Engineering Education in Times of War, Upheaval, and Revolution

Prof. Amy E. Slaton, Drexel University

Amy E. Slaton is a Professor Emerita of History at Drexel University. She writes on issues of identity in STEM education and labor, and is the author of _Race, Rigor and Selectivity in U.S. Engineering: The History of an Occupational Color Line_.

Prof. Sepehr Vakil, Northwestern University

Sepehr Vakil is an assistant professor of Learning Sciences in the School of Education and Social Policy at Northwestern University. Previously he was Assistant Professor of STEM Education and the Associate Director of Equity & Inclusion in the Center

Engineering in Times of War, Upheaval and Revolution

Bringing Geopolitics to Engineering Education

It will surprise few of our readers within the LEES or ECSJ Divisions of ASEE that this paper starts by recognizing the significant roles historically played by engineers in global political developments, whether during episodes of industrialization or imperialism, capitalist retrenchment or revolutionary uprising, in ending famines or accelerating climate change. These roles have been clear to historians and policy makers for many generations, and to some engineers. Yet as matters for explicit address in engineering education over recent decades, they have rarely been taken up. Only a select set of observers has imagined that critical attention to such roles is a necessary part of responsibly preparing professional engineering personnel; we include among these observers some communities within the ASEE and the International Network for Engineering Studies (INES) and notably, the international organization, Engineering, Social Justice and Peace (ESJP). We support the thorough incorporation of geopolitical understandings into engineering training and focus here on one element of this critical engagement: experiences of national identity among engineering students, as part of both hegemonic state-making projects and projects of resistance or revolution.

The complex historical entanglements of ideas of nationality and the conducts of engineering have been richly described by scholars in recent years, with critical accounts centered on engineers' roles in the perpetuation of nationalism, imperialism and fascism [1] - [5]. Other studies have described pivotal support by engineering professions for anti-militarism and resistance or revolutionary movements [6], [7]. This literature helps us outline the broad conditions in which contemporary engineering aspirants pursue their technical training and establish their own civic standing, with notable ideological multiplicity. Instances of war, upheaval and revolution allow us to see explicit efforts of this kind, but we do not mean to suggest that such crises produce exceptional experiences of either national belonging or alienation. Centrally, we build here as well on emerging methodologies of transnational history, which take the entire notion of "nation," let alone experiences of nationality, as far more indeterminate and relational than did previous historical approaches.

With the transnational turn, historians have problematized the processes by which individuals and communities come to think of themselves as innately part of one geography or another, and how state apparatuses achieve stability and power around the concept of nation. We see the *possibility of nationality* as itself historically determined, and the hermeneutics of nationality as contingent on the nuances of place, culture, and politics. The politics of patriotism, then, must be understood within the particularities of historical and sociopolitical processes. Engineering as both instructional topic and professional field of practice is deeply implicated in and shaped by these conditions. Recent interventions by U.S. lawmakers regarding campus activism during the war in Gaza provide yet another instance in which institutions of higher education are expected to support selected national interests—with a very particular geopolitical agenda projected for the nation. Students, faculty and staff who are critical of U.S. imperialism and war are at this

time at risk of expulsion, firing and/or arrest. Given such historical and contemporary episodes, we outline here the ways in which emerging scholarship on engineering education might frame a more engaged, critical and politicized sensibility in the twenty-first century engineering curriculum. How are nationality (and nationalisms) conforming the experiences of Engineering teachers and learners? We ask, that is, how it is that an individual identifies themself with both an ethnic or national collective and the putative universality of technoscience, or finds themself struggling to do so.

For this brief overview of interrogative possibilities, we work with the case of two influential nodes of global engineering education as they functioned in an especially fraught geopolitical moment: the Massachusetts Institute of Technology (MIT) in the United States and Sharif University (previously Aryamehr University of Technology) in Iran as the schools operated in the second half of the 1970s. Amid intense global jockeying for late-Cold War influence and rising nuclear capacities, both institutions functioned within geopolitically determined conditions through relationships with their governmental and industrial sponsors, and in Iran, also within a revolutionary context. On both campuses students and faculty expressed a range of political ideologies centered on ideas about government and nationality as those might optimally shape engineering practice, playing variable roles in the schools' affiliations with state interests. On both campuses we find multiple ideologies being voiced, but we also trace materially connected interests between MIT and Sharif. Our aim in this brief essay is to suggest the questions of importance to Engineering education that could be raised about this case and others if we were to take seriously our accountability, as engineering educators, to flows of global power and the projects of state-making.

Below, we will first describe political sensibilities among engineering students and faculty at MIT and Sharif in the 1970s, addressing the different roles played by personal political identification in each setting. Then we will articulate some critical framing for broader application; that is, asking how we can best provincialize "nation" and "engineering" as sociopolitical categories to understand what exactly engineering education might usefully help students interrogate if they are to be responsible political actors. Finally, we will describe what we see as opportunities and impediments involved in attending to the (usually silenced) politics of engineering education in this way. We will touch on how we expect to encounter these opportunities and constraints in current STEM educational systems generally, and then, how we might further involve selected ASEE communities or the overall organization as a platform for such engagement.

Engineering in/for a Nuclear World

MIT was founded in Cambridge, Massachusetts in 1861 with the use of federal funds, part of a much broader U.S. initiative to provide technical education in support of the country's economic modernization and interests beyond U.S. borders [8]. Always closely affiliated with U.S. commercial and military stakeholders, leaders at MIT directed engineering research and instruction through the twentieth century towards enhancing national security writ large (that is, including both defense-related projects and research in support of industrial development). By the 1950s, national efforts to formulate Cold War policies heavily dependent on applied science

brought MIT's then- president, James Killian, to a role in the White House, with, as Juan Lucena writes, "scientific academism" finding a solid footing in U.S. foreign-policy making [9]. In broad terms, the post-War U.S. research university involved "increasing inter-connections between the university and the wider society," positioning itself as "embedded in social structures that derived from histories of colonialism and Empire" [10]. MIT was in no sense unique among research institutions in tying itself to U.S. geopolitical interests but with its very high standing among universities it achieved an extraordinary level of influence and funding during the second half of the twentieth century.

In June 1971, Gordon Brown, formerly dean of Engineering at MIT, accompanied by advisors from the international consulting firm Arthur D. Little, arrived in Iran with the purpose of developing a comprehensive plan to develop a satellite campus of Aryamehr University of Technology (AMUT) in Isfahan, the third largest city of Iran located approximately 200 miles south of capital Tehran. AMUT had been established just 5 years prior by the Shah of Iran as part of a larger campaign to modernize the nation including Iran's military capabilities. Thirteen years later engineering students at AMUT played a critical role in the 1979 revolution that overthrew the Shah and his regime. Now known as Sharif University of Technoloogy, the school continues to be widely recognized, both for its reputation as the most prestigious engineering institution in the Middle East, and for its legacy of radical student activism and protest [6].

The establishment of AMUT occurred in 1965 within the international context of the Cold War, as well as the institutional ascendancy of U.S. science and engineering in federal policy-making. U.S. priorities regarding foreign relations had since World War I exerted increasingly direct influence on higher education [8], [9]. Further, the specific institutional relations formed between AMUT and MIT reflect the friendly relations between the U.S. and Iran in the 1970s, and routine educational and cultural interactions between the nations in that era [11]. Mutual national interests and reciprocity were built into the fabric of U.S.-Iran relations. For the U.S., the Shah was the most significant strategic ally in the Middle East, truly an unimaginable feature of U.S. policymaking in the current geopolitical context. Further, as early as the 1950s, the Shah had actively recruited those he deemed the most talented of Iranian students to attend Western institutions for graduate education and return with advanced skills to lead the industrial and scientific modernization efforts underway in Iran.

On the other side of the Atlantic, in the 1970s, MIT's contributions to hemispheric security, as was the case with many premier technoscientific institutions globally, centered on issues of nuclear capability. The possibility that nations beyond the identified super-powers or established U.S. allies might create nuclear weapons programs dictated vast swaths of Western scientific funding geared towards equipping "friendly" powers. U.S. universities had a long history of training international engineers as part of the drive to develop potentially allied nations and create fidelity to and technoscientific dependence upon U.S. interests. Among modernizing technoscientifc sectors, nuclear science and engineering assumed this role prominently after World War II, given, as Krige and Wang summarize, the "significance of atomic weapons, nuclear reactors, rockets, and satellites as quintessential markers of security, modernity, and national prowess":

> Powerful states deployed such dual-use systems both to defend the realm and as forms of technological spectacle intended to secure allegiances in a dangerously divided and fluid international order [12].

At MIT, the mid-1970s brought a decision to train 54 graduate students from Iran in Nuclear Engineering, a dramatic endorsement of the Shah's nuclear aspirations. The institute could draw on programmatic support for Iran as framed by the federal government; the Agency for International Development (AID) depicted Iran in this moment as "receptive to foreign capital investment," and as a "stabilizing force in the Middle East and South Asia." To support the training of nuclear engineers for Iran could thus make of MIT, in AID's view, "an important contributor to U.S. objectives for peace, social progress and mutually beneficial world trade" [13].

In addition to the formal institutional relations operating between the two universities, we note the significant role of several individuals who were key players in the developing relationship between the two campuses. In 1972, Seyyed Hossein Nasr was appointed by the Shah as his successor. Nasr was influenced by James Killian, who served as president of MIT from 1948 to 1959. Under Killian's leadership, MIT experienced significant growth, including the addition of the School of Humanities and Social Studies, the Sloan School of Management, and the Center for International Studies. In 1972 efforts were made to expand the humanities and social sciences disciplines at AMUT. The university established the Center for Humanities and Foreign Languages with the aim of conducting research that explored the intersection of technology, society, and human culture [6].

Engineers in their Place, and Out

Our aim with this discussion is to indicate the complex factors influencing the political vantage points of engineering students and faculty, rather than project authoritative professional or disciplinary outlooks (such as those of MIT or Sharif's leadership) upon that wide and varied population. Put simply, both schools housed some students and faculty who supported and participated in the advance of nuclear capacity in Iran, some who remained silent on the matter, and others who formulated programs of reproval and resistance. In this last category, voices can be found focused on geopolitical conditions, on individual states' ideologies, and on nuclearity in particular. In the small space we have here, we want to sketch some of these commitments, especially against a backdrop of what it meant in these settings to "belong" to both the field of engineering and to a particular national, ethnic or political community. Attending to the roles played by these identifications (which are of course inseparable from those of race, ethnicity, gender, and others) counters the framing of engineering as in any instance an apolitical or nonpolitical space; that is, as one which could conceivably be "depoliticized" in technical settings such as classroom, lab or jobsite. The politics are always present, whether verbalized or not.

At MIT, many students and faculty reacted swiftly and vehemently to the school's arrangement to train Iranian nuclear engineers at the Shah's behest, staging voluble demonstrations on campus, letter-writing campaigns, and other forms of protest against the program. Remarkably, our archival research has also revealed that many of the Iranian students already attending MIT

were themselves opposed to MIT's expanding institutional affiliations with AMUT. The stated objections included concerns about nuclear proliferation, targeted concerns about the brutality of the Shah's regime, and principled protest against the school "making direct contracts with a government for the education of professional, technological expertise" [14]. For the Iranian MIT students specifically, their critique was also linked to skepticism regarding AMUT's chancellor Dr. Seyyed Nasr, whose proximity to the Shah was irreconcilable with his notorious critiques of Western paradigms of science.Nevertheless, official enthusiasm for institutional relations between MIT and AMUT generated strategic arguments in answer to the protests. In response to concerns related to supporting an autocratic regime in Iran, we note the rebuttal from MIT's head of Nuclear Engineering at the time, Kent Hansen, quoted in the New York *Times'* coverage of the program:

> "Foreign students who come to MIT rise to become very important people in their society," [Hansen] said. "Since they do become influential, we feel that exposure to MIT is beneficial [15]. "

Referencing analogous US partnerships overseas, then MIT president Jerome Wiesner weighed in with his approval of continuing relations with Iran: "In spite of the present very discouraging situation in the Soviet Union, I think that the effort was worthwhile and I wonder if we don't have an equivalent opportunity to play a constructive or supportive role in Iran" [16].In Hansen and Wiesner's response to the criticisms from progressive engineering students and faculty we see a clear depiction of the presumed neutrality, and sense of moral or intellectual superiority (or both), of elite Western engineering institutions like MIT, all of which discomfited left-leaning members of the MIT community.

Consonant with U.S. opposition to the Vietnam war in the earlier part of the 1970s, it seems likely that those opposing the training of Iranian nuclear experts bristled at the ironic melding of technical experts' claims for objectivity with a disposition of virtue, conveniently paired here to count among consummate "American" characteristics [7], [17]. In the broadest sense, the progressive MIT individual undergraduate students and international students , and faculty members such as Noam Chomsky and Joseph Weizenbaum, believed that technological modernization—enacted through research and teaching in U.S. universities and corporations-must take into account geopolitical threats to global well-being. New understandings of how to be a responsible engineer, and responsible citizen or resident of the United States, can be detected in their protests. Ideas of where the individual might fit into prevailing state ideologies fueled a wide array of social protest movements in the 1960s and for aspiring engineers (and in some cases, their instructors) at MIT, the super-power status of the nation and its imperialist aims required strong critique. This produced a rupture between long-standing conventions regarding engineers' non-partisan civic identity and the political sensibilities of anti-nuclear, pro-Iranian-democracy students.

Historical claims of political neutrality in professional engineering circles were of course strategic, if not actually disingenuous. Since its inception, engineering education in the United States had foregrounded the role of trained engineers in stewarding Western "civilization" (most often meaning by that term aspects of white, American-born and Protestant culture) and

forwarding specific goals such as improved health, prosperity and affluence, a pattern we'll return to below in more depth [17], [18]. By the 1950s, significant numbers of science and engineering professionals had pushed back on the unassailable civic character widely ascribed to engineering, joining rising environmental activism surrounding the publication of Rachel Carson's *Silent Spring*, and then regarding the role of U.S. technoscience in perpetrating war, as in Viet Nam and of course, in the advance of atomic weaponry itself. Unlike the very powerful critiques of U.S. global military operations (including nuclear policies) developed among Black activists of the 1960s and 1970s, including prominent figures such as Martin Luther King, support for Civil Rights arising among (primarily white) Engineering communities rarely took up the question of how technoscientific institutions historically sustained race relations [19], [20]. Nonetheless, reformist movements centered on campuses in this era drew educators and students of many fields into an awareness of ongoing inequities in the supposedly righteous democracy that was twentieth-century America; helping to formulate new possibilities for the participation of engineering in social reform [20] – [25]. In this landscape, the "democratic" rhetoric of MIT leadership, stressing developmentalist, pro-Western, solutionist ideologies, was ripe for challenge. Nuclear technology in any context, let alone in the hands of what many saw as a despotic regime such as Iran under the Shah, was for many observers not redeemable as a feature of an enlightened world society.

Interrogating the role of geopolitics in the teaching and practice of Engineering requires that we understand not only divergent ideological commitments among various stakeholders, but how such commitments have been taken up or suppressed by the arbiters of individual educational and professional success or security in the field. That is: We are eager to explore here not simply how certain members of the engineering community have historically arrived at positions of political resistance or refusal, but how the discipline has reacted; how has Engineering as an identifiable economic sector and epistemic project been changed, if at all, by this activism in different instances? How did the prevailing view of technoscience as servant to U.S. global interests shift, in these moments of disciplinary conflict? This, we stress, is a major step in understanding our own possibilities for social accountability for modern engineering education.

As far as we have been able to ascertain, amid these complex expressions of student and faculty understandings of their disciplines' societal impact in the U.S., expulsions of individuals from engineering programs in the 1960s and 1970s were not the norm. We suggest that such expulsion was not necessary to preserve the overarching political authority of Engineering fields, at both prestigious institutions such as MIT and at the rank-and-file of U.S. engineering schools. Activism at U.S. universities seems to have posed few threats to the maintenance of U.S. geopolitical power and the tenets of racial capitalism that have historically configured both foreign and domestic relations. A major reason for this is that over many decades, a crucial mechanism by which U.S. engineering education settings have grappled with unwanted political sensibilities is through silencing. There is an enduring sense that rigorous, respectable engineering training, as well as engineering in action, from the technical classroom, at the lab bench, or on the factory floor must exclude the subjectivities we know as "politics." This is despite the concession by some that value systems known as "ethics" or "rigor" may (must) be bolstered [26], [27]. Across many technical subdisciplines, so-named ethics and other liability systems are today seen to represent the universe of Engineers' moral responsibilities in its

entirety. We are prompted to ask, then: How precisely does such apparent depoliticization of Engineering curricula sustain itself despite the varied political sensibilities of participants?

The social reproduction accomplished by education under industrial capitalism is too broad a topic for discussion here, but we can start to specify the character of such reproduction in Engineering fields. In the United States, from the profession's nineteenth-century origins in the military context and mechanical training objectives of the Land Grant movement, a good engineer has been formally defined as one who accepts the role of technology in the "empire-self-making" of the United States, as la paperson puts it [28]. In the succeeding generations, the definition of human welfare has continued to pivot in these settings on the notion of American exceptionalism (using the word "American" as an actor's term here, and noting its elision of Canada, and Central and South American polities). The enlightened modernity said to delineate American values from those of retrograde, unscientific cultures requires that the nation bases its global presence on generosity but on no reduction in the sense of America exceptionalism that has led to colonizing projects, enslavement, and war-making domestically and abroad since the nation's founding.

For MIT leftists in the 1970s, to protest nuclear training of Iranian engineers was to counter not just the judgment of MIT's senior faculty, upper administration, donors, funders and board members but also the unassailable futurity and longstanding power of U.S. global relations. To do so was to join a relatively small but highly visible cohort of radical and progressive engineers who very publicly recognized the complicity of engineering in expressions of U.S. technological and hence political/military power [7], [21] – [25]. At Sharif, a distinctly layered and shifting set of political allegiances could be found among engineering students contending with far more unstable national circumstances, dominated by the Shah's autocracy and movements of resistance to it. The possibility of labeling the political ideologies of Iranian engineering students requires greater nuance, perhaps, than we face at MIT in this moment. Many were politically left-leaning; we find a deeply ingrained Marxist political culture amongst Sharif's students, as well as an anti-imperialist ethos. At the same time, their views of engineering and technology more generally might be characterized as orthodox regarding engineering and its relation to modernity, economic development, etc. The students rejected moves to Islamicize or culturize the MIT-affiliated Western engineering curriculum established at Sharif. In some sense, the students involved in it valued and even cherished their affiliation to MIT and its engineering curriculum, while also shoring up some of the most militant resistance to Sharif's leadership and ultimately to the Shah [6]. The Sharif students' reconciliation of technoscientific progress with visions of democratic insurgency reminds us that geopolitical sensibilities among Engineering aspirants cannot be historicized as pro- and anti-technology in any simple way, or schematized identically in all global locations. We are seeing clearly limits on the purported universality of Engineering knowledge.

Highlighting the role of Nationality in Engineering Education: Opportunities and Constraints

Having laid out the prevailing conditions of academic Engineering in relation to radical political sensibilities, we confirm that opportunities for criticality and reflection, and thus disruptive action, in the field of engineering education exist. Consider the fact that both authors are employed in accredited higher-education institutions, working as faculty in/adjacent to university

Engineering programs: in a very basic sense we have been paid by our employers or funders to write this essay and present this paper. What's more, multiple academic disciplines (History, STS, Educational Theory and more) offer us analytic support and receptive audiences for this sort of inquiry. Vitally, progressive and justice-centered projects by engineers are ongoing through the work of individuals and organizations that we mentioned above in both the U.S. and Iran.

At the same time, our scholarship in this subject area is not easily included in the research work of Engineering, per se, in the U.S; this publication would not count towards tenure in any North American engineering department that we know of. Employment conditions aside, to write of politics, activism or past events is not to engage in any familiar way with engineering epistemics. Our own universities confine the acceptable overlap between political inquiry and technical attainment to the narrowest of examples, such as technologists' informational (i.e., uncritical) support of infrastructural-, environmental- or health policy-making efforts. The very idea that such engagements in the U.S. are imagined to constitute *overlaps* in expertise or interdisciplinary initiatives ---rather than projects of political criticality, reform or redistribution -- conserves conventional forms of power associated with capital, governmentality, and military agendas. What hope for disentangling Engineering from its geopolitical legacies, including U.S. global supremacy, given this illegibility, this defanging, of protest?

To answer that question we must ask: What experiences of national belonging have historically allowed for durable resistance and political reform on the part of Engineers? How have geopolitical conditions, including conditions of colonialism and racial capitalism, in nations like Iran shaped engineering students' identities in relation not just to the discipline of Engineering, but to their homelands?

Which leaves us with the question of our own shared community. What would it mean to enact a critical, redistributive, peace-centered identification for members of ASEE? Once we look beyond the ASEE divisions created expressly to engage with political issues such as LEES, the ECSJ, and some others that still together represent only a small minority of ASEE community members, the firewall between technical skill and knowledge and the take-up of geopolitics in the organization stands firm. Can we meaningfully challenge this firewall? Unclear. Certainly James Holly, Jr. and Brooke Coley's radical challenge to ASEE's enduring anti-Blackness in 2022 was both powerful and swiftly assimilated by the organization's leaders [29]. Amid some ongoing address and new concern about growing anti-DEI law-making, discomfort for most listeners in the face of that transgressive naming of racism within the organization seemed to last only briefly. The sustaining relations between Engineering and its patrons and constituents discourage many such confrontations: the primary aim of engineering education activity naturally remains to educate more and more effectual engineers. Prevailing definitions of engineering rigor, pathways to individual and institutional credibility, and metrics of success for Engineering schools such as funding, retention and placement rates all conserve the current social structures and globalizing priorities of the U.S. economy. As in previous periods and across many disciplines, the military, energy-related and other geopolitical choices made by nations are supported by higher education. What affiliations, identifications and sensibilities would a more just institution cultivate in 2024?

The turning away from frank address of global flows of power, politics and harm is not engineering education's omission alone. Higher education in the U.S. is moving in 2024 towards more clearly conciliating rightist interests (such as the recent ouster of presidents at the behest of conservative donors and board members at the University of Pennsylvania and Harvard) and we might ask what that trend will mean for the liberal aspirations of other schools. Where leftist students, faculty, funders and donors will find a place in this context must be our concern.

The writing of activist historians, such as la paperson's *A Third University in Possible,* ask that we question the reformability of existing educational institutions, built as they are on appropriated land, for the concentration of wealth and benefit of majority actors, and with unending colonial and imperial futures in mind [28]. If we are going to keep our own political hopes and commitments at the forefront, including in regard to contemporary conflicts such as U.S. support for Israel's continued assault on Gaza, we should ask how best to make of ASEE a constructive setting in which to articulate and share these aims.

References

[1] Y. Antoniou, M. Assimakopoulos, and K. Chatzis, "The National Identity of Inter-War Greek Engineers: Elitism, Rationalization, Technocracy, and Reactionary Modernism," *History and Technology*, vol. 23, no. 3, pp. 241-261.

[2] T. Saraiva, *Fascist Pigs*. Cambridge, MA: MIT Press, 2016.

[3] L. Camprubi, *Engineers and the Making of the Francoist Regime*. Cambridge, MA: MIT Press, 2014.

[4] G. Dreicer, *American Bridge*. Cambridge, MA: MIT Press, forthcoming.

[5] M. G. Pendás, "Labor Unimagined," *Journal of the Society of Architectural Historians* vol. 11, no. 2, pp. 148-151, June 2022.

[6] S. Vakil, M. Ganjavi, and M. Khanlarzadeh, *Revolutionary Engineers: Learning, Activism, and Politics at Aryamehr University of Technology (1966-1979).* Cambridge, MA: MIT Press, forthcoming.

[7] E. Blue, M. Levine and D. Nieusma, *Engineering and War: Militarism, Ethics, Institutions, Alternatives.* Berlin: Springer, 2013.

[8] J. R. Thelin, *A History of America Higher Education*. Baltimore, MD: Johns Hopkins University Press, 2004.

[9] J.C. Lucena, *Defending the Nation*. Lanham, MD: University Press of America, 2005.

[10] J. Holmwood, “Race and the Neoliberal University: Lessons from the Public University,” in *Decolonizing the University*, G.K. Bhambra, D. Gebrial and K. Nisancioglu, ed., London: Pluto Press, 2018, pp. 37-52.

[11] M. Ganjavi, *Education and the Cultural Cold War in the Middle East*. London, Bloomsbury, 2023.

[12] J. Krige and J. Wang, “Nation, Knowledge, and Imagined Futures: Science, Technology, and Nation-Building, Post-1945,” *History and Technology*, vol. 31, no. 3, pp. 171-179, 2016

[13] U.S. Agency for International Development, “Technical Cooperation with Iran: A Case Study of Opportunities and Policy Implications for the United States” (pamphlet, 1972), quoted in Anonymous Member, Iranian Students Association of M.I.T., “An Iranian Student’s View of Development,” *The Tech*, p. 5, May 9, 1975.

[14] T. Spisak and M. Dortch, “Nuc-Eng Sit-In Held to Protest Iran Deal,” *The Tech*, p. 1, April 29, 1975.

[15] J. Kifner, “Iranian Program Debated and M.I.T,” New York *Times*, p. 16, April 27, 1975. [Online] Available at https://www.nytimes.com/1975/04/27/archives/iranian-program-debated-at-mit-training-of-atom-scientists-called.htmlNytimes.com [Accessed February 7, 2024].

[16] J. Weisner. MIT Archives: Box 90 [Barcode: 39080020389232], HD [HD], MC--0420, Jerome B. Wiesner papers.

[17] M. Wisnioski, *Engineers for Change: Competing Visions of Technology in 1960s America*. Cambridge, MA: MIT Press, 2012.

[18] J. Miller, *Engineering Manhood*. Ann Arbor, MI: Lever Press, 2020.

[19] V. J. Intondi, *African Americans Against the Bomb: Nuclear Weapons, Colonialism, and the Black Freedom Movement*. Palo Alto, CA: Stanford University Press, 2015.

[20] A.E. Slaton, *Race, Rigor and Selectivity in U.S. Engineering: The History of an Occupational Color Line*. Cambridge, MA.: Harvard University Press, 2010.

[21] C. Mody, *The Squares: US Physical and Engineering Scientists in the Long 1970s*. Cambridge, MA: MIT Press, 2022.

[22] P. S. Collopy, “The Revolution will be Videotaped: Making a Technology of Consciousness in the Long 1960s.” PhD. Dissertation, Department of History and Sociology of Science, Philadelphia, PA: University of Pennsylvania, 2015.

[23] R. Slayton, *Arguments that Count: Physics, Computing and Missile Defense, 1949-2012.* Cambridge, MA: MIT Press, 2013.

[24] W. P. McCray, *Making Art Work: How Cold War Engineers and Artists Forged a New Creative Culture*. Cambridge, MA: MIT Press, 2020.

[25] D. Kaiser and W. P. McCray, eds., *Groovy Science*. Princeton: Princeton University Press, 2016.

[26] J. M. Smith, *Extracting Accountability: Engineers and Corporate Responsibility*. Cambridge, MA: MIT Press, 2021.

[27] A.E. Slaton and T. Saraiva, "Editorial," *History and Technology*, v. 39, n. 2, pp. 127-136, 2023.

[28] La paperson, *A Third University is Possible*. Minneapolis, MN: University of Minnesota Press, 2017.

[29] J. Holly, Jr. and B. Coley, "Engineering Independence" June 14, 2022. [Online]. Available at https://www.engineeringindependence.com [Accessed February 8, 2023].