International Journal of Multidisciplinary Research and Growth Evaluation.

A Qualitative Study of Impostor Phenomenon on Female Engineering Graduates' Experiences from Pamantasan ng Cabuyao

Hannah Glenn P Boncayao [1*], **Lorie Nell D Dioneda** [2], **Clejie Nicole B Fedoc** [3], **Candy C Lozada** [4], **Rielle P Quibilan** [5], **Roy Kenneth Y Lazaro** [6]

[1-5] College of Arts and Sciences, City of Cabuyao, Laguna, Philippines
[6] CHRA, College of Arts and Sciences, City of Cabuyao, Laguna, Philippines

* Corresponding Author: **Hannah Glenn P Boncayao**

Article Info

Abstract
This qualitative study explored the lived experiences of female engineering graduates from Pamantasan ng Cabuyao, focusing on the presence and impact of the impostor phenomenon (IP). Eight graduates presented varying levels of IP as measured by the Clance Impostor Phenomenon Scale participated in semi-structured interviews. Interpretative Phenomenological Analysis revealed several key themes: self-doubt regarding skills and qualifications, workplace challenges including perceived skill inadequacy and overwhelming tasks, fear of failure coupled with a drive for self-development, the impact of self-expectations on well-being and productivity, navigating the pressure of challenging roles, challenges with self-perception and opportunity-seeking, coping mechanisms including perfectionism and seeking external validation, managing self-doubt through self-awareness and support systems, and the importance of support systems in mitigating IP. Findings indicated that early career stages are marked by significant uncertainties and self-doubt, often masked by overcompensation and a reluctance to acknowledge achievements. Participants demonstrated a tendency to internalize negative feedback while also leveraging it for growth. Strong support systems, both personal and professional, emerged as crucial in combatting IP and fostering self-efficacy. The study highlights the need for further research, particularly within the Filipino context, to explore potential culture-specific manifestations of the impostor phenomenon.

1. Introduction
Research on the impostor phenomenon began in the late 1970s with Clance and Imes' seminal work and since then had an enduring relevance in the field of psychology, which is why, almost 50 years since the term was coined, the researchers aim to conduct a study on the impostor phenomenon with Pamantasan ng Cabuyao's female engineering graduates. With the rise of globalization, research has also been made more accessible, inclusive, and diverse. However, there is a limited amount of research on the impostor phenomenon by Filipinos, for Filipinos, and with Filipino participants. Therefore, this study aimed to contribute meaningfully to the local studies of this topic.
Jamison (2023) [11] shared Doctor Clance's experience as an assistant professor at Oberlin College, where some of her students' confessed fears of impostorism similar to her own. She also wrote about this experience on her website, sharing a particular sentence about feeling like an impostor amongst the sea of bright people. Lambert (2023) [13] related the history of the impostor phenomenon: In 1973, she teamed up with Doctor Suzanne Imes and published their work where they coined the term impostor phenomenon. Jamison (2023) [11] shared how the pair conducted their study: They conversed with over 150 successful women in the span of 5 years, including students and faculty members at several universities and professionals in law, nursing, and social work.

They found that the women in their sample lived in unending fear that they would be discovered as intellectual impostors by someone more significant than them. Furthermore, Clance and Imes defined the phenomenon in their study as the experience of those who internally feel undeserving of their achievements or like frauds.

Just as an impostor has many faces, the impostor phenomenon also has different names that are used interchangeably across many studies. Bravata, Watts, Keefer, Madhusudhan, Divya, Taylor, Clark, Nelson, Cokley, and Hagg (2019) [1] listed other synonyms for impostor phenomenon such as fraud syndrome, impostor syndrome, perceived fraudulence, interpersonal guilt, and impostor experience. However, this term can be quite misleading, as it is a phenomenon rather than a syndrome, as described by the two who coined it and supported by Gatchpazian and Davis (2024) [9] in their article.

As the impostor phenomenon involves mixed feelings regarding one's place, it can cause self-doubt. It can also worsen an individual's mental health, as was further expounded in the article by Raypole (2021) [16] that these types of existing mental health symptoms can produce or even induce further emotional distress due to feelings of inadequacy, which can propagate feelings of anxiety and depression. The symptoms mentioned above may even feed into one's psyche, causing self-doubt, less self-confidence, and negative assumptions regarding one's surroundings. This cycles into feeding the symptoms of their feelings of being a fraud, which causes the impostor phenomenon and cycles back to their mental health regarding their anxiety, depression, and repeating on and on. Additionally, the study by Levant, Nguyen, Villwock, and Manzardo (2023) [14] fortified this information that the impostor phenomenon negatively impacted one's health and contributed to stress and burnout.

The impostor phenomenon is quite common as the study conducted by Bravata *et al*. (2019) [1] discovered that up to 82% of people have faced feelings of impostor phenomenon, a struggle with the sense that they have not earned what they have achieved and are frauds. In an article for The Independent, Lewis (2023) [15] revealed the statistics of the impostor phenomenon from a study conducted with 4,000 participants where 53% of interviewed women had felt irrational self-doubt regarding their competence and qualifications. Said study further detailed the participants' feelings, where women tended to feel like frauds within their workplace, in places of learning, and with friends, coming in at 72%, 29%, and 29%, respectively. Even though it is a relatively common phenomenon, as was previously discussed, it is concerning how such a common phenomenon can easily affect one's health, which could be more harmful to an already sickly individual and can lead to more complications, as were the results from a study by Clark *et al*. (2021) [6] where they had discovered that as the professionals' impostor phenomenon became evident; the lower their compassion levels became, and the higher the rate of burnout turned out.

The Institution of Engineering and Technology (2024) revealed that over 1 million women are in STEM occupations, yet they only account for up to 29% of the workforce. Fry, Kennedy, and Funk (2021) [8] revealed that only 22% of engineering and 19% of computer science degree holders are women. As reported in the article created by STEM Women (2023), 61% of recent STEM graduates

have identified with the concept of the impostor phenomenon, a 4% increase from the year before. Chakraverty (2021) [4] stated in one of her many studies of the impostor phenomenon that it affects qualified professionals in STEM. Her eleven participants—PhD students, postdoctoral scholars, and faculty—experienced the 'high to intense impostor phenomenon.' They cite their field of research, engineering education research, feeling as though existing in a separate world from engineering, their identities as scholars, and gendered experiences (as the participants were predominantly white women) as their reasons for feeling like outsiders.

According to a local article by Cahiles-Magkilat (2023) [3] in the Manila Bulletin, the Philippines has the widest gender gap in STEM in the Asia-Pacific region, with women making up just 36%. Considering this, how present is the impostor phenomenon among those in the STEM field in the Philippines? Cabuen, Dela Cruz, Figueroa, Mayores, and Regudon (2021) [2] of the National University conducted a qualitative study with scholars in Metro Manila universities who were K-12 graduates who became college students. They found in their research that these scholars experienced impostorism, and the themes that emerged–most notably feelings of inadequacy, burnout, the attribution of achievements to external factors, and feelings of uncertainty–were all consistent with the experiences associated with the impostor phenomenon.

Due to its recent reemergence in the public consciousness, studying the impostor phenomenon and making plans for intervention is relevant in today's society. With this background, the researchers explored the impostor phenomenon (IP) among female engineering graduates' experiences. In order to determine the presence of the impostor phenomenon experienced by the respondents, the effects of IP on certain commonalities that would manifest in their data would be illustrated through methods that will effectively convey the presence of IP. The study aimed to explore how female engineering graduates perceive their experiences, examining how these processes may influence feelings of the impostor phenomenon.

2. Methodology
A. Research Design
The study utilized a qualitative design. Ugwu and Eze (2023) [20] stated that qualitative research explores feelings, concepts, and experiences. With data usually gathered in narrative form, its main goal is to demonstrate thoughts that might generate testable hypotheses.

Moreover, this study employed a phenomenological research design to investigate the perspectives of the participants who have experienced the impostor phenomenon to grasp its universal nature better. As discussed by Delmas and Giles (2022) [7], phenomenological study is a research method that focuses on investigating human experiences, particularly how individuals perceive and interpret their lived and shared experiences.

This study incorporated thematic analysis (TA) and interpretative phenomenological analysis (IPA) to delve deeper into the information that revealed the underlying reasons for female engineering graduates' experiences regarding impostor phenomenon. Thematic analysis, as defined by Jnanathapaswi (2021) [12] is used to identify patterns and create themes by analyzing a wide range of data sets. It enabled the precise determination of the relationship

between concepts and the frequency at which they arise in the overall content of the data. Interpretative phenomenological analysis (IPA), as cited by Robinson and Williams (2024) [17] from Smith, Flowers, and Larkin's book entitled Interpretative Phenomenological Analysis in 2009, IPA does not simply aim to provide a direct description of the experience. Instead, it centers on the researcher's knowledge of the participant's perspective on their experience. IPA investigates the nature of participants' experiences and how they understand and make sense of those experiences in relation to the world.

B. Research Locale
The research locale is the city of Cabuyao, where these graduates reside, and where the Pamantasan of Cabuyao is established.

C. Population and Sampling

The population used are the female alumni of the engineering courses offered in Pamantasan ng Cabuyao, namely: Industrial Engineering, Electronics Engineering, and Computer Engineering. The sampling method used was the purposive sampling technique. As stated by Ghosal (2023) [10], purposive sampling is the application of a non-random sampling method to choose respondents that have the desired characteristics or aspects related to the goals of the study. The selection process prioritized participants who offered valuable insights or brought diverse perspectives for addressing the research questions or objectives.

D. Research Participants
The participants of this study were female engineering graduates from Pamantasan ng Cabuyao. Data collection was conducted through interviews, enabling a focused exploration of the unique experiences and challenges faced by women in STEM. The specific criteria are as follows:

Table 1: Defining Characteristics of the Participants

Nature and Characteristics of Respondents	
Age	Typically, in their mid-20s to mid-30s, the participants are supposed to have graduated and begun their jobs within the past few years.
Sex	The study only included female participants to ensure that it accurately reflects the gender-specific experiences of women regarding imposter phenomenon.
Nationality	The respondents should be a Filipino, specifically from the Philippines, as the study was situated within the context of the Pamantasan ng Cabuyao.
Professional Status	All participants should be actively employed directly related to their respective jobs. They have entered the workforce in positions that are aligned with their academic qualifications.
Categorical Information	
Role	The participants are professional engineers, which may include various job titles such as industrial engineers, electrical engineers and computer engineers.
Educational Background	The participants should have graduated from the engineering program at the Pamantasan ng Cabuyao, which is important for ensuring that their experiences are relevant to the study's focus on impostor phenomenon among female engineering graduates.
Experience with Impostor Phenomenon	The study specifically targeted those who have relevant experiences of self-doubt and feelings of inadequacy despite professional success, as these experiences are important to the research's focus.

E. Research Instrumentation
The research employed a qualitative approach, wherein the researchers' gathered data through two distinct methods: a standardized impostor phenomenon scale, and an open-ended interview questionnaire. According to Cherry (2023), a survey is a method of collecting data to obtain information about individuals. Psychology researchers frequently utilize it as a means of gathering self-reported data from study participants. The researchers used an assessment tool which is the Clance Impostor Phenomenon Scale (CIPS) and a self-made interview questionnaire. The researchers provided a themed narrative qualitative data to gain insight into and provide an explanation for the impostor phenomenon among female engineering graduates.

F. Data Gathering Procedure
For the primary objectives of the study, the researchers employed a qualitative research design, specifically a phenomenological approach which helped with the in-depth analysis of the presence and underlying factors of the impostor phenomenon. This approach was implemented in two phases: First, selecting participants based on criteria that determine their experience with the impostor phenomenon and identifying which of the four characteristics of impostor syndrome they present, namely few, moderate, frequent, and intense. Second, the interviews with the selected participants with different levels of impostor phenomenon according to

their results from the CIPS.
Before proceeding to the two phases, background information was collected from the participants about the impostor phenomenon to contextualize the study, ensuring the literature included expands on a solid basis of existing knowledge, and helped hone the research questions and hypotheses. This study reviewed the relevant literature in-depth, including previous studies, frameworks, and presently available measurement or scale instruments about the impostor phenomenon. This was applied to better grasp the phenomenon from the participants, which directed the creation of the survey instruments and informed later stages of the study.
To put the data acquired from this study on the impostor phenomenon into context, the Clance Impostor Phenomenon Scale (CIPS) instrument was distributed to participants through an online, web-based process. In the screening phase of the participants, the researchers utilized the CIPS to accurately identify participants who represent the four categories of impostor characteristics: few, moderate, frequent, and intense.
Following this, semi-structured interviews were conducted with selected participants for the qualitative analysis of the study. This was so the researchers could further explore the factors and individual experiences that underlined the assessment data through semi-structured interviews.

G. Ethical Consideration

The study was conducted with the researchers' guide following the listed ethical considerations: Conflict of Interest, Harm reduction, Voluntary Participation, Informed Consent Process, and their Data Privacy rights regarding the information gained for the study.

3. Results and discussions

This chapter outlined the findings of a qualitative study exploring the perspectives of female engineering graduates experiencing the impostor phenomenon (IP). It presented how these individuals experience and navigate their impostor feelings, as well as the underlying factors contributing to these experiences.

Moreover, this chapter presented the classification order of the participants experiencing impostor phenomenon. The Clance Impostor Phenomenon Scale (CIPS) was utilized to determine the presence of the impostor phenomenon among the participants. Through the screening phase and semi-structured interviews, the study provides a deep understanding of the factors that shaped the participants' impostor phenomenon experiences. The recurring themes are identified and analyzed to provide details and insights into the challenges experienced by female engineering graduates.

Table 2: Classification Order of the Participants Based on their Characteristics of Impostor Phenomenon

Participant	Raw Score	Range	Impostor Phenomenon Characteristics
IPI 8	87	Higher than 80	Intense IP Experiences
IPI 7	82	Higher than 80	Intense IP Experiences
IPFr 6	79	61 – 80	Frequently has Impostor Feelings
IPFr 5	74	61 – 80	Frequently has Impostor Feelings
IPM 4	58	41 – 60	Moderate IP Experiences
IPM 3	55	41 – 60	Moderate IP Experiences
IPF 2	39	Less than 40	Few Impostor Characteristics
IPF 1	37	Less than 40	Few Impostor Characteristics

Clance Impostor Phenomenon Scale (CIPS) was used to assess the presence of the impostor phenomenon among the female engineering graduates. Participants' scores were calculated by summing their raw scores, and they were ranked from highest to lowest. All participants who exhibited characteristics of the impostor phenomenon were invited for an interview. This approach aligned with the research objectives, ensuring that data was collected from those experiencing IP. The researchers also included all participants with the presence of impostor phenomenon to capture a broad range of experiences, allowing for an understanding of how the phenomenon manifests at different levels.

4. Discussion

After analyzing the results of this study, the following emerging concepts have been designed to illustrate the experiences of female engineering graduates and their struggles with impostor phenomenon.
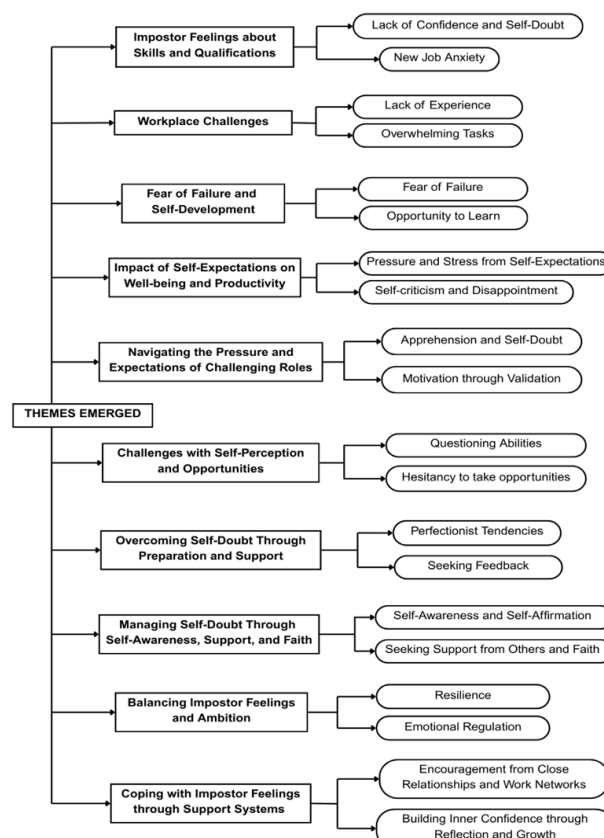

Fig 1: Thematic Map of Superordinate and Sub-themes

This discussion presented the emerging themes derived from the respondents' narratives and responses. Through careful and repeated analysis of the data, the researchers identified key themes that reflect the participants' shared experiences and insights as follows: (1) Impostor Feelings about Skills and Qualifications, (2) Workplace Challenges, (3) Fear of Failure and Self-Development, (4) Impact of Self-Expectations on Well-being and Productivity, (5) Navigating the Pressure and Expectations of Challenging Roles, (6) Challenges with Self-Perception and Opportunities, (7) Coping Mechanisms, (8) Managing Self-Doubt Through Self-Awareness, Support, and Faith, (9) Balancing Impostor Feelings and Ambition, and (10) Coping with Impostor Feelings Through Support Systems. As a result, subordinate themes were identified and utilized to further support the study, as demonstrated by the following: for Workplace Challenges, (a) Lack of Skills and (b) Overwhelming Tasks; for Fear of Failure and Self-Development, (a) Fear of Failure and (b) Opportunity to Learn; for Impact of Self-Expectations on Well-being and Productivity, (a) Pressure & Stress from Self-Expectations and (b) Disappointment & Self-Criticism; for Navigating the Pressure and Expectations of Challenging Roles, (a) Apprehension and Self-Doubt and (b) Validation as Motivation; for Coping with Impostor Feelings Through Support Systems, (a) Encouragement from Close Relationships and (b) Confidence Through Reflection and Growth.

Impostor Feelings about Skills and Qualifications
This study found that all participants expressed self-doubt regarding their skills and qualifications. One participant expressed, *"Starting my first job, I felt a mix of excitement and nervousness. I wasn't sure if I was fully prepared and often found myself doubting whether I could keep up…"*. This was evident both during the job application process and after securing their positions. Many lacked confidence in their abilities and often felt undeserving of their roles.

Workplace Challenges
This study identified two main challenges in the workplace: (1) lack of experience and (2) overwhelming tasks. Three participants expressed that their prior education and training were insufficient for their current roles. In which one participant shared, *"…It was not taught in college. That is the first time I heard of that skill. Like the first task na binigay sakin, di ko naman alam kung anong gagawin don, kasi 'indi naman yon tinuro, so bakit yon pinapagawa sakin?"* One participant reported that, *"There were also times when tasks felt overwhelming, and I struggled to keep up with expectations while still trying to figure things out…"* Expressed their struggles with workload management and difficulty keeping up with assigned tasks.

Fear of Failure and Self-Development
This research found that two participants experienced fear of failure, believing that making mistakes would expose them as frauds. One participant expressed, *"…Minsan, may fear din siguro ako na baka ano.. parang ma-discover nila, hindi pala ako qualified or parang hindi naman ako magaling…"* On the other hand, four participants viewed negative feedback as an opportunity to learn, showing a willingness to grow despite their doubts. In which one reported, *"…Instead of feeling bad, I took it as a chance to learn from my colleagues…"*.

Impact of Self-Expectations on Well-being and Productivity
The study found that five participants placed immense pressure on themselves, setting high personal standards. In which one participant expressed, *"…Pag may mataas na expectations ako sa sarili ko, minsan nawawala yung motivation ko. Kasi kapag feeling ko hindi ko na meet yung standards ko, parang hindi ko na alam kung anong value ko sa trabaho…"* When they failed to meet these expectations, they experienced stress, frustration, and self-criticism that negatively affected their emotional well-being.

Navigating the Pressure and Expectations of Challenging Roles
This research found that five participants were apprehensive about leadership roles due to self-doubt regarding their capabilities. In which one participant expressed, *"Yung sa leadership roles, medyo apprehensive ako na tanggapin. Naghe-hesitate ako kunin yung role na 'yon kasi madalas ko naiisip na hindi talaga ako magaling tapos takot rin ako na baka pagalitan lang ako lagi tapos i-babackstab ng mga kasama ko sa trabaho kapag may mali akong nagawa."* However, some participants used external validation as motivation to push themselves and meet expectations.

Challenges with Self-Perception and Opportunities
The study revealed that participants hesitated to take on leadership roles and career advancements due to their low self-perception. Expressing that, *"Impostor feelings definitely affect my decision-making and make me hesitate to grab opportunities that could offer growth and help me move forward in my career…"* They feared they were not qualified enough and questioned their abilities, leading them to avoid new opportunities.

Coping Mechanisms
The study found that most participants coped with self-doubt through over-preparation, often overcompensating for their perceived incompetence. Many relied on feedback and support from mentors, colleagues, and family members to reassure them of their capabilities.

Managing Self-Doubt Through Self-Awareness, Support, and Faith
Four participants expressed their attempts to combat impostor feelings through self-awareness, trying to stop themselves from overthinking and panicking. While many struggled, they found comfort in self-reflection, faith, and external support.

Balancing Impostor Feelings and Ambition
This study found that despite experiencing impostor feelings, some respondents used their self-doubt as motivation to succeed. They worked to regulate their emotions and push themselves forward, though only a few were fully successful.

Coping with Impostor Feelings Through Support Systems
The study revealed that encouragement from mentors, colleagues, family, and friends played a significant role in helping respondents overcome self-doubt. Emotional and moral support, as well as self-reflection, were critical in managing impostor feelings.
The main objective of this qualitative research was to explore the experiences of female engineering graduates and their

struggles with impostor phenomenon. The findings revealed that respondents exhibited impostor feelings, workplace challenges, fear of failure, and self-doubt, which impacted their well-being and career growth. The study also showed that despite these struggles, some participants managed to utilize external validation and support systems to navigate through these feelings of self-doubt. Furthermore, based on these findings, this study recommends implementing structured support programs designed to help female engineers overcome impostor feelings and develop confidence in their professional roles. This study also underscores the need for further investigation into culture-specific manifestations. Moreover, these findings contribute to a deeper understanding of the challenges faced by female engineers and emphasize the importance of targeted support programs and interventions. One proposed initiative by the researchers is MindStrength, a mental health support program that offers workshops, counseling, and mentorship with licensed professionals, allowing female engineers to receive guidance from experts while also engaging in peer discussions with individuals facing similar experiences. Additionally, career development programs focused on resilience training, self-efficacy building, and confidence enhancement should be made accessible, equipping professionals with strategies to navigate impostor feelings in the workplace. Through structured mentorship, coaching, and action plans tailored to personal and career growth, individuals can develop long-term confidence and work towards overcoming impostor phenomenon. These initiatives aim to provide female engineers with the tools and support necessary to foster a positive mindset, strengthen their belief in their skills, and promote continuous professional and personal development.

5. References

1. Bravata DM, Watts SA, Keefer AL, Madhusudhan DK, Taylor KT, Clark DM, *et al*. Prevalence, predictors, and treatment of impostor syndrome: a systematic review. J Gen Intern Med. 2019 Dec 17;1252-75. doi:10.1007/s11606-019-05364-1.
2. Cabuen AM, Dela Cruz PC, Figueroa GM, Regudon NA. The lived experiences of academic scholars experiencing the impostor phenomenon (Final Manuscript) [Internet]. 2021 [cited YYYY MMM DD]. Available from: https://www.studocu.com/ph/document/national-university-philippines/bs-psychology/the-lived-experiences-of-academic-scholars-experiencing-the-impostor-phenomenon-final-manuscript/22842757
3. Cahiles-Magkilat B. PH has widest gender gap in STEM workforce [Internet]. Manila Bulletin. 2023 Jul 4 [cited YYYY MMM DD]. Available from: https://mb.com.ph/2023/7/4/ph-has-widest-gender-gap-in-stem-workforce
4. Chakraverty D. Impostor phenomenon among engineering education researchers: an exploratory study. Int J Doctoral Stud. 2021;16:757-76. doi:10.28945/4883.
5. Clance PR, Imes SA. The imposter phenomenon in high achieving women: dynamics and therapeutic intervention. Psychotherapy (Chic). 1978;15(3):241-7. Available from: https://psycnet.apa.org/record/1979-26502-001
6. Clark P, Holden C, Russell M, Downs H. The impostor phenomenon in mental health professionals: relationships among compassion fatigue, burnout, and compassion satisfaction. Contemp Fam Ther. 2021 Apr 30;44:185-97. doi:10.1007/s10591-021-09580-y.
7. Delmas PM, Giles RL. Qualitative research approaches and their application in education [Internet]. 2022 Nov 18 [cited YYYY MMM DD]. Available from: https://www.sciencedirect.com/science/article/abs/pii/B9780128186305110036
8. Fry R, Kennedy B, Funk C. STEM jobs see uneven progress in increasing gender, racial and ethnic diversity [Internet]. Pew Research Center. 2021 Apr 1 [cited YYYY MMM DD]. Available from: https://www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/
9. Gatchpazian A, Davis T. Imposter syndrome: definition, causes, & how to deal with it [Internet]. Berkeley Well-Being Institute. 2024 [cited YYYY MMM DD]. Available from: https://www.berkeleywellbeing.com/imposter-syndrome.html
10. Ghosal S. Purposive sampling [Internet]. Wall Street Mojo. 2023 Dec 18 [cited YYYY MMM DD]. Available from: https://www.wallstreetmojo.com/purposive-sampling/
11. Jamison L. Why everyone feels like they're faking it: the concept of impostor syndrome has become ubiquitous. The New Yorker [Internet]. 2023 Feb 6 [cited YYYY MMM DD]. Available from: https://www.newyorker.com/magazine/2023/02/13/the-dubious-rise-of-impostor-syndrome
12. Jnanathapaswi SG. Thematic analysis & coding: an overview of the qualitative paradigm [Internet]. ResearchGate. 2021 Dec [cited YYYY MMM DD]. Available from: https://www.researchgate.net/publication/356924218_Thematic_Analysis_Coding_An_Overview_of_the_Qualitative_Paradigm
13. Lambert J. How to address and manage imposter syndrome [Internet]. Informi. 2023 Sep 26 [cited YYYY MMM DD]. Available from: https://informi.co.uk/blog/how-to-address-manage-imposter-syndrome
14. Levant B, Nguyen E, Villwock JA, Manzardo AM. Greater objective and perceived competence for clinics is associated with reduced stress but no change in impostorism in medical students. OBM Integr Complement Med. 2023;8(2):018.
15. Lewis O. Women more likely to suffer from imposter syndrome than men, according to research [Internet]. Independent. 2023 Apr 7 [cited YYYY MMM DD]. Available from: https://www.independent.co.uk/life-style/women-imposter-syndrome-workplace-confidence-b2313770.html
16. Raypole C. You're not a fraud. Here's how to recognize and overcome imposter syndrome [Internet]. healthline. 2021 Apr 16 [cited YYYY MMM DD]. Available from: https://www.healthline.com/health/mental-health/imposter-syndrome
17. Robinson C, Williams H. Interpretative phenomenological analysis: learnings from employing IPA as a qualitative methodology in educational research. Qual Rep. 2024;20(4):939-52. Available from: https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=6487&context=tqr

18. STEM Women. An increasing number of female and non-binary STEM students are experiencing imposter syndrome [Internet]. 2023 Apr 18 [cited YYYY MMM DD]. Available from: https://www.stemwomen.com/increasing-number-stem-students-experiencing-imposter-syndrome

19. The Institution of Engineering and Technology. Over one million women now in STEM occupations but still account for 29% of STEM workforce [Internet]. 2024 Mar 8 [cited YYYY MMM DD]. Available from: https://www.theiet.org/media/press-releases/press-releases-2024/press-releases-2024-january-march/8-march-2024-over-one-million-women-now-in-stem-occupations-but-still-account-for-29-of-stem-workforce

20. Ugwu CN, Eze VH. Qualitative research [Internet]. ResearchGate. 2023 Jan [cited YYYY MMM DD]. Available from: https://www.researchgate.net/publication/367221023_Qualitative_Research