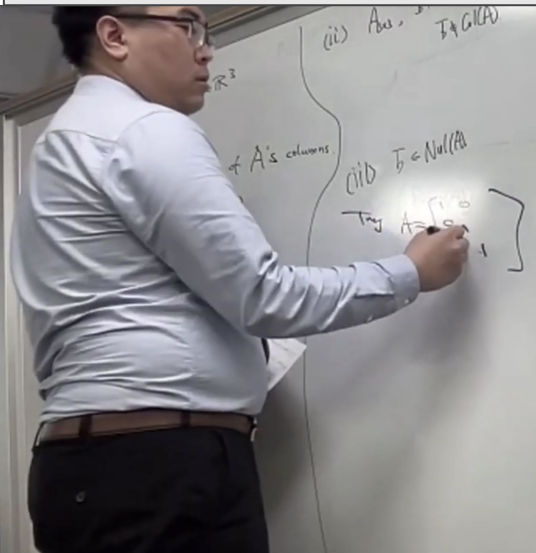


A Follow-Up Reflective Argument on Collegiate Mathematics Literacy in the Jewish Education Context: One Year After the Assisted Linear Algebra Classroom

(Sün, D. T., March 2025)



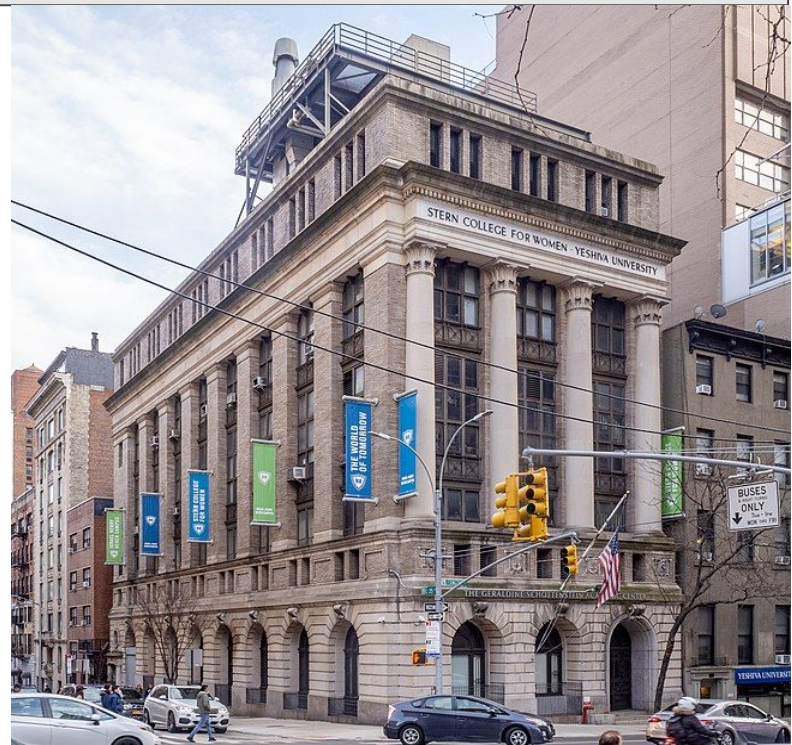
An attempt on both the status quo on one end, and on the other end the special, uniqueness of angles of women's math, science and STEM education, in particular in a Jewish institution context.

Potential Keywords: *modern women's colleges, literacy, real-world problems, interpersonal scientific communication, virtues, Jewish education*

(from the 10th week 10 of my "recitation" hours for linear algebra practice problems, using a regular whiteboard in the classroom—Spring 2024 semester at Yeshiva's midtown campus)

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Women's Colleges

From *Women's Colleges in the United States* (Harwarth, I. et al., 1997)

- ❑ Definition of a Women's College: ... with an “institutional mission primarily related to promoting and expanding educational opportunities for women.”
- ❑ Women's colleges began with some developments of private secondary schools for young women, or “seminaries,” during the early 1800s.
- ❑ Founding of women's colleges during the mid- and late-19th century “in response to a need for advanced education for women at a time when they were not admitted to most institutions of higher education.”
- ❑ Challenges faced as more colleges became coeducational since 1960s-1970s, when
 - (i) several all-male schools began accepting women, and
 - (ii) many women's colleges either became coeducational themselves, or got merged with all-male or co-ed. institutions (and some others stop opening/closed their doors).

Some conservatively “intrinsic” strengths for young women's college students, in terms of math and science: patience, memory span, study habits, manners and civility... regarding these positive-side potentials, the immediate question would be “**does a women's college foster them in a unique, exclusive way as compared to co-educational environments?**” The counterpart argument is that what could possibly weaken learning and lived experiences, at (...)

Women's Colleges (cont.)

(...) the “price” that a rather-simpler co-ed classroom is preferred? – note that the organizational management, including the recruitment of faculty, staff, graduate student assistants, etc. are expected to be easier for the latter.

“After arriving on campus, they are more likely to report positive social experiences and interactions with diversity during their first year, though this difference is eliminated in subsequent years. They are also more likely to hold leadership positions and somewhat more likely to switch to and persist in STEM fields” (Wisner, 2013)

Wisner, Teresa, “Why Women's Colleges?: Reassessing the Benefits of Single-Sex Higher Education for Women” (2013). Honors Thesis Collection. 106. <https://repository.wellesley.edu/thesiscollection/106>

Abstract Classrooms that are both modern and urban in math courses, especially beyond the freshman collegiate level, are seemingly expected more as a role of preparatory training for “literacy skills” such as quantitative writing, applying the real-world problems, and interpersonal scientific communication in forms of group projects and presentations. This is nonetheless a pedagogical, if not singular nor pragmatic, view that is wishful but in fact important as a reiteration in today's climate of collegiate education.

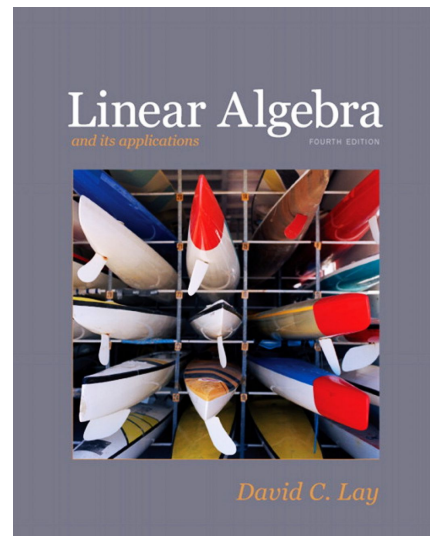
By my observation, young women students of science and mathematics normally have a longer patience and attention span and a baseline reputation of completing the curriculum well and keeping good learning habits, however how to (re)examine the role(s) of university math courses in students' collegiate curricula remains yet a necessity, in terms of both sustaining motivation and solidifying the quality of the curriculum itself.

With a Jewish education as environment regarding the bachelor's degree programs relevant to math and computing, this reflection and argument attempts to provide what the author observes in the past two to three semesters as course assistant and occasional peer classmate to students in more than three recent courses, following his presentation here last year, about the same features and observations based on his somehow minute lens. Based on the individual student's academic and economic expectations, it is argued that an iterative refinement paradigm to coursework as well as notes-taking is exclusively beneficial to the “parallelism” between a religious tradition and contemporary pursuits.

One Year Ago, My First Day's Logistics as Assistant...

Agenda:

- ❑ test proficiency of technology and run diagnostics (e.g., white board, marker pen, any HDMI cables to connect to monitor display, etc.)
- ❑ inform that I will be here for recitation meanwhile the instructor cannot make it at this hour on Tuesdays..
- ❑ oversee upcoming recitations this Spring
- ❑ introduce “Lab 1” material with the audience to explore with
- ❑ given sufficient time, plan on watching video “The History of Linear Algebra”
- ❑ tentatively introduce some optional readings (under “Week 2”)



Linear Algebra [recitation]

"Systems" of Linear Equations [ch.1] [Linear Systems & Matrices, 'Elementary' Row Operations & Echelon Form & Row Reduction Algorithm, ..](#)

Matrix Algebra [ch.2]

Determinants [ch.3]

Vector Spaces [ch.4]

Eigenvalues/Eigenvectors [ch.5]

Orthogonality, Least Squares [ch.6]

A Glimpse of Comparison: Along-Side with the Other Gender at the Same Institution

(Attributes)	Women's College (Stern)	Men's College
Interruptions w/o Raising Hands	rarely to none (with 23+ students)	nearly none (with 35+ students)
Note-Taking and Engagement Level	standard to high, provided not absent-minded	average to high, some absent-minded
Collaborative and Presentation Work	talked to the audience/more in the moment; collaborative	relatively swift in pace; collaborative
Handwriting	nicer	more rough
Absent-Minded "Spaced-Out" Moments	sometimes	nearly often
"Obvious" Gossiping	rarely	sometimes/often

A More Scholarly Lesson Plan

... if into the graduate level, it is arguably beneficial to study (the same) material using a few more languages...

Mathematical Communication Across Linguistic Contexts

[time and location] with D. 'Tony' Sun (dsun2019@hotmail.com)

[semester if any] | [Syllabus.PDF] | [---anything-else---]

Primary References

Daepf, U., & Gorkin, P. (2011). *Reading, Writing, and Proving: A Closer Look at Mathematics*. Springer New York Dordrecht.

Week 1 (__time date__)

[Recordings of ...]

- [.pdf]

Maybe just about "notation" by content, dive into the following languages including: (notes)... German/Deutsch, French, Japanese, Italian, (below) Swedish, -- while "comparing" these languages, teach/learn a minimum skillset to be literate of these notations.
Given a non-empty set S , ..., find the open ball of "some" (rather than "any") element ..

- [.pdf]

Reading: Klisinska, A. (2009). [The Fundamental Theorem of Calculus: A Case Study into the Didactic Transposition of Proof](#) (Doctoral Thesis, Luleå University of Technology).
[Brehmer, D. et al.](#) (2016) regarding upper-secondary math in Sweden.

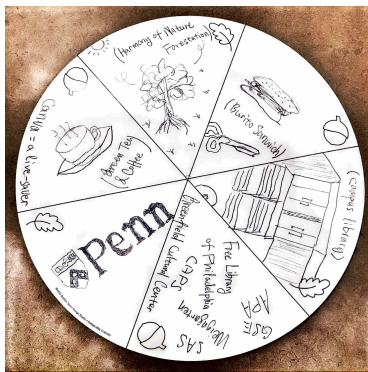
What to Expect

- 1) preparatory training for "literacy skills" such as quantitative writing, applying the real-world problems, and interpersonal scientific communication in forms of group projects and presentations—pedagogical, if not singular nor pragmatic, view that is wishful but in fact important as a reiteration in today's climate of collegiate education.
- 2) a longer patience and attention span and a baseline reputation of completing the curriculum well and keeping good learning habits.
- 3) (re)examine the role(s) of university math courses in students' collegiate curricula remains yet a necessity, in terms of both sustaining motivation and solidifying the quality of the curriculum itself.
- 4) regarding the Jewish education context: bachelor's degree programs—relevant to math and computing
- 5) based on the individual student's academic and economic expectations; what can be described or defined as an iterative refinement paradigm to coursework as well as notes-taking. This is paralleled with a religious tradition, as well as contemporary pursuits.

(to be continued..)

Summary: if a "status quo" is the content of the curriculum, the pre-professional component of collegiate life in a heavily urban setting, and religious tradition—then the "stride" needed in such environment is going to be in two-folds (and beyond): the reevaluation of academic integrity, any "defense" against disruptive tech/innovation/any tool that is hindrance to intellectual growth, and **scientific literacy and communication skills** in general.

About Me (Currently of M.A. in Mathematics Program at Yeshiva)



mathematical
analysis (e.g., metric
spaces), multivariate
Calculus (vector and
tensor algebra), and a
few projects on
political philosophy
jurisprudence

Fall 2023-Now: Mathematics

Reading/Writing “Literacy Education” at the University
of Pennsylvania (2021-22)

Computing Science: Computer Graphics, and Image
Analysis and Computational Photography/Geometry
Algorithms (2014-18)

Engineering Student in College (pre-2014)



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