# Diversity and Inclusion in the Science Classroom

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#### Abstract

A Diversity, Epidemiology and social justice unit was incorporated into the Physiology and Disease curriculum in Fall 2016. Students discussed topics such as social and cultural influences on diversity thinking, and selective treatment in hospitals based on race. It was very noteworthy that students were united in their thinking regarding diversity and inclusion, despite the fact that they were from different backgrounds and diverse cultures. In 2017, additional discussions were held on equity in education. Students who were otherwise reserved were encouraged enough to express their views, and everyone appreciated the fact that they had been included.



# Rationale for Diversity Unit in Science Classroom

Humans are by nature egocentric and socio centric as well. We believe that the groups we belong to are right, privileged, special. We systematically deceive ourselves into thinking that we are right, we avoid recognizing our biases and treat people and groups without due consideration and respect, even when there is clear evidence to refute our point of view. (Elder, 2004).

Elder, L. (2004). Diversity: Making sense of it through Critical Thinking. The Critical Thinking Community.



#### **Rationale continued**

Through this unit, I hope to teach students to be aware of, and to guard against, their native egocentric and socio centric tendencies. Otherwise these tendencies will keep them from reasoning well through diversity issues.



#### Rationale continued

 Students at the Illinois Mathematics and Science Academy are selected for their aptitude in Math and Science

 Perception of inequality and exclusion among gifted population

 Promote awareness of natural egocentric and socio centric tendencies

○ Reason unbiasedly through diversity issues



# Introducing Diversity in the Science Classroom

 A Diversity, Epidemiology and social justice unit was incorporated into the Physiology and Disease curriculum in Fall 2016

• PAD is a Biology elective for juniors and seniors at IMSA that deals with changes in homeostasis in the human body and its outcomes, as well as pathophysiology of disease formation.

• The diversity unit was integrated into the nervous system unit because this seemed to be the best fit in the curriculum.



# **Diversity Curriculum Introduction**

O Students were given diversity topics and were provided with an introduction, rationale, recent events and a list of readings for these topics.

• They were required to synthesize the information with recent events and create a short presentation building specific case studies for discussion with their peers.

O Emphasis was placed upon discussions dissecting the ethics and moral dilemmas of recent events in the light of the background provided.



# Incorporating Diversity Curriculum

• Two sections of 20 students each were provided with background information and asked to present to each other during the 100 minute class

• Students brought up many interesting views but were united in their thinking

• This was very noteworthy considering the fact that they were all from different backgrounds and diverse cultures.



# **Diversity Discussion Topics**

Some of the topics discussed included:

- Brain preferences in terms of diversity
- Social and cultural influences on Diversity Thinking
- Diversity Development in the Brain
- Early development of diversity thinking
- Social justice and epidemiology and
- Selective Treatment in Hospitals Based on Race



# Student Reflections on Diversity Discussions

• Students independently incorporated cases of social injustice against people of color into every single topic discussed.

• Students discussed causes for social injustice such as disparity in income, lack of education, and lack of tolerance toward people of other races.

• An interesting case study discussed was that of identical twins brought up in different environments, one tolerant and the other not tolerant toward people of color, and following their path through adolescence and adulthood.

• Their discussions brought forth many aspects of diversity that enhanced their learning by integrating real life experiences.



# History of Diversity in Physiology

• In Fall 2017, students were introduced to additional diversity awareness through the development of the history of physiology and medicine.

• Special emphasis was placed upon social, racial and gender barriers.

 Students presented information from scholarly papers provided to them to set the background.

• They then discussed the situations presented and took sides voicing their opinions.



#### Whys is this photograph significant?



October 10, 1885 Dr.Anandabai Joshee,Seranysore,India Dr. Kei Okami, Tokio, Japan Dr. Tabat M. Islambooly,Damascus,Syria



#### First Women Physicians in World History



Dr. Tabat M. Islambooly.Damascus.Syria

https://s-i.huffpost.com/gen/1072427/images/o-WOMEN-DOCTORS-1885-facebook.jpg



## Firsts in History

 Three women, each the first woman from their respective country to graduate with a medical degree, made history when graduating from the Women's Medical College of Pennsylvania in 1886.

• What were the circumstances that led to these historic events?

O How has diversity impeded or enhanced medical education?



# Recognize this photograph?





# Brown vs Board of Education, 1954

School Segregation Banned, the Topeka State Journal. Courtery Kanas State Historical Society

FOLKS AND THINGS STATE PEKA JOURNAL By 2054 This Home Edition Bill Should By Mauffre Publications, Inc. Topeka, Kansas, Monday, May 17, 1954 -- Twenty-four Pages **Be Terrific Gillulal Olly Paper** FIVE CENTS In COLUMN 1, DAMAGE The second secon INELY it was that Jm but a Bruitharm appage ad arrest of her hard a live granulater/s -good Dessors Turnpike Bonds Supreme Court Refutes arized So loday. **Doctrine of Separate** education is but Equal Education perhaps the most important function of state and local gov-High Tribunal Fails to Specify When Practice ernment. Complusory school attendance laws and of Dual Schools Must Be Drooped by States Washington, May 11 (45-The Supremy court ruled searchronaly the great expenditures for education both demonstrate our gregation of Negro and whits students in public achools is upresentitutional. said it will hear further arguments this fail on how and when to end the practice. Thus many months recognition of the importance of education to our democratic society .... on more time will tore the historic Court Ruling Hailed WE CONCLUDE THAT IN THE FIELD OF PUBLIC EDUCATION arregation Already Ending THE DOCTRINE OF 'SEPARATE BUT EQUAL' HAS NO PLACE. SEPARATE School Officials EDUCATIONAL FACILITIES ARE INHERENTLY UNEQUAL. 9 9 "s Topska Roard of Oliver L. Brown, et al. vs Board of Education of Topeka, Kansas, United States Supreme Court, May 17, 1954. which ruling true de https://www.archives.gov/publications/prologue/2004/spring/brown-v-board-2.html



# **History of Education**

 Education has always been a privilege. Most of us do not realize this.

• Opposition to the implementation of diversity and social equality has littered history.

• The Brown vs Board of Education (1954) is an example of protests to remove impediments to education.









# Selma to Montgomery March, 1965





http://www.history.com/topics/black-history/martin-luther-king-jr/pictures/ martin-luther-king-jr/mlk-1965-selma-montgomery-march-3

# **History of Education**

• Civil rights were not always available to all. This is hard to fathom under present day circumstances

• There has always been sever opposition to the implementation of social equality

• The Selma to Montgomery March (1965) is an example of protests to remove impediments to civil rights.



# **History of Inventions**

 Many modern inventions and improvements were conceived under circumstances that included dire poverty and social inequality

#### O Examples are

O George Washington Carver (peanut farmer and inventor)

O Otis Boykin (constructed resistor and control unit for pacemaker) and

O Garrett Morgan (invented a breathing device, hair straightener and automated traffic signal, also famous for his heroic rescue of workers trapped in a water intake tunnel in 1916, 50 feet below Lake Erie)





 It would greatly benefit our students to be aware of the diversity, or lack thereof, of the times when these inventions and discoveries were made

• They can appreciate better the circumstances of these discoveries and their modernization



## What Will Students Do?

Students will focus on specific events in the history of education and medicine and lead short discussions on
O the ethics of the decisions made
Othe modern reaction to these events and
Ohow knowledge of these events might improve their education and social awareness of justice and equality





• The success of this project has set the stage for development of diversity curriculum for other disciplines and other schools in the state of Illinois

• The ease of inserting this unit into an advanced biology course is encouraging and suggests that incorporation into other disciplines should be a smooth transition

• Students greatly benefit by relating to and thinking about diversity with respect to their learning

• Steps are under way to further develop this curriculum and train other educators to do the same in their academic institutions





 Steps are under way to include curriculum on LGBTQ1+ awareness

• Work is under way to document these classroom experiences in a publication

