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An Analysis of Student Generated Learning Objectives for the Integration of Diversity, Equity, and Inclusion Competencies

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Abstract

At a regional medical school in the Northeastern U.S., first year medical students form discussion-based groups that focus on experiential case learning. In these small groups, students are responsible for writing their weekly learning objectives (LOs) in each of the medical school's four pillars: Basic Science, Clinical Sciences, Health Systems Sciences, and Health Humanities. The Health Humanities (HH) pillar provides medical students with the opportunity to study the principles of diversity, equity, and inclusion (DEI) within the context of medicine. Using the Association of American Medical Colleges' (AAMC) *New and Emerging Areas in Medicine Series: Diversity, Equity, and Inclusion Competencies Across the Learning Continuum* guide and Bloom's taxonomy, we provide an initial descriptive report of the extent to which HH LOs created by students in this self-directed curriculum address the DEI competencies the AAMC expects medical students to develop by the time of graduation.

Keywords: Medical Education; Regional Medical Campus; Diversity, Equity, and Inclusion.

Introduction

The term "diversity" refers to the identities we carry.[1] This includes race, gender, sexual orientation, class, age, country of origin, education, religion, physical or cognitive abilities, and other characteristics. Historically, these differences among people have evolved to define relationships based on power and the access to, and the possession of, goods, services, and wealth.[2] Over generations, the unequal distribution of these privileges has contributed to systemic and structural injustices. Further, discrimination based on the diverse features of one's identity is not always conscious or explicit. It can instead be embedded in laws, practices, and beliefs that perpetuate unfair treatment.[3,4]

Systemic inequalities also permeate into the field of health care, ultimately impacting the health outcomes of historically marginalized populations.[5] Racism, sexism, homophobia, and other forms of discrimination can cause some Americans to receive worse care than others. Recent world events, such as the disproportionate impact of the COVID-19 pandemic, have accentuated this injustice.[6] Differences in access to care, social determinants, provider biases, and poor health literacy are just a few reasons that explain these phenomena.[7] Almost 20 years ago now, strategies were proposed by the United States Institute of Medicine and the American College of Physicians to address these disparities. This included increasing awareness of disparities among health professionals, diversifying the

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workforce, and ensuring the availability of language interpretation services.[8-10] Yet, despite decades of research and public health initiatives, such health care disparities sadly persist.

Thus, the importance of integrating the principles of diversity, equity, and inclusion (DEI) into medical education cannot be overstated. The overall goal of a medical education is to prepare individuals with the knowledge, skills, and attitudes necessary to provide effective, compassionate, and evidence-based healthcare to all patients. With such a large undertaking at hand, the Association of American Medical Colleges (AAMC) has created a series of guides detailing the competencies required for a successful career in the rapidly changing landscape of healthcare. The AAMC's *New and Emerging Areas in Medicine Series* is described as "a guide for everyone who develops curricula within the field of medicine and for people learning to practice or continuing their professional development."[5]

The most recent installation in this series, published in 2022, is the guide on *Diversity, Equity, and Inclusion Competencies Across the Learning Continuum*. While the intended use of these cross-continuum competencies is to help educators design or adapt curricula to enhance professional development, they may also be used to conduct gap analyses of DEI principles within curricula.[5] This analysis may be easier to conceptualize when imagining a traditional lecture-based medical school curriculum, in which educational goals or learning objectives (LOs) are written by faculty. However, student-centered teaching modalities like problem-based learning (PBL) have grown in popularity and practice in various educational settings, including medicine.[11] In fact, studies examining LOs generated by both students and faculty suggest that the two are equivalent in breadth and depth.[12] Yet, this apparent congruence between faculty and student generated LOs deserves further examination.

At one Northeastern U.S. medical school, medical education takes the form of small discussion-based groups that focus on students' experiential case learning. First year medical students are responsible for writing their weekly LOs in each of the school's four pillars: Basic Science, Clinical Sciences, Health Systems Sciences, and Health Humanities. LOs for the Health Humanities (HH) pillar provide a unique opportunity for students to think about relationships between medicine and DEI. The aim of this study is to provide initial descriptive reports of the extent to which HH LOs created by students in this self-directed curriculum address the AAMC DEI competencies expected to be developed by the time of graduation.

In addition to the number of DEI competencies addressed by the student generated HH LOs, the "depth" of learning within the three domains of DEI was also measured using Bloom's taxonomy. More specifically, the verbiage of HH LOs was assorted among the cognitive skill levels of Bloom's taxonomy, which contains six categories:1) Remember, 2) Understand, 3) Apply, 4) Analyze, 5) Evaluate, and 6) Create. These levels range from lower-order skills that require less cognitive processing, such as sheer memorization, to higher-order skills that require deeper learning and a greater degree of cognitive processing, such as constructing a new point of view.[13]

Methods

In the 2022-2023 academic year, (class size = 13) students in the class of 2026 at a Northeastern medical school created LOs in the following pillars as part of their first year curriculum: Basic Science, Clinical Sciences, Health Systems Sciences, and Health Humanities. All students in the class contributed to LO creation. Before writing LOs, students were introduced to Bloom's taxonomy and provided with an example case plus sample learning objectives prepared by the course directors. Each week, students took turns presenting cases they had seen in clinic, and then, following a class discussion, they generated LOs based on the details of those cases.

For this analysis, the Health Humanities (HH) LOs were chosen for further evaluation. A conceptual analysis of each of the HH LOs (n=87) was conducted using diversity, equity, and inclusion competencies (n=24) from the AAMC's *Diversity, Equity, and Inclusion Competences Across the Learning Continuum* guide.[5] In this guide, the domains of diversity, equity, and inclusion are broken into five, eleven, and eight individual competencies, respectively, for a total of 24 competencies. Two raters independently coded each

learning objective, considering if each competency was addressed by each learning objective (yes/no). For instance, the AAMC diversity competency (*1a)* is "Demonstrates evidence of self-reflection and how one's personal identities, biases, and lived experiences may influence one's perspectives, clinical decision-making, and practice." Raters evaluated if each LO addressed the competency. Inter-rater reliability via Cohen's kappa was calculated for further validation. Typically, Cohen's kappa greater than 0.8 is consider excellent inter-rater reliability. Any disagreements between the two independent coders were mediated by a third research team member. If any of the individual competencies under the three domains of diversity, equity, and inclusion were met by the LO, this LO was considered to have addressed the domain to which that competency belongs.

Depth of learning was operationalized using Bloom's taxonomy, a classification system broken down into the categories of remember, understand, apply, analyze, evaluate, and create (see *Figure 1*). In this system, *remember* represents the most basic and superficial level of learning, and *create* represents the highest and most in-depth level of learning. A conceptual analysis by one coder was conducted to assess what level(s) of Bloom's taxonomy were addressed by each LO (yes/no). This analysis was then combined with the previous conceptual analysis of LOs and DEI domains to identify how many times Bloom's taxonomy categories were used in each DEI domain. The decision to conduct this study was made in the students' second year of medical school, after they had completed the first-year curriculum and its LO-writing process.

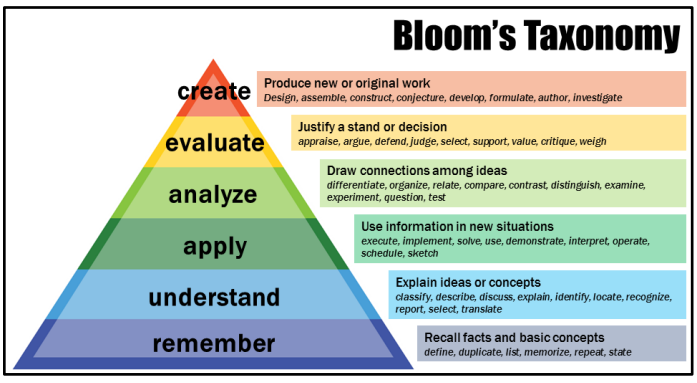

Figure 1: Bloom's taxonomy.[1]

Results

DEI Competencies

Cohen's Kappa was calculated to be 0.93. Of the 87 Health Humanities LOs written by first-year students, 78.2% (n=68) addressed at least one of the AAMC DEI competencies. Collectively, these LOs covered 91.7% (22/24) of all AAMC DEI competencies at least once. 63.2% of LOs addressed at least one diversity competency (n=5), 52.9% of LOs addressed at least one equity competency (n=11), and 49.4% of LOs addressed at least one inclusion competency (n=8) (see *Table 1*).

The AAMC competencies are grouped into sub themes within diversity, equity, or inclusion. Although diversity was the most frequently addressed, all health humanities learning objectives fell in the theme "Advancing diversity and integration in practice" and none of them fell in the category "Advancing for a diverse healthcare team and system." Inclusion was also commonly addressed specifically with competencies about "fostering belongingness" and "Providing Culturally Responsive Patient Care" (see *Appendix A)*[2]. In the first year, student written LOs least commonly addressed competencies in the inclusion category.

Proportion of Learning Objectives Addressing Diversity, Equity, and Inclusion Based Competencies

AAMC Domain	% of Learning Objectives
Diversity	63.2%
Equity	52.9%
Inclusion	49.4%

Table 1: Percentage of HH LOs (n=87) that addressed at least one of the DEI competencies the AAMC expects medical students to develop by the time of graduation.

Bloom's Taxonomy

Several LOs addressed multiple levels of Bloom's taxonomy. Overall, *understanding* was the most used level (n = 81), while *evaluate* was the least used (n = 17) (see *Figure 2*). When applied to DEI domains, LOs that fulfilled the diversity domain were most commonly at the *understand* level of Bloom's Taxonomy (n=52). 59.8% of the total HH LOs met these criteria. LOs that fulfilled the equity and inclusion domain were most commonly at the

understand level of Bloom's taxonomy as well (n =39, n =43), comprising of 44.8% and 49.4% of the total HH LOs respectively.

Only 9.2% of the HH LOs met the criteria for both the AAMC domain of Equity and Bloom's taxonomy level *apply* and *evaluate.* For every level of Bloom's taxonomy, the diversity domain had the most LOs that prompted students to reach that level. The deepest level of Bloom's taxonomy, *create*, was addressed 38 times between the three AAMC DEI domains, while the most basic level, *remember*, was addressed 86 times (see *Table 2* and *Figure 3*).

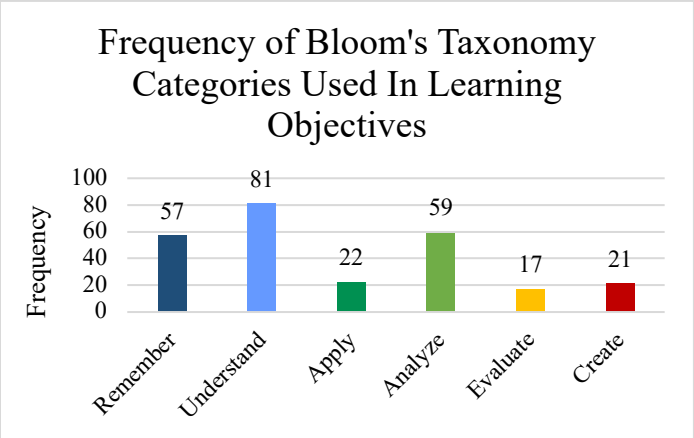

Figure 2: Bar chart showing the number of times HH LOs addressed each of the Bloom's taxonomy levels.

Bloom's Taxonomy Levels	AAMC Domain		
	Diversity	Equity	Inclusion
Remember	35.6%	36.8%	26.4%
Understand	59.8%	44.8%	49.4%
Apply	16.1%	9.2%	17.2%
Analyze	48.3%	36.8%	36.8%
Evaluate	14.9%	11.5%	13.8%
Create	16.1%	9.2%	18.4%

Table 2: Percentage breakdown of HH LOs (N=36) that fulfilled each AAMC domain and Bloom's taxonomy level.

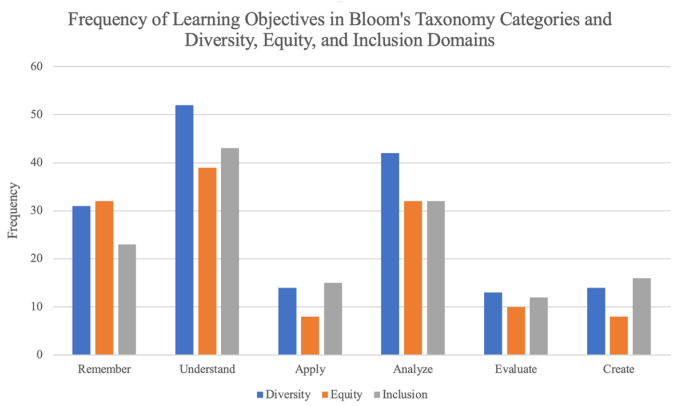

Figure 3: Comparison of LOs that addressed Diversity, Equity, and Inclusion AAMC domains for each of the Bloom's Taxonomy levels.

Discussion

Even though most studies on the efficacy of PBL have tended to focus on medical education, few have analyzed the coverage of health humanities principles, specifically DEI.[11] We have found that student generated HH LOs, guided by their own interests and without referring to the AAMC DEI guide, successfully fostered a deep level of learning and coverage of DEI competencies. Approximately 80% of LOs addressed at least one component of the diversity, equity, or inclusion domains. Collectively, these LOs covered about 90% of individual AAMC DEI competencies at least once in just this first year alone. This data is encouraging and shows that medical students at this institution demonstrate a strong desire for the integration of DEI principles into their education from the beginning of medical school.

HH LOs developed early in the year tended to be focused within the AAMC domain of diversity with the use of verbiage indicative of a superficial level of learning according to Bloom's Taxonomy. However, we believe that as students grew familiar with the process of LO generation, the path to deeper-level learning was more readily identified. In general, over the course of the academic year, students tended to use verbiage at the level of understand within Bloom's Taxonomy. We recognize this can be interpreted as an unwillingness to dig deeply into DEI principles. However, this may also be because higher-level learning, at the create level of Bloom's Taxonomy for example, can only be achieved once a

basic understanding of a concept has been developed.[14] Similarly, a potential hypothesis for the less extensive coverage of equity and inclusion principles may be due to a necessary period of prerequisite knowledge attainment. Future studies may be able to explain this finding by performing a comparative analysis of student generated HH LOs over multiple academic years. Additionally, surveys may be administered to first year medical students to assess changes in self-reported confidence levels in the skill of LO generation, as well as overall interest in the principles of DEI.

Limitations of this study include a small sample size of HH LOs (n=87). Without comparing our findings to an analysis of HH LOs in previous years, it is difficult to confidently determine whether the patterns are consistent over time. Another limitation of this analysis is that student researchers analyzed LOs they had helped create, which may introduce bias. However, this study was not conceived until after their first year, making it unlikely that their LO creation was influenced by the knowledge that it would later be analyzed. Additionally, writing LOs is a learned skill, and students likely varied in their experience with this process. As a result, LO verbiage may not always reflect how deeply students engaged with DEI concepts. Despite these limitations, the researchers are committed to improving how DEI is addressed in medical education and plan to expand this project to include LOs from previous years written by different cohorts. Finally, because the AAMC DEI competencies are meant to be met by the start of residency, this study only captures a small portion of a student's overall DEI learning, as it focused solely on first-year HH LOs.

We believe this initial descriptive analysis of the HH LOs of a student-led medical curriculum lends additional support to the assertion that PBL is both effective and comparable to traditional lecture-based learning.[15-17] It also provides a starting point for further studies on the extent of student-led interest into the principles of DEI. We know that diversity alone does not necessarily guarantee social cohesion. Effort must be made to promote tolerance and respect for diversity in diverse societies. To actively oppose the structural inequalities woven into the fabric of medicine, we must continue to intentionally address DEI competencies in medical education.[18]

Conclusion

The majority of the AAMC's DEI competencies are addressed by first year medical students at a Northeastern U.S. medical school within the first year of school. Future studies should analyze the learning objectives of past classes to determine further significance and identify potential discrepancies.

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