Neuroqueers in Engineering: Investigation of Engineering Education that serves those in Neurodivergent and LGBTQIA+ Communities

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Abstract

The intersection of neurodivergent and LGBTQIA+ identities, referred to as "neuroqueer" in this work, is an emerging field of study within engineering programs at North American universities. The broader impact of this research is to find how to best support students with this intersectional identity in the context of engineering education. The intent is to determine what efforts have been made thus far in how neuroqueer students can be better served by their engineering schools, and where these programs currently fall short. Throughout the literature search process, it has been shown that individuals who are a part of underrepresented and/or marginalized communities face intersectional prejudices and experience more stress than those without marginalized identities. Making changes to learning environments that would benefit these students, would also be beneficial to students who do not hold these identities as well as those who are not yet identified to be a part of these communities. Determining how one specific group of students can be supported in a way that helps them to be more successful will help other groups of students and will make these programs better as a whole. The systematic literature search conducted on this topic is presented to illustrate where the current state of research is in engineering education that serves LGBTQIA+ and neurodivergent communities. The final results of this research are key determinations of gaps within current research efforts to chart paths forward for new research to serve neuroqueer students. Future ideas for the continuation for this research include designing pedagogy for engineering instructors and developing recommendations for how instructors can better support neuroqueer students.

Keywords: neurodivergent, LGBTQIA+, neuroqueer, literature review

1. Introduction

This work investigates engineering education efforts that address students within the neurodivergent and LGBTQIA+ communities. The intersection of these two identities is referred to as "neuroqueer" in this work. This research is specifically meant to find how to best support students with this intersectional identity in the context of engineering education.

The introduction includes a subsection with definitions of main terms used within this paper before presenting the Motivation and Research Questions for this work.

1.1 Terminology

This subsection provides a brief overview of terminology regarding neurodivergent and LGBTQIA+ topics.

Neurodivergent refers to all neurotypes outside of the typical. We define neurotypical as those whose brain functions in a way that society expects or that the majority orient themselves to. Thus, neurodivergent is all those outside the neurotypical. In current media, neurodivergent

typically only refers to Attention-Deficit/Hyperactivity Disorder (ADHD) and/or Autism Spectrum Disorder (ASD). However, the term neurodivergent actually encompasses numerous neurotypes including but not limited to: ADHD, ASD, Tourette Syndrome, dyslexia, dyscalculia, depression, Obsessive Compulsive Disorder (OCD), and anxiety disorders. The literature discussed in this paper generally refers to neurodivergent in a similar way to popular media. While this paper intends to encompass a much broader understanding of neurodivergent identities, the vast majority of papers found in this literature search only referenced a few neurodivergent identities at a time and were not broadly inclusive of the entire neurodivergent community.

In the LGBTQIA+ community, the acronym stands for Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, Intersex, and Asexual/Agender/Aromantic. The "+" is included to represent the many other identities within this community, including but not limited to: two-spirit, nonbinary, pansexual, and genderfluid.

1.2 Motivation

The challenges faced by neurodivergent people (ableism, lack of support in meeting needs, accessibility challenges, etc.) and the challenges faced by LGBTQIA+ people (homophobia, transphobia, compulsory heterosexuality, etc.) are all faced by neuroqueer individuals; by virtue of their intersectional sociopolitical identity, neuroqueer people experience the cumulative effects of these challenges [1]. Academia was not designed for neurodivergent nor LGBTQIA+ people's needs, which begs the question of what systemic changes need to be made to best support these students.

Throughout the literature search process, it has been shown that individuals who are a part of underrepresented and/or marginalized communities face intersectional prejudices and experience more stress than those without marginalized identities. Making changes to learning environments that would benefit these students would also be beneficial to students who do not hold these identities as well as those who are not yet identified to be a part of these communities. Determining how one specific group of students can be supported in a way that helps them to be more successful will help other groups of students and will make these programs better as a whole.

The motivation for this paper is to establish the state of the literature on neuroqueer students in engineering. The initial objective of this project was to do an overview of the current literature on neuroqueer engineering students, but one of the core findings of this literature review was an absence of research on this demographic. The most relevant paper found discussed neuroqueer physics students, and was a discussion of neuroqueer theories, and not a quantitative study [2]. No papers were found that specifically discussed neuroqueer engineering students.

This is an emerging field of study, shown by the number of the papers published in early 2024 alone (about 22%). The intent of this research is to determine what efforts have been made thus far in how neuroqueer students can be better served by their engineering schools, and where these programs currently fall short.

1.3 Research Questions

Given the presented motivation, the broad impact of this research will focus on the following questions:

- What is the current state of the research into neuroqueer students in undergraduate engineering programs?
- What are the current barriers/challenges that neuroqueer students face in their engineering programs?
- How is the intersectional identity of being neurodivergent and LGBTQIA+ unique in engineering spaces?
- How can neuroqueer students be best supported by their engineering programs?

This paper outlines the results of a literature review that tackles the first of the Research Questions. The future of the research will be driven by the latter three questions.

2. Methods

A systematic literature review was conducted to determine the current state of research in the fields of engineering, neurodivergence, and LGBTQIA+. This section outlines the search methods used to find the literature and categorize the findings.

The literature review was conducted through use of various terms to identify the LGBTQIA+ population. These include “LGBT”, “LGBTQ”, “LGBTQ+”, “LGBTQIA+”, and “Queer”. Each search using the variations of the acronym yielded different results, and a trend was found in length of the acronym and the age of the paper; newer papers appeared to use the longer acronym and started using the word “Queer” in the titles of papers. This potentially follows increasing social awareness of more identities under this umbrella. The increase of the usage of “Queer” likely follows the trend of reclaiming this word and is being used as opposed to the increasing length of the acronym, particularly by younger members of the community.

As previously stated in this paper, neurodivergent is defined as all neurotypes outside of the typical. However, in many contexts within the literature, it usually only refers to autism and ADHD. As these were of primary interest to the research, the initial searches included search terms including but not limited to Autism, ADHD, and neurodivergent. Some of the sources that were studied explored a wide range of identities (for example [3]), while others explored only one or two identities. Future research may further explore additional neurodivergent identities within the engineering context such as dyslexia, dyspraxia, dyscalculia, obsessive compulsive disorder, various anxiety disorders, auditory processing disorder, etc.

The literature search was done predominantly via Google Scholar, but also included the ASEE Peer database, university database searches, Google searches, and recommended related papers or citations on the papers’ host sites. Additionally, papers in the body of work of prolific authors in the field were a large source of new information. On Google Scholar there were several different methodologies that were used in the searches. An identity category was used (these included “neurodivergent”, “autism”, “ADHD”, “LGBT”, “LGBTQ”, “LGBTQ+”,

"LGBTQIA+", "Queer") with one field category (these included "Engineering", "Science", and "STEM"). "Engineering" vs "STEM" vs "Science" yielded surprisingly different results. "Engineering" gave results that were generally from engineering programs or engineering professionals. "STEM" gave results that were not always as broad, and seemed to use STEM to help the paper gain a larger audience.

All of the papers included in this search were published between 2009 and 2024, with the majority being from 2020 or later, with the average year of publication being 2020, and the median year of publication being 2024.

This research took place in three different locations (two different universities in different states, and one of the author's home networks without a university VPN). It was noticed that different search results came up, particularly at the different universities even when the same, or similar searches were used. The research that took place at the second university allowed for the discovery of the work of one of the two prolific authors in this field, which will be addressed in the Results section.

3. Results

In total, over 120 articles were found during the systematic literature review. The general breakdown of the papers by topic are presented in Table 1 below. The table is organized by three key categories: Field of study, Focus Area of research, and Academic Level of participants.

Table 1: Breakdown of Papers Categorized by Field of Study, Focus Area of Research, and Academic Level of Participants (N=120)

Category	Term	Occurrences	Percent of Total
Field	Engineering	50	42%
	STEM	35	29%
	Science	24	20%
Focus Area	LGBTQIA+	59	49%
	Neurodivergent	47	39%
	Gender	13	11%
	Race	5	4%
Academic Level	Professional	22	18%
	Graduate	7	6%
	Undergraduate	45	38%

Note that some papers had multiple categories and may be represented in several instances of the table. For example, several papers addressed LGBTQIA+ and gender topics.

Papers in the engineering category are specifically about engineering students or professionals and may or may not include another field (such as sciences). STEM papers included STEM in their titles or abstracts and focused on several fields within STEM. Papers with STEM and Engineering as focus areas were categorized as engineering because adding STEM to the title is

often used to increase traffic on the paper. Papers categorized as science were only focused on science fields, and did not include engineering majors. Approximately 20% of the papers found were specific to only science fields, and did not include engineering. Approximately 30% were more broadly about STEM. The remaining ~50% of papers were focused on engineering or multiple fields.

Papers were also categorized by focus area: LGBTQIA+, neurodivergent, gender, race or other (including but not limited to social justice, mental health, disability, etc.). This research specifically focuses on LGBTQIA+ and neurodivergent students in engineering, with some exceptions for papers that had other relevant material (such as [2]). When searching for papers that explore the intersectional identity of being both neurodivergent and LGBTQIA+, there has been surprisingly very little published research on the subject, particularly regarding higher education, STEM, or specifically engineering programs. There were only two notable papers about neuroqueer students [2], [4].

As seen in Table 1, of the 120 sources found, there were 50 that specifically focused, part or in whole, on Engineering. As engineering education is the main focus of this research, only those papers are included in the full table of results that can be found in the Appendix.

3.1 LGBTQIA+ Search Results

The variations of abbreviations for LGBTQIA+ brought different results and different ages of papers. Older papers almost always used “LGBT” and newer papers often used “LGBTQIA+”. Using “science” instead of “engineering” or “STEM” all yielded different results and brought in a different pool of research. It is likely that the number of papers in this field has increased since the submission of this paper in that regard. As the search expanded, keywords found in other papers were used to find new information in the terms used in the current literature.

There were significantly more papers found about neurodivergent students in just the sciences than in engineering fields, but fewer about LGBTQIA+ students in the sciences than in engineering fields. Future research would need to investigate the reason or cause behind this observation, such as the potential for flexibility stigmas in engineering or the availability of research subjects in the fields.

Many papers did not include transgender and gender-nonconforming (TGNC) individuals (such as [5] [6] [7]). These papers were published in 2009, 2011, and 2017 for sociopolitical context, and only researched sexuality. Only two papers focused on TGNC in engineering or STEM exclusively [8] [9].

3.2 Neurodivergent Search Results

A significant portion of the sources found specifically about neurodivergent students (~20%) was published in the year that the literature search was conducted (2024). The exact search terms used had a significant impact on the papers found; much of the research occurred using current identity terms that are not commonly used in academic papers, where more outdated and more medicalized terms appear to be more common. For example, many papers were found using

“Autism Spectrum Disorder” or “ASD” as opposed to just “Autism” and “Attention Deficit Disorder” or “ADD” yielded different results than “ADHD”.

“Obsessive compulsive disorder” or “OCD” also yielded different results than searching for “neurodivergent”, likely due to it often not being considered a neurodiverse condition. “Anxiety disorders” yielded results about class stresses as opposed to students who have long term mental health struggles.

Comparing the literature regarding different identities and neurodevelopmental conditions shows a distinct difference in the language used to discuss them. Papers that studied autistic students tended to infantilize the students they were talking about, frequently utilized deficit-based strategies (such as treating the students like misbehaving children when discussing adult college students), and in several instances used parental input as opposed to speaking with the students directly (implying the students weren’t capable of providing the input themselves). [Note: The citation numbers are not included here to prevent call-out culture.] Research about ADHD had a stronger focus on GPA, and the language used gave the impression that the students, while intelligent, were not reaching high academic potential due to their ADHD.

It was also observed that there was a lack of research about other neurodevelopmental conditions and others that fall under the neurodivergent umbrella (Ex: dyslexia, dyspraxia, dyscalculia, OCD, etc.). Many of the searches yielded papers specifically about ADHD and Autism; though after completing searches including these terms, it is unclear if there is a large gap in the literature or if there was an underlying research bias that affected the categories of papers found. There is some evidence to support a lack of research on neurodivergence and students with disabilities (only two sources found in these categories).

Throughout this literature search, two prolific authors were found in this field of study: Cech and McDermott. Much of Cech’s body of work was included in this paper, as much of it was relevant to the research. Cech’s research focuses on various marginalized identities usually within STEM or higher education. McDermott authored the only paper found that discussed neuroqueer students in a STEM field (physics). Refer to the Reference section for the body of work by each author.

3.3 Limitations

Full text availability affected which papers were included in this study; as with such a large number of papers found throughout the initial review, papers that did not have full text availability from the authors’ university were not included in this paper. It was determined that the focus of the research would be on sources that were readily and widely available in order to speak towards the accessibility of the research. Future work will determine how many papers were excluded from this work, what they focused on, and why they were not accessible.

Several of the papers used data from the same engineering education survey of 1,729 students from the ASEE Diversity and Inclusion Survey in 2015 [10]. This could be significant because it means that the implications of this singular study, and its potential statistical uncertainties, would carry over to the other papers that used data from this survey. However, it cannot be overlooked

that there is utility to have numerous researchers use the same data set to pull different results and projects from in the name of advancing engineering education for underrepresented minorities and other communities.

4. Conclusions

This review focused on determining the current state of research in engineering education related to the neurodivergent and LGBTQIA+ communities. Out of the 120 articles found using a systematic literature survey, 50 articles were published on engineering and one of the focus areas within those two communities. This research outlines the general trends of the published articles in order to determine deficiencies in these areas. The appendix provides details on the 50 articles on engineering education in these categories.

This literature search displayed the gaps in current research regarding neuroqueer identities in Engineering. Conducting quality research on neurodivergent communities is challenging due to systemic problems in diagnostics including lack of access, gender and racial biases, etc. Current systems are not built for neuroqueer students. Challenges faced by LGBTQIA+ students in Engineering and STEM fields include feeling pressured to come out in certain contexts, being misgendered, fear of discrimination, feeling the need to mask parts of personality to be accepted, and lack of role models [11]. Challenges faced by neurodivergent students in Engineering and STEM fields include masking neurodivergent traits to fit in, struggling to fit into neurotypical norms, not receiving proper accommodations, and feeling the need to work harder than neurotypical peers [2].

There is a significant pool of research on each of the individual identities that were evaluated, however, one of the main findings of this systematic literature search has been the discovery of minimal research on the intersection of neurodivergent and LGBTQIA+ communities. Only one paper found in the literature search discussed neuroqueer students in a STEM field [2]. Some articles used deficit-based language when talking about neurodivergent people and disabled communities. There are few that discuss neuroqueer identities in academic contexts, let alone in STEM.

The results of this systematic literature review will provide the foundation for future work in the area of engineering education that mitigates challenges faced by neurodivergent and LGBTQIA+ populations.

5. Future steps

While this research addressed the first of four Research Questions, the remaining three need to be investigated:

- What are the current barriers/challenges that neuroqueer students face in their engineering programs?
- How is the intersectional identity of being neurodivergent and LGBTQIA+ unique in engineering spaces?
- How can neuroqueer students be best supported by their engineering programs?

IRB approval will be sought for interview-based research on student experiences to begin the process of quantifying the needed supports for neuroqueer engineering students. This will provide a foundation for developing pedagogy for teaching faculty in engineering. Future work will determine at what level the pedagogy could be most effective, such as introductory freshmen engineering classes versus senior design level classes.

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Appendix: All Engineering Education Sources found within the Established Focus Areas

Title	Field	Focus Area(s)	Main Points	Academic Level	Pub. Year	Number of Participants/ Papers	Citation
Professional Role Confidence and Gendered Persistence in Engineering	Engineering	Gender	The results of professional confidence from all categories were very split across gender	Professional	2011	228	[12]
Ideological Wage Inequalities; The Technical/Social Dualism and the Gender Wage Gap in Engineering Gender Inequality	Engineering	Gender	The gender wage gap in Mech. Engr. and Elect. Engr. is ~16% (much higher than in other engineering fields)	Professional	2013	9,936	[13]
Engineers and Engineeresses? Self-conceptions and the Development of Gendered Professional Identities	Engineering	Gender	The results on self-conceptions and professional identities were very split across gender and race	Professional	2015	312	[14]
“I am Not a Feminist, but. . .”: Hegemony of a Meritocratic Ideology and the Limits of Critique Among Women in Engineering	Engineering	Gender	Women in engineering see DEIA work/involvement as a challenge to their quality of engineering	Undergraduate	2018	41	[15]
“Engineers Who Happen to be Gay”: Lesbian, Gay, and Bisexual Students’ Experiences in Engineering	Engineering	LGBTQIA+	Homophobic/sexist sentiments in engineering, LGB students often mask parts of their identities to fit in. LGB students are often isolated due to these sentiments	Undergraduate and Graduate	2009	17	[6]

Navigating the heteronormativity of engineering: the experiences of lesbian, gay, and bisexual students	Engineering	LGBTQIA+	Journal continuation of conference paper “Engineers Who Happen to be Gay” [6]	Undergraduate and Graduate	2011	17	[7]
The Veiling of Queerness: Depoliticization and the Experiences of LGBT Engineers	Engineering	LGBTQIA+	The depoliticization of engineering creates stigma around conversations about LGBT people and identity	Professional	2013	15	[16]
ASEE Safe Zone Workshops and Virtual Community of Practice to Promote LGBTQ Equality in Engineering	Engineering	LGBTQIA+	SafeZone makes people aware of what current issues are	Undergraduate and Professional	2016	270	[17]
The Inequality of LGBTQ Students in U.S. Engineering Education: Report on a Study of Eight Engineering Programs	Engineering	LGBTQIA+	LGBTQ students in engineering are more likely to be marginalize, less likely to have their work respected; these results were consistent across programs even though the programs were different	Undergraduate	2017	1729	[18]
The Complexity of Nonbinary Gender Inclusion in Engineering Culture	Engineering	LGBTQIA+	Gender equity in engineering is important for women, but also nonbinary and gender nonconforming students.	All	2018	N/A	[9]
Transformational Resistance and Identity Development: A Case Study of an Asexual Woman Engineer	Engineering	LGBTQIA+	Transformational resistance happens at lots of milestones in professional identity development, noticed or not.	Undergraduate	2022	1	[19]
Understanding the Workplace Transition Experiences of	Engineering	LGBTQIA+	There is a lack of research about the transition to the workplace for queer	Undergraduate	2024	55	[20]

Undergraduate Queer Engineering Students			engineering students which limits further action.				
Queer Ties: A Work in Progress LGBTQ+ Graduate Student Mentorship Program	Engineering	LGBTQIA+	Providing queer graduate students with opportunities for connection and mentorship allows for positive representation and community.	Graduate	2024	12	[21]
"Tricks of the Trade": Sharing the Experiences of Queer and Trans Graduate Students	Engineering	LGBTQIA+	Departments do not do enough to support LGBTQ grad students.	Graduate and Professional	2024	12	[22]
Queer Lights: Combining Technology, LGBTQA, and Diversity Topics in an Accessible and Inclusive Learning Environment	Engineering	LGBTQIA+	Creating a class that focuses on both electrical engineering and queer studies worked	Undergraduate	2018	2 classes	[23]
Queering Engineering: A Critical Analysis of the Gender/Social Dualism in Engineering and Engineering Education Research	Engineering	LGBTQIA+	This paper shows differences in how technical/social dualism is utilized in research about norms in engineering culture.	Undergraduate	2016	237 papers found	[24]
Engineering Allies: The Personalities of Cisgender Engineering Students	Engineering	LGBTQIA+	Cisgender students felt more accepted in engineering. Students who chose to note that they were cisgender were more open	Undergraduate	2017	2,697	[25]
Exploring Transgender and Gender Nonconforming Engineering	Engineering	LGBTQIA+	TGNC engineering students separate their gender and engineering identities in order to feel supported in	Undergraduate	2019	2	[9]

Undergraduate Experiences through Autoethnography			engineering spaces. To better support TGNC engineering students, inclusion is necessary				
Affirming Policies, Programs, and Supportive Services: Using an Organizational Perspective to Understand LGBTQ+ College Student Success	Engineering	LGBTQIA+	LGBTQIA+ student clubs and resource centers are extremely important in actually supporting queer students	Undergraduate	2016	N/A	[26]
Half as Likely: The Underrepresentation of LGBTQ+ Students in Engineering	Engineering	LGBTQIA+	Negative climate has a large impact on LGBTQ+ engineering students.	Undergraduate	2018	8253	[27]
Experiences of LGBTQ+ graduate students in research-focused doctoral programs: a scoping review	Engineering	LGBTQIA+	Visibility, acceptance, understanding, and educating are all steps that can be taken to best support LGBTQ+ grad students.	Graduate	2024	82 papers (3 focused on STEM)	[28]
Queer identities in materials science and engineering	Engineering	LGBTQIA+	DEI statements have a positive impact on queer people in academic organizations. Acceptance and visibility also matter, particularly on an interpersonal level	All	2018	N/A	[29]
Exploring Inclusive Spaces for LGBTQ Engineering Students	Engineering	LGBTQIA+	Visibility of queer adults on campus is important and integrating social topics and impact into engineering matters. Talking about	Undergraduate	2018	8	[30]

			inclusivity in academic spaces is important.				
“Managing by Not Managing”: How Gay Engineering Students Manage Sexual Orientation Identity	Engineering	LGBTQIA+	The climate was felt as silent/neutral, the separation of technical and social in engineering, and compartmentalizing their identity as opposed to integrating their whole self	Undergraduate and Graduate	2017	7	[5]
Engineering deans' support for LGBTQ inclusion	Engineering	LGBTQIA+	Many deans generally supported initiatives to support queer students but were not ready or willing to commit resources to them for various reasons	Professional	2016	47	[31]
Perceptions of the Engineering Curricula from Women and LGBTQIA+ Students	Engineering	LGBTQIA+ and gender	Women and queer students are less comfortable with talking in class, classroom policies and feel less represented by class content.	Undergraduate	2022	205	[32]
The Island of Other: Making space for embodiment of difference in engineering	Engineering	LGBTQIA+, disability, gender, race	Combining disability pedagogy and queer pedagogy is important for universal design in engineering	Undergraduate	2013	N/A	[33]
Neurodivergent Student Characteristics and Engineering Course Outcomes	Engineering	Neurodivergent	Some types of class assignments are more difficult for certain neurodivergences	Undergraduate	2024	50	[34]
Tinkering with Technology: How Experiential Engineering Ethics Pedagogy Can Accommodate Neurodivergent	Engineering	Neurodivergent	Neurodivergent students benefit from hands-on learning	Undergraduate	2024	24-105	[35]

Students and Expose Ableist Assumptions							
Autism spectrum disorder and engineering education - needs and considerations	Engineering	Neurodivergent	One big challenge for autistic engineering students may be various aspects of social interaction, and emphasize the importance of inclusion.	Undergraduate	2016	N/A	[36]
Supporting Students with an Autism Spectrum Disorder in Engineering: K-12 and Beyond	Engineering	Neurodivergent	Specific examples given for how to best support autistic students in engineering including universal design, meeting people where they're at, giving opportunities to apply knowledge, etc	K-12	2021	N/A	[37]
Where Resources End and Teaching Begins: Experience with Students with Autism Spectrum Disorders in the Freshman Engineering Curriculum	Engineering	Neurodivergent	Author's opinion on how professors could support autistic freshman engineering students.	Undergraduate	2017	N/A	[38]
Divergent thinking and academic performance of students with attention deficit hyperactivity disorder characteristics in engineering	Engineering	Neurodivergent	ADHD characteristics can have a negative impact on GPA but often have a positive impact on the ability of divergent thinking.	Undergraduate	2020	60	[39]
Unique Potential and Challenges of Students with ADHD in Engineering Programs	Engineering	Neurodivergent	Many engineering students with ADHD are very creative, though some ADHD characteristics had a negative GPA impact.	Undergraduate	2016	55	[40]
Exploring the Creativity Potential of	Engineering	Neurodivergent	Journal continuation of paper immediately above.	Undergraduate	2017	54	[41]

ADHD Students in Engineering Programs							
Challenges, Strengths, and Strategies of Software Engineers with ADHD	Engineering	Neurodivergent	Recommendations: neurodiversity awareness, "agile team practices", alternate promotional paths, workplace flexibility options	Professional	2024	19	[42]
The interplay of ADHD characteristics and executive functioning with the GPA and divergent thinking of engineering students: A conceptual replication and extension	Engineering	Neurodivergent	Engineering students who struggle with executive functioning often have great strengths in divergent thinking	Undergraduate	2022	199	[43]
Examination of Ableist Educational Systems and Structures that Limit Access to Engineering Education through Narratives	Engineering	Neurodivergent and disability	Inclusion and utilizing disability theory (as opposed to ableist ideals) are ways engineering can better support neurodivergent and disabled students	Undergraduate	2022	2	[44]
Engineering ableism: The exclusion and devaluation of engineering students and professionals with physical disabilities and chronic and mental illness	Engineering	Neurodivergent, Disability	Disabled students and professional engineers are less likely to be respected by peers/coworkers and consider leaving programs/jobs	Undergraduate and professional	2023	1729 students, 8321 professionals	[45]
The (Mis)Framing of Social Justice: Why Ideologies of Depoliticization and Meritocracy Hinder Engineers' Ability to	Engineering	Other (Social Justice)	The idea that engineering is apolitical leads to stigma around social justice in engineering spaces	Professional	2013	N/A	[46]

Think About Social Injustices							
Transgender Inclusive and Affirming Design in Computing	Engineering (Computing)	LGBTQIA+	They recommend sites be very mindful of what information they are asking for, and when they do to make options inclusive. Additionally, making it easy to change screen names/pronouns	N/A	2023	N/A	[47]
Lesbian, gay, bisexual, and transgender students in engineering: Climate and perceptions	Engineering (Computing)	LGBTQIA+	Queer engineering students struggle with the heteronormativity in engineering, how engineering majors are often left out of the broader LGBTQIA+ campus community, exclusion within engineering	Undergraduate	2013	16	[48]
Lesbian, Gay, Bisexual, Transgender, and Queer Students' Sense of Belonging in Computing: An Intersectional Approach	Engineering (Computing)	LGBTQIA+	Queer students are more likely to consider leaving their major. Queer women are more likely to consider leaving their major than queer men or non-queer women	Undergraduate and Graduate	2016	857-899	[49]
Inclusion in Materials Science and Engineering: Why Diversity is Necessary and How to Achieve Better Outcomes Together	Engineering & Materials Science	Neurodivergent	Author talks about experiences being LGBTQ+ and neurodivergent, call for increase in diversity in material science and engineering	N/A	2023	N/A	[50]
Queer and Engineer? Exploring Science and Engineering Identity	Engineering and Science	LGBTQIA+	Queer students are more likely to leave engineering and science to look for more supportive majors	Undergraduate	2024	548	[51]

Among LGBTQ People							
Consequences of Flexibility Stigma Among Academic Scientists and Engineers	Engineering and Science	Other	Flexibility stigma effects everyone, has negative impacts on the departments that foster flexibility stigma	Professional	2014	266	[52]
A Review of the State of LGBTQIA+ Student Research in STEM and Engineering Education	Engineering and STEM	LGBTQIA+	Much of the current research on LGBTQIA+ engineering students is about the climate of Engr ed, identity dev, queer theory is not applied	All	2020	N/A	[53]
Dignity and well-being: Narratives of modifying the culture of engineering education to improve mental health among underrepresented STEM students	Engineering and STEM	LGBTQIA+ and Neurodivergent	The main struggles of underrepresented students in engineering were not feeling like they belonged, the stress culture of engineering, fears of failure, and various forms of burn out.	Undergraduate	2023	3	[54]
Neuroqueer Literacies in a Physics Context	Science (physics)	LGBTQIA+ and Neurodivergent	There are some accommodations and classroom changes that would greatly improve experiences of neruoqueer students.	Undergraduate	2023	N/A	[2]
Experiences of neurodivergent students in graduate STEM programs	STEM	Neurodivergent	Burnout, masking, people pleasing, power dynamics, etc. are reasons that neurodivergent grad students were struggling.	Graduate	2023	18	[3]