissa Smith, 'The Big Freak Out: Educator Fear in Response to the Presence of Transgender Elementary School Students' (2014) 61(3) *Journal of Homosexuality* 399, 412–15.

¹³⁷ Raquel Wright-Mair, 'The Costs of Staying: Experiences of Racially Minoritized LGBTQ+ Faculty in Higher Education' (2023) 48(20) *Innovative Higher Education* 329, 336–9; Finn et al (n 1) 32.

¹³⁸ Finn et al (n 1) 32. This is consistent with the experiences of other marginalised groups, and those at the intersections of multiple marginalised identities — see Wright-Mair (n 137) 336–9.

¹³⁹ See, eg, Marco Reggiani, Jessica Dawn Gagnon and Rebecca Jane Lunn, 'LGBT + Academics' and PhD Students' Experiences of Visibility in STEM: More than Raising the Rainbow Flag' (2024) 87 *Higher Education* 69, 84.

¹⁴⁰ Indeed, in relation to abortion this was the case in Western Australia until 2024 — see *Health Act 1913* (WA) s 334 as it existed prior to 27 March 2024. The new Western Australian legislative provisions relating to abortion instead use the term 'a person' — see, eg, *Public Health Act 2016* (WA) s 202MC. It may be noted that public consultation materials relating to this abortion law reform stated that pregnancy may be experienced by a person of any gender, but then referred to 'a woman' rather than 'a person' throughout — a matter that the first author of this article raised in their consultation submission — see Aidan Ricciardo, *Submission to the Abortion Legislation Reform Inquiry* (Public Health Regulation Directorate, 17 December 2022) 3–4.

curriculum is “neutral” and teaching students to unpack the ideologies and assumptions behind the material.’¹⁴¹

C Particular Hurdles in Science

Teaching reproductive health in a trans-inclusive manner within science disciplines presents distinct challenges rooted in both the structure of scientific knowledge and the culture of scientific education. Related to the point discussed in Part II(A), a key hurdle is the deeply ingrained use of gendered language when describing biological systems. This can be further complicated by not clearly explaining the distinction between different meanings of terms in differing societal and scientific contexts.¹⁴²

Reproductive biology often relies on binary frameworks – categorising bodies strictly as male or female – which can make it difficult to discuss complex terms, reproductive anatomy and processes without reinforcing cisnormativity. Using terms like ‘those who ovulate’ or ‘sperm-producing individuals’ are viable alternatives, but shifting to more inclusive language can be difficult when this is considered novel,¹⁴³ highlighting the little uptake in the discipline more broadly. Indeed, much of the foundational scientific literature and existing educational resources remain heavily gendered.¹⁴⁴

Additionally, scientific research relating to transgender, non-binary, and queer health issues is still limited.¹⁴⁵ The relative scarcity of empirical studies addressing the unique reproductive health needs of trans and gender diverse people creates a gap in evidence-based content for educators to draw upon. This lack of research not only limits what can feasibly be taught but also perpetuates the invisibility of trans and gender diverse people in scientific discourse.

Institutional priorities and funding patterns further exacerbate these challenges. Research funding and curriculum development in reproductive health often focus on heteronormative and cisnormative experiences. Without dedicated funding and institutional support, efforts to diversify teaching materials, expand knowledge and fields of research, and develop specialised medical treatment may remain isolated and underdeveloped.¹⁴⁶ Indeed, institutional priorities tend to be concerned with increasing representation without meaningful inclusionary changes.¹⁴⁷ Collectively, these issues compound and further deprive a consensus on issues relating to natural variation and trans and gender diverse (including non-binary) bodies in scientific educational frameworks.

¹⁴¹ Gerber and O’Hara (n 37) 452

¹⁴² Fimognari et al (n 4) 699.

¹⁴³ Ibid.

¹⁴⁴ Lisa Campo-Engelstein and Nadia Johnson, ‘Revisiting “The Fertilization Fairytale”: An Analysis of Gendered Language used to Describe Fertilization in Science Textbooks from Middle School to Medical School’ (2014) 9 *Cultural Studies of Science Education* 201; Hayes and Temple-Smith (n 24) 943–4; Beni, Fisher and Longhurst (n 31) 985–6; Aivelo, Neffling and Karala (n 15).

¹⁴⁵ See, eg, Safer (n 5).

¹⁴⁶ Ibid.

¹⁴⁷ Emily Yarrow and Karen Johnston, ‘Athena SWAN: “Institutional Peacocking” in the Neoliberal University’ (2023) 30(3) *Gender, Work & Organization* 757, 757–8.

V TEACHING REPRODUCTIVE HEALTH INCLUSIVELY: OUR EXPERIENCES

In this final Part, we provide examples setting out some ways in which reproductive health might be taught more inclusively in both law and science. We draw substantially from our own practice, teaching experiences, and reflections. Of course, these subjective experiences and perspectives may not always align with objective realities. However, the discussion in this Part is presented in the context of the relevant literature, and research has established that ‘properly contextualised reflective practice can produce knowledge of the mechanisms at work in the contemporary academy.’¹⁴⁸

This Part can be understood as an example of what Freire calls *praxis* – the dynamic integration of reflection and action in the pursuit of transformation.¹⁴⁹ By critically engaging with our own teaching experiences and using them to inform efforts toward more inclusive reproductive health education, we aim not only to analyse existing practices but to actively challenge and reshape them.

First, the first author – a law academic – sets out how reproductive health can be taught in a more trans-inclusive way in a health and medical law unit. Second, the second author – a science academic – sets this out with respect to human biology education. We then come together to provide some combined interdisciplinary reflections on inclusive reproductive health teaching across law and science.

Our teaching practice, experiences and reflections are shaped by our positionalities as cisgender gay men – while we are part of the LGBTIQIA+ community generally, we are not part of the trans or gender diverse community specifically. In this regard, we identify as ‘internal allies’ – as put by Ricciardo and Elphick:

Although we typically think of ‘allies’ of LGBTQIA+ people as those from outside the community who are supportive of us, those of us within the LGBTQIA+ community can, and should, also think of ourselves as allies. In thinking of ourselves as allies, we are reminded that we must comply with the principles and guidance relating to effective and appropriate allyship – eg, obligations to self-educate, engage in appropriate consultation and co-design, and platform marginalised voices... conceptualisation of oneself as an ally is especially important when an LGBTQIA+ [academic’s] work concerns specific LGBTQIA+ identities to which they do not belong.¹⁵⁰

Although this passage relates to ‘internal allyship’ (ie, those within the LGBTIQIA+ community acting as allies to one another) in the context of LGBTIQIA+ researchers who research about LGBTIQIA+ issues, it can apply equally to LGBTIQIA+ educators who, like us, teach content

¹⁴⁸ Sue Clegg, ‘Knowing Through Reflective Practice in Higher Education’ (2000) 8(3) *Educational Action Research* 451, 451, 466. See also Aidan Ricciardo, Julie Falck and Joe Louis Robinson, ‘Academic Experiences of Gradeless Learning’ (2022) 1 *Western Australian Law Teachers' Review* 27, 28.

¹⁴⁹ Freire (n 99) 128.

¹⁵⁰ Aidan Ricciardo and Liam Elphick, ‘Under My Umbrella: LGBTQIA+ Rights, LGBTQIA+ Researchers and ‘Internal Allyship’ (2024) 49(2) *Alternative Law Journal* 126, 126–7.

that relates to LGBTIQ+ people. Accordingly, our teaching (and our scholarship of teaching and learning) is underpinned by a commitment to educating ourselves about trans and gender diverse matters so that we can represent them adequately to our students;¹⁵¹ seeking feedback from our students and trans and gender diverse people generally to ensure that our work is designed and delivered appropriately;¹⁵² and platforming trans and gender diverse voices in our teaching and pedagogical scholarship (eg, through selecting course materials and citing works by trans and gender diverse people with relevant lived experience).¹⁵³

A Trans-inclusive Reproductive Health Teaching in Health & Medical Law

I (the first author) teach an undergraduate law unit at The University of Western Australia called 'Birth, Life and Death: Health and Medical Law'. The first parts of the unit ('birth' and 'life') are most relevant to reproductive health, covering topics relating to pregnancy, the legal status of the unborn, abortion, assisted reproductive technologies, as well as gender affirmation. In my teaching of all aspects of the unit I endeavour to conscientise students as to how law is often framed as an objective set of rules, whereas in reality it reflects the social, political, and historical contexts in which it is made. I encourage students to consider how the relevant legal frameworks are shaped by prevailing norms about bodies, gender, ability, and morality, meaning they are not neutral but deeply value-laden.

When I first took on coordination of the unit in 2020, I taught the topics in the same way and with the same terminology that had been used in previous years. For example, when speaking of pregnancy, I almost invariably used the term 'pregnant woman' without acknowledging that people who do not identify as women can also be pregnant.¹⁵⁴

Reflecting on my teaching throughout that semester in 2020, I realised that although I personally valued the inclusion of trans and gender diverse people and understood some of the ways in which the topics applied to trans and gender diverse people, this was not adequately reflected in my teaching. I felt as though I was oversimplifying the concepts I was teaching, and used terms of convenience (eg, 'pregnant woman') to avoid grappling with the complexity of gender diversity in the classroom. I felt that my teaching was not adequately preparing my students for the diversity they might actually encounter 'in the real world'. I also worried that any trans and gender diverse students in my class might perceive my teaching as deliberately non-inclusive and feel unsafe in my class.¹⁵⁵

In 2021, I made an effort to rethink the way that I spoke of sex and gender throughout the course. Importantly, I chose to move away from the term 'pregnant woman' and instead use the term 'pregnant person'. However, I worried that I might be dismissed by students as somewhat of a 'radical' – that they might interpret this use of language as me overtly trying

¹⁵¹ Ibid 131.

¹⁵² Ibid 131–2.

¹⁵³ Ibid 132.

¹⁵⁴ Contrary to best practice – see Sørli (n 43) 637–8, 641–2.

¹⁵⁵ See generally Ricciardo et al (n 41) 317–19, 330.

to 'indoctrinate' them with my personal views about gender.¹⁵⁶ To abate this risk, I chose to introduce the choice of terminology in the context of external sources which might be perceived as more neutral and objective than my own opinions.¹⁵⁷ The following text appeared on the first slide when moving to consider pregnancy in the course:

A NOTE ABOUT TERMINOLOGY

This unit aims to reflect developments in science, society, and in healthcare practice. Part of this is using the terminology used in those settings.

The Australian Government's Pregnancy Care Guidelines: *'The Guidelines recognise that individuals have diverse gender identities. Terms such as pregnant person, childbearing people and parent can be used to avoid gendering birth, and those who give birth, as feminine. [Whilst terms like woman and mother are often used], it is not meant to exclude those who give birth and do not identify as female.'*¹⁵⁸

Kinnon R MacKinnon et al, 'Recognizing and Renaming in Obstetrics' (2021) 14(4) *Obstetric Medicine* 201: *'... the term 'pregnant person' does not discredit cisgender women; rather it opens the umbrella to cover everyone seeking obstetrical care. Language evolves, and words matter. Providing comprehensive and accessible healthcare to all includes broadening gender-neutral and affirming language in obstetrics.'*¹⁵⁹

As can be seen from the text of the slide, I anchored the choice to government guidelines and research from the health sciences, expecting that these authorities might provide a solid grounding for the choice (quite apart from my own views). Doing so also has the added benefit of teaching students professional skills about the importance of keeping up with contemporary standards relating to diversity and inclusion in applied contexts.¹⁶⁰

As the topic went on, my subjective impression was that students generally accepted this choice of language (indeed, I noticed that they used that same terminology when participating in class). I also found that explicitly engaging with the reality that people who are not women might become pregnant had further benefits: it actually enabled further, more nuanced analysis of the law itself.¹⁶¹ For example, when walking through legislation relating to abortion, students questioned the cisnormative language used in legislation. They asked questions like 'If a person who isn't a woman is pregnant, can they still seek an abortion even though the law refers only to "a woman" who is pregnant?'. This provided a fantastic opportunity to ask students to critically consider whether the law is adequate when it does not reflect reality, and to think about how that might create practical problems for those

¹⁵⁶ See generally Lydia Fagan and Victoria Rawlings, 'Gender Fluidity And "Other Left-Wing Superstitions": Problem Representations In The Inquiry Report On The Nsw Parental Rights Bill' (2024) *Educational Review* 3–4 (online ahead of print); Human Rights Watch, *'I Became Scared, This Was Their Goal': Efforts to Ban Gender and Sexuality Education in Brazil* (Report, 2022); Payne and Smith (n 136) 412–15.

¹⁵⁷ A similar approach – anchoring choices to sources of perceived objectivity – is recommended by Gerber and O'Hara (n 37) 432.

¹⁵⁸ Australian Government, *Clinical Practice Guidelines: Pregnancy Care* (Guidelines, 2020). A slightly different passage appears in the updated 2025 version of these Guidelines – see Australian Living Evidence Collaboration, *Clinical Practice Guidelines: Pregnancy Care* (Guidelines, 2025) 9.

¹⁵⁹ Kinnon R MacKinnon et al, 'Recognizing and Renaming in Obstetrics: How do we Take Better Care with Language?' (2021) 14(4) *Obstetric Medicine* 201, 202.

¹⁶⁰ Cody (n 115) 2.

¹⁶¹ See generally Gerber and O'Hara (n 37) 452–5.

people seeking access to, and those people providing, reproductive healthcare (including abortions).¹⁶² In 2022, based on that experience, I explicitly embedded discussion of this issue into the class plan, noting that abortion legislation which uses the term 'woman' in place of 'pregnant person' fails to recognise the medical, social, and psychological realities that there is a diversity of sex and gender,¹⁶³ and that people who might legally be classed as any gender can become pregnant and might choose or require an abortion. This may occur for many reasons – for example, many trans people obtain social and/or legal recognition of their affirmed gender whilst retaining their reproductive characteristics.¹⁶⁴ People with non-binary gender identities may also become pregnant. Some intersex people who were assigned male at birth might also become pregnant (depending on the variations of sex characteristics they have).¹⁶⁵

Beyond the topics relating to pregnancy, I did my best to consider trans and gender diverse perspectives throughout the course. For example, when discussing the law relating to public health,¹⁶⁶ I chose to teach about barriers to access to healthcare for marginalised groups, including transgender and gender diverse people. I encouraged students to discuss the role the law has played in establishing those barriers, then asked them to consider any legal, policy or other regulatory solutions.

As another (perhaps obvious) example, a terminology issue also arose when covering the law relating to gender affirmation.¹⁶⁷ Although it is soon set to change,¹⁶⁸ the current legislation in Western Australia uses the term 'gender reassignment' – indeed, it is called the *Gender Reassignment Act 2000* (WA). That terminology is considered inaccurate and outdated by many trans people,¹⁶⁹ so I made sure to explicitly grapple with this in classes, noting that trans people – and healthcare practitioners – now typically use the term 'transition' or 'affirmation' rather than 'reassignment'.¹⁷⁰ In choosing sources for this topic (including academic and media sources), I made an effort to focus on transgender and gender diverse voices, enabling students to engage with authentic perspectives informed by lived

¹⁶² Abortion can be conceptualised as reproductive health – see, eg, Enze Xing et al, 'Abortion Rights are Health Care Rights' (2023) 8(11) *JCI Insight* Article No 171798.

¹⁶³ See generally, Štrkalj and Pather (n 32); Janet Hyde et al, 'The Future of Sex and Gender in Psychology: Five Challenges to the Gender Binary' (2019) 74(2) *American Psychologist* 171; Sarah Hunt, 'Embodying Self-Determination: Beyond the Gender Binary' in *Determinants of Indigenous Peoples' Health: Beyond the Social* (Canadian Scholars, 2nd ed, 2018); Matsuno and Budge (n 55); Ada S Chung et al, 'Non-Binary and Binary Gender Identity in Australian Trans and Gender Diverse Individuals' (2020) 49(1) *Archives of Sexual Behaviour* 2673.

¹⁶⁴ See, eg, *AB v Western Australia* [2011] HCA 42.

¹⁶⁵ It should also be noted that an intersex person – like any person – may have any gender identity.

¹⁶⁶ Public health can include reproductive health – see eg, Farzana Kapadia, 'Reproductive Justice Matters: A Public Health of Consequence' (2022) 112(8) *American Journal of Public Health* 1107.

¹⁶⁷ Though not itself technically reproductive health, gender affirming treatments intersect with reproductive health – see, eg, Kenny Rodriguez-Wallberg et al, 'Reproductive Health in Transgender and Gender Diverse Individuals: A Narrative Review to Guide Clinical Care and International Guidelines' (2022) 24(1) *International Journal of Transgender Health* 7.

¹⁶⁸ John Quigley, 'Government Delivers Important Reforms for LGBTQIA+ Community' (Media Release, September 2024) <<https://www.wa.gov.au/government/media-statements/Cook-Labor-Government/Government-delivers-important-reforms-for-LGBTQIA%2B-community--20240917>>.

¹⁶⁹ Aidan Ricciardo et al, 'Supporting LGBTQI+ Diversity and Inclusion in Legal Education: A "How To" Guide for Law Schools and Law Teachers' (2022) 1 *Western Australian Law Teachers' Review* 3, 6.

¹⁷⁰ Marin McCoy et al, 'Understanding Sex and Gender: Concepts and Terminology for Gender Affirming Care' (2024) 54 *Pediatric Radiology* 1345, 1349–50.

experience. This focus also helps to counter the pathologising perspectives that can be present in the law and other sources.¹⁷¹

In a broad sense, there is capacity to apply these approaches to other law courses beyond health and medical law. The guiding question I ask myself when planning my lessons is '*Quite apart from the words and approaches used by the law, does the way I am teaching each topic consider and include trans and gender diverse people and their experiences?*'. This requires me to think about the language I use and my choices about what content and sources to include in the course. If the law itself isn't inclusive of trans and gender diverse people, there is scope to invite students to engage in analysis in this regard. This is an approach which has been instructive in my own teaching of health and medical law, but which is likely to be helpful for those teaching in any area of law.¹⁷²

B Trans-inclusive Reproductive Health Teaching in Science

I (the second author) teach into a second-year undergraduate anatomy and human biology unit at The University of Western Australia called 'Human Reproductive Biology'. This unit encompasses study of the human reproductive system(s) from conception, gestation and throughout a person's life. The key focus is reproductive anatomy, cell biology and physiology, but the unit includes linkage with other major systems, developmental changes, and genetics. Often considered peripheral to the 'science' of reproductive biology; sexual health, development, behaviour and identity are important themes deeply entangled in this field that manifest and change throughout an individual's life.¹⁷³ As an educator in this space, I feel that reproductive biology is well positioned to bring awareness to some inequalities and contemporary issues that impact identity, sexual/reproductive health and biology. Accordingly, I consider that I have a duty to explore these nuances within the framework of the unit, especially at a time when many students – as new adults – are just beginning to explore these matters themselves in personal and interpersonal aspects of their lives.

When I started to teach into this unit in 2021, I observed amongst others in the teaching team a clear intention to enhance knowledge of gender diversity and queer issues in reproductive biology, and a desire to enable students to tackle some major incumbent and contemporary societal issues. This was the first time in my educational career – as a student, professional, and teacher in human biology – that I had experienced such a dedication to increasing queer visibility in tertiary education. It also expanded my knowledge of societal understandings of gender as a construct (including views which were not unanimously supported by the scientific community). Additionally, as a cisgender gay man, I felt that the team of academics in the unit upheld a shared vision with authentic intentions, and I admired that these efforts

¹⁷¹ Sheherezade Kara, *Gender is Not an Illness: How Pathologizing Trans People Violates International Human Rights Law* (GATE Publications, 2017) 5; Maria Elisa Castro-Peraza et al, 'Gender Identity: The Human Right of Depathologization' (2019) 16(6) *International Journal of Environmental Research and Public Health* Article No 978, 5–8; Husain (n 69); Suess Schwend (n 67).

¹⁷² Indeed, inclusive pedagogy scholarship specific to human rights education has been helpful in informing my own teaching in other areas of law – see generally Gerber and O'Hara (n 37).

¹⁷³ See generally Fimognari et al (n 4).

came from a largely cisgender, non-queer team. This demonstrated bona fide allyship, and was supported by the unit coordinators' genuineness and openness in asking for feedback, and subsequently giving me the opportunity to drive further changes in the unit. While there was a clear commitment to adopting de-gendered language and incorporating some inclusive content, I felt that more could be done to embed inclusive content relating to LGBTIQ+ people and their bodies throughout the unit's curriculum. Additionally, I believed the best opportunity for encouraging meaningful engagement with this content was by requiring students to address it in the unit's major assessment. Indeed, research indicates that students often focus their engagement on content that is directly assessed, highlighting the impact of assessment on learning priorities.¹⁷⁴

Since 2021, I have led some significant changes to the unit's content through altering the scope and framework of a major group assignment to increase visibility of queer, gender diverse and other diverse groups in reproductive biology. This infographic-based group assignment previously related to blocking or preventing fertility as a novel contraceptive and potential future medical application – in other words, it required students to focus on *creating* a reproductive barrier. Instead, we shifted the lens to require students to consider how assisted reproductive technologies could be used to improve fertility status and reproductive outcomes. The new assignment requires students to focus on overcoming the anatomical and biological limitations they learn throughout the unit – so it requires students to instead focus on *surpassing* a reproductive barrier. This new assignment aimed to deepen understanding of gender diversity, increase visibility of various forms of diversity, enhance inclusive content, and allow students to connect scientific publications in the field to potential solutions for reproductive issues faced by marginalised groups.¹⁷⁵

In preparing to make these changes, I – and the broader teaching team – considered the potential effect of these reforms with reference to the existing pedagogical scholarship in this area.¹⁷⁶ We wondered '*Would these changes actually have the intended impact on the student cohort?*'. We also knew from our own expertise and consultation that gender diverse representation was so lacking in this field that any changes would be impactful –¹⁷⁷ '*is this enough without any formal impact assessment?*'. Additionally, changing the scope of the assignment to capture more diverse reproductive challenges required removal of key content around contraception – '*Are these changes at the detriment of other issues and populations (eg, cisgender women and societal inadequacies around contraception)?*'.¹⁷⁸

¹⁷⁴ Annemette Kjærgaard, Elisabeth N Mikkelsen and Julie Buhl-Wiggers, 'The Gradeless Paradox: Emancipatory Promises but Ambivalent Effects of Gradeless Learning in Business and Management Education' [2022] *Management Learning* 1, 2; Aidan Ricciardo and Julie Falck, 'Letting them Learn How to be Law Students: Student Perceptions of "Ungraded Pass/Fail" Assessment in the Foundational Subject of a Qualifying Law Degree' (2022) 15 *Journal of the Australasian Law Academics Association* 77, 84.

¹⁷⁵ Fimognari et al (n 4) 700–3.

¹⁷⁶ See, eg, Hayes and Temple-Smith (n 24); Beni, Fisher and Longhurst (n 31).

¹⁷⁷ Fimognari et al (n 4) 700.

¹⁷⁸ See, eg, John Cleland, Sarah Harbison, and Iqbal H Shah, 'Unmet Need for Contraception: Issues and Challenges' (2014) 45(2) *Studies in Family Planning* 105. See also Amanda Francis, Sona Jasani and Gloria Bachmann, 'Contraceptive Challenges and the Transgender Individual' (2018) 4 *Women's Midlife Health* Article No 12.

To ensure that our approach to teaching reproductive health in an inclusive way was impactful and effective, we were guided by a principled approach as part of a holistic framework whereby we tried to:

1. Increase visibility and understanding of issues affecting queer, trans and other marginalised groups in reproductive biology, especially through a major assignment, and integration of new inclusive content;
2. Ensuring balance by promoting these inclusive efforts whilst maintaining scientific rigour and key educational outcomes;
3. Enhance coverage of under-represented issues whilst ensuring other important issues receive warranted attention (eg, by running a laboratory which focussed specifically on contraception);
4. Highlight challenges in society and reproductive biology that entrench cisnormative and heteronormative understandings and views; and
5. Measure the social impact of changes through empirical and collaborative means, including dedicated student evaluation surveys before and after semester, mapping the discussion of diversity-related content in student assignments, and engaging with students for feedback which could be used to further develop the unit.

The cumulative changes made to enhance inclusionary content in reproductive biology by our team of academics, and an impact assessment for the changes to the major assignment have been detailed in a recent publication.¹⁷⁹ In brief, student feedback and indicators of social impact were overwhelmingly positive –¹⁸⁰ eg, student survey respondents were ‘unanimous in their agreement that the unit was inclusive of LGBTIQ+ issues and that the unit made them think about societal issues related to reproductive health differently’.¹⁸¹ However, some student feedback requested more information around genital diversity, including non-binary forms and genitals with mutilation. Reflecting on our approach, and taking account of the impact and feedback we received around wanting more teaching on genital diversity, I am reminded of the need to enhance coverage of under-represented issues in our teaching generally (as set out in our holistic framework). There is a need to increase the visibility of many diversity and inclusion issues in this space, including in relation to other marginalised groups (which may or may not intersect with LGBTIQ+ communities). Having used my teaching to increase visibility of issues within queer communities, I am also committed to using this platform to bring greater awareness and competence in relation to the nuances experienced by other minority and marginalised groups in reproductive biology. I also feel that we have a duty – consistent with critical pedagogy – to treat our students as

¹⁷⁹ Fimognari et al (n 4).

¹⁸⁰ This data collection has approval from the University of Western Australia Human Research Ethics Office – reference 2022/ET000415.

¹⁸¹ Fimognari et al (n 4) 702.

stakeholders and co-creators of course content,¹⁸² and that we must listen to and act on their feedback where possible and appropriate.

This being said, as a science academic I can acknowledge that in some cases, significantly restructuring a unit to incorporate trans-inclusive content may not be feasible, practical, or pedagogically appropriate. For example, in certain science disciplines like chemistry, the subject matter and learning objectives may not directly intersect with concepts of gender, identity, or human experience. Of course, is only appropriate to cover academic content relating to trans and gender diverse people where it is relevant to the course. However, this should never serve as a justification for avoiding inclusive practices or neglecting the needs of gender diverse students – trans-inclusive practice in the science classroom can extend beyond content and curriculum.¹⁸³

C Interdisciplinary Reflections on Inclusive Reproductive Health Teaching Across Law and Science

Our experiences teaching reproductive health inclusively in law and science settings reveal both important parallels and meaningful points of divergence between the two disciplines. In reflecting on our practice, it is apparent that while the disciplinary traditions and expectations of law and science differ in many respects, there are significant commonalities in the challenges faced, the strategies employed, and the benefits observed when reproductive health is taught in a way that is inclusive of trans and gender diverse people. These reflections suggest that there are lessons to be learned across disciplines, as well as from within them.

Both our experiences suggest that, in law and science alike, teaching reproductive health inclusively is not simply a matter of adding isolated content relating to trans and gender diverse people. Instead, it requires a more fundamental engagement with the assumptions and frameworks that underpin the discipline itself. In law, these assumptions often relate to the ways in which legal sources and legal analysis are framed as objective and neutral, despite being shaped by social and political contexts that have historically marginalised trans and gender diverse people. In science, they relate to the ways in which binary models of sex and gender have been treated as natural and biologically determined, despite significant scientific evidence to the contrary. In both cases, teaching inclusively requires a willingness to critically interrogate the foundational assumptions of the discipline, and to be transparent with students about the ways in which disciplinary knowledge has been, and continues to be, socially situated.

Our reflections also suggest that similar pedagogical strategies can be effective across disciplines, even where the subject matter and epistemological traditions differ. In both law and science, we found that framing inclusive teaching practices as aligned with disciplinary

¹⁸² Bovill et al (n 128); Alison Cook-Sather and Kelly E Matthews, 'Pedagogical Partnership: Engaging with Students as Co-creators of Curriculum, Assessment and Knowledge' in Lynne Hunt and Denise Chalmers (eds), *University Teaching in Focus* (Routledge, 2nd ed, 2021) ch 11.

¹⁸³ Fimognari et al (n 4) 698–9.

values — such as legal coherence or scientific accuracy — helped to situate these practices as an extension of, rather than a departure from, disciplinary norms. For example, in health law, drawing attention to the way legislation may fail to capture the realities of all people capable of pregnancy not only made trans and gender diverse people visible, but also encouraged students to think critically about the adequacy of the law. In reproductive biology, refocussing on assistive reproductive technology rather than contraception not only challenged cisnormative assumptions but also better reflected the complexity and diversity of human biology. In both cases, inclusive teaching practices were framed not as ideological interventions, but as necessary to achieve the core goals of the discipline.

Despite these commonalities, our experiences also highlight some differences that arise from the distinct nature of law and science as fields of study. In law, language itself is central: it is the primary medium through which legal meaning is constructed and communicated.¹⁸⁴ As a result, changes in language — such as using ‘pregnant person’ rather than ‘pregnant woman’ — can feel particularly significant, and can prompt critical reflection on how the law constructs and regulates bodies and identities. In science, by contrast, language is often perceived as secondary to empirical observation and description.¹⁸⁵ Consequently, challenges to traditional language in science education may be less immediately visible, but are no less important, given the ways in which language shapes what is observed, described, and understood.

Our reflections also highlight the importance of considering student experience and engagement across both disciplines. In both health law and reproductive biology, we observed that students were generally receptive to inclusive teaching practices, especially when these practices were introduced thoughtfully and situated within the broader aims of the course. Students demonstrated a willingness — and, in many cases, an enthusiasm — to grapple with the complexities that arise when traditional assumptions are questioned. This demonstrates the ongoing need for careful framing, scaffolded engagement, and explicit discussion of why inclusive teaching is not a departure from disciplinary rigour, but an enhancement of it.

Finally, our interdisciplinary reflections reinforce the importance of ongoing self-education and consultation in developing and delivering inclusive pedagogy. As cisgender academics working as allies,¹⁸⁶ we recognise that our perspectives are necessarily limited. In both law and science, we have found it essential to seek feedback and guidance from students, to consult external sources (including scholarship and voices from trans and gender diverse communities), and to approach our teaching as a continual process of learning, reflection, and adaptation.¹⁸⁷ Inclusive teaching in any discipline is not a static achievement but a dynamic and iterative practice.

¹⁸⁴ Timothy Endicott, 'Law and Language' in Edward N Zalta et al (eds), *The Stanford Encyclopedia of Philosophy* (Stanford University, Spring 2022) <<https://plato.stanford.edu/archives/spr2022/entries/law-language/>>.

¹⁸⁵ Matthew Normand, 'The Language of Science' (2017) 42(3) *Perspectives on Behaviour Science* 675, 676–8.

¹⁸⁶ Ricciardo and Elphick (n 150) 126–7.

¹⁸⁷ This is consistent with the role of teachers in critical pedagogy. As put by Freire (n 99) 80, '[t]he teacher is no longer merely the-one-who-teaches, but one who is himself taught in dialogue with the students, who in turn while being taught also teach.'

Taken together, these interdisciplinary reflections suggest that while disciplinary differences matter, the broader imperatives for inclusive reproductive health education transcend individual fields. Teaching inclusively enhances the accuracy, relevance, and integrity of our disciplines, and better prepares our students to engage with the diversity of the communities they exist in.

VI CONCLUSIONS AND RECOMMENDATIONS

Reproductive health education in tertiary settings must move beyond its historically cisnormative frameworks. As this article has demonstrated, both science and law have traditionally relied on binary and cisnormative assumptions about sex and gender, perpetuating exclusions that distort biological and social realities. We have duties to our students, our communities and ourselves to teach reproductive health in a way that includes and accurately depicts trans and gender diverse people. A trans-inclusive approach is not just a progressive ideal – it is about ensuring that future professionals in science and law are equipped to work competently and ethically with diverse populations. Trans and gender diverse people exist within every field, every patient population, and in every jurisdiction. Their realities cannot be ignored or treated as peripheral. A reproductive health curriculum that fails to account for this is not only incomplete but actively harmful.

A fundamental step in this shift is uncoupling sex assigned at birth from gender, sexuality, and identity. While biological differences exist between people, they do not map neatly onto rigid categories of 'male' and 'female,' nor do they determine identity or lived experience.¹⁸⁸ This reality must be reflected in course content, dismantling outdated narratives that falsely equate anatomy with identity.

Educators must critically consider how they can develop assessments, syllabi, and learning materials to ensure that inclusion is not an afterthought but an integral part of the curriculum.¹⁸⁹ Our courses should challenge binary assumptions rather than reinforce them, and students should be encouraged to engage with the complexity of reproductive health beyond traditional frameworks. Authentically engaging students as stakeholders in these developments (eg, by being responsive to their feedback and seeking their input throughout) ensures that inclusion is not imposed top-down but developed in conversation with those it seeks to benefit.

Institutional support is also necessary. Universities must actively support educators in this shift, providing resources, training, and recognition for those working on inclusive pedagogy. Consulting representatives from marginalised groups is crucial to ensure that content is not just inclusive but also accurate and affirming.

¹⁸⁸ See generally McCoy et al (n 170).

¹⁸⁹ For specific recommendations and strategies in this regard see Finn et al (n 1).

At the same time, educators must be prepared to challenge resistance – whether from students, colleagues, or institutional structures. Avoiding difficult conversations only entrenches the status quo. Inclusive education demands active engagement with pushback, addressing misunderstandings with evidence and fostering an environment where critical inquiry is encouraged rather than dismissed.

Reforming the way we teach reproductive health is a collective responsibility, and the path forward is clear. By embedding inclusion within our teaching, we foster learning that encompasses the diversity of human experience.