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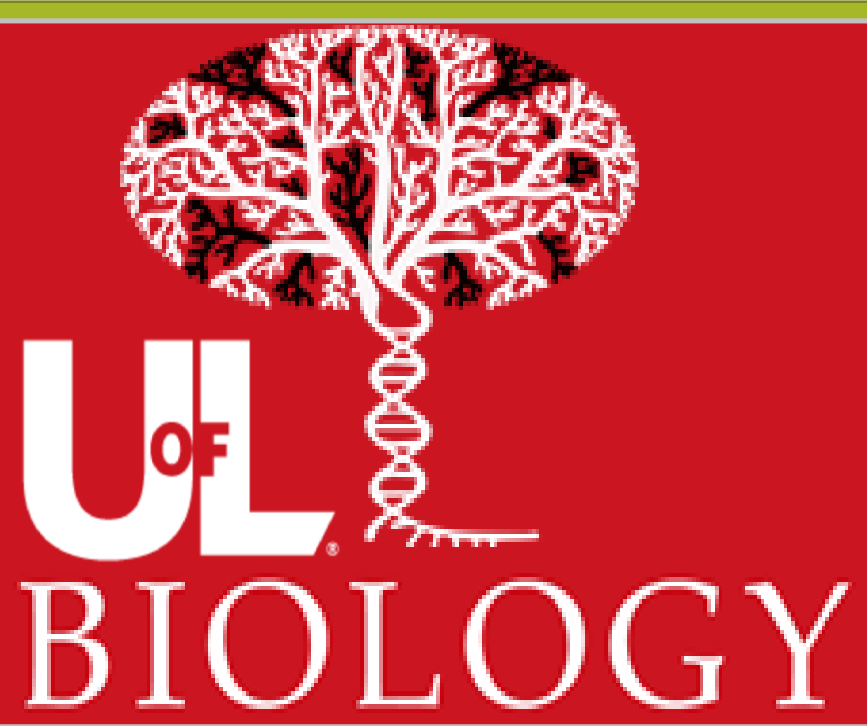
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SEEN IN SCIENCE: LGBTQ+ Inclusivity in Anatomy & Physiology Texts

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Background

- Prior research by Kat Ray King found that University of Louisville pre-healthcare undergraduates have a binary view of sex/gender that is not representative of the scientific consensus.
- Gender essentialism in the classroom excludes LGBTQ+ students.
- 1/3 of Gen Z identifies as “non-heterosexual”¹ (almost 800 million people worldwide).

(Queer) Theory Framework

- Challenges conventional representations of females, males, and members of the LGBTQ+ community in science materials^{2,3}.
- Moves beyond a sex/gender binary⁴ and deconstructs the traditional identity categories⁵ in the natural sciences.

Methods

- Four textbooks from universities with top nursing programs were identified.
- Researchers independently read each textbook and scored the books in all four categories⁶.
- In any instances of conflict, scores were reconciled by researchers based on specific examples drawn from text.
- Researchers also highlighted portions of text that aligned with the codebook generated from prior research; these areas support the scoring rubric.

Research Question
Are college-level Anatomy & Physiology textbooks inclusive of LGBTQ+ identities?

Results
College-level Anatomy & Physiology textbooks are **NOT INCLUSIVE** of LGBTQ+ people

Scoring Rubric

Categories	Scoring Scale		
	1	2	3
Structure	Female gametes and/or reproductive system almost always passive; male gametes or reproductive system placement always comes before female	Female gametes and/or reproductive system roughly equally passive and active; male gametes or reproductive placement usually comes before female	Female gametes and/or reproductive system almost always active; male gametes or reproductive system placement alternates equally with female
Amount of Info	Explanations almost always unequal; facts almost always unbalanced	Explanations somewhat unequal; facts somewhat unbalanced	Explanations always equal; facts always balanced
Neutrality	Frequent use of unnecessary commentary or comparison; frequent use of unbalanced adjectives	Infrequent use of unnecessary commentary or comparison; infrequent use of unbalanced adjectives	No unnecessary commentary or comparison; no unbalanced adjectives
LGBTQ+ Inclusion	LGBTQ+ people are not mentioned in any way	LGBTQ+ people are mentioned but only in disease contexts	LGBTQ+ people are mentioned/included as normative human sexuality/gender expressions

Consensus Textbook Scores

Textbook	Year	Structure	Amount of Info	Neutrality	LGBTQ+ Inclusion	Average
Anatomy & Physiology: Unity of Form & Function	2018	1	1	1	2	1.25
Human Anatomy & Physiology	2018	1	2	1	1	1.25
Principles of Anatomy & Physiology	2017	2	2	2	1	1.75
Seeley's Anatomy & Physiology	2017	2	3	2	1	2

Codebook

Themes	Topics
Heteronormativity	Purpose of sex (act) Functions of penis and vagina Homosexual encounters mentioned or not
(Non)-Binary Sex	Two (essentially different) sexes Intersex inclusion/exclusion
Male Norm	Equal representations of organs and functions Contrast of females against males (or vice versa) Presentation of homologues
Gender Norms	Reproduction/development = female role Female depicted meek or passive; males as strong or active Development linked only to females

Principles of Anatomy & Physiology

Male unit before female but roughly equal passive/active between units; male topics receive somewhat more attention: e.g. “The testes are **paired oval glands measuring about 2 in. long and 1 in. in diameter, a mass of 10–15 grams each**” (p. 1057) versus “The ovaries are **paired glands that resemble unshelled almonds in size and shape...**” (p. 1070); unbalanced adjectives: e.g. “Ejaculation, the **powerful release of semen...**” (p. 1067); neutral topics rather than male/female: e.g. “**Human Sexual Response**” unit rather than male/female sexual response; no mention of LGBTQ+ in any context.

Human Anatomy & Physiology

Male unit before female, male topics receive somewhat more attention: e.g. “Each **testis is approximately 1.6 inches long by 1 inch wide...**” (p. 1062) versus “**Shaped like an almond and about twice as large, each ovary...**” (p. 1075); comparisons consistently rely on male forms to define female: e.g. “**Homologous to the bulbourethral glands of males... Homologues of the single penile bulb and corpus spongiosum of the male**” (p. 1067); unnecessary commentary: e.g. “**Sperm "pack" lightly-they only carry what they absolutely need**” (p. 1072); no mention of LGBTQ+ in any context.

Anatomy & Physiology: Unity of Form & Function

Male unit before female, male topics receive more attention: e.g. “The neurological and vascular controls of the female response are **essentially the same as in the male and need not be repeated here**” (p. 1076); factually incorrect information presented about females: e.g. “**There is no evidence of an internal urethral sphincter in females**” (p. 913); unbalanced adjectives: e.g. “The activated sperm now **thrash with their tails and crawl up the mucosa** of the vagina and uterus (p. 1046), homosexuality only referenced in context of a disease risk: e.g. “...most cases [of HIV infections] occur in **men who have sex with other men...**” (p. 838).

Seeley's Anatomy & Physiology

Male unit before female; roughly equal passive/active between units; facts/descriptions balanced between units; unnecessary commentary: e.g. “**Gender is a common way that we classify people. Just think of all the times you have had to check a box for male or female**” (p. 1029); unbalanced adjectives: e.g. “The forces responsible...include the swimming ability of the sperm cells and **possibly the muscular contractions of the uterus and the uterine tubes.**” (p. 1064); no mention of LGBTQ+ in any context.

References: (1) Page (2018). “Generation Z – Beyond Binary: new insights into the next generation.” (2) Ah-King (2013). Queering animal sexual behavior in biology textbooks. (3) Bazzul & Sykes (2011). The Secret Identity of a Biology Textbook: Straight and Naturally Sexed. (4) Knaier (2019). What makes girls and boys so desirable? : STEM education - Beyond gender binaries. (5) Letts & Fifield (2019). Queering science education without making too much sense. (6) Campo-Engelstein. (2013) Revisiting “The fertilization fairytale”.