A Systematic Approach to Unveiling the Hidden Curriculum in Medical Education: Using Computer Science to Detect and Reduce Bias

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Background

Identifying and reducing bias in medical curricula is critical in the education of future physicians. Physicians continue to be biased.[1–3] The impact of these numerous blind-spots within education may impact the care that students provide as well as their learning environment and wellbeing alike.[4]

Purpose

To develop a systematic, computer-based, Bias Reduction in Curricula Content (BRICC) process and software to identify and decrease bias in medical curricula content.

Methods

We will develop a computer-based program that will identify bias in medical curricula using information extraction and natural language processing.

The results will then undergo an analysis by trained evaluators to assess whether bias is being detected by BRICC software.

As a precursor to the development of the software, documents are collected from the University of Washington School of Medicine curriculum to undergo BRICC review using the qualitative coding software, Atlas.ti.

Each sentence of these documents is analyzed for 4 parent code categories: *inappropriate use of language*, *potential bias*, *non-bias* and *bias.*

Parent Code Definitions	Examples
Inappropriate use of language: Use of language that is either outdated or misused	"A 38-year-old male with a history of depression and anxiety complains of weight loss, agitation, and poor sleep." *Child Codes: Sex-Misuse, Male*
Potential Bias: Flagging a statement that may need further review to determine bias or non-bias status	"You are working at a medical clinic in a remote community in Nepal." *Child Codes: Geography-Disease, Nepal*
Non-Bias: using social identifiers in a way that is neither "Inappropriate use of language" or "Potential Bias".	"You are called to the pediatric emergency room to consult on an infant, who was delivered a week ago at another hospital." *Child Codes: Infant*
Bias: The use of stereotypes, theories of inherent group difference and advocacy of differential medical treatment based on social identities	"Overall African Americans may have lower levels of disordered eating behaviors than European Americans, and greater body satisfaction than European, Asian and Hispanic Americans." *Child Codes: Ethnicity-Disease, European, Asian, Hispanic American, European American, African American*

Discussion

Our BRICC software program allows for a systematic way to identify bias in medical curricula across many institutions. One limitation is that language and social identifiers are changing; BRICC will therefore require ongoing updates. Content creators will also need to be open to revising and altering their content.

Conclusions and Implications

The BRICC computer software, once finalized, can be adopted by institutions looking to de-bias their curriculum and improve medical education. The computer program will also be web-based to promote a user-friendly interface.

Outcomes

Software that analyzes bias in medical curricula content to reduce implicit bias, establish equitable inclusive education, and improve outcomes for patients and future physicians. Preliminary data show that our BRICC process has identified numerous instances of ongoing bias in curricula content, including racism, gender bias, and the absence of pertinent social and structural determinants of health.

Acknowledgements

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