

An exploratory study of factors influencing career decisions of Generation Z women in Data Science

**Authors:**

Milind Bhore¹ 
Poornima Tapas¹ 

Affiliations:

¹Symbiosis Institute of Business Management, Symbiosis International Deemed University, Pune, India

Corresponding author:

Milind Bhore,
milind_bhore@rediffmail.com

Dates:

Received: 06 Nov. 2022

Accepted: 14 Feb. 2023

Published: 23 Mar. 2023

How to cite this article:

Bhore, M., & Tapas, P. (2023). An exploratory study of factors influencing career decisions of Generation Z women in Data Science. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 21(0), a2168. <https://doi.org/10.4102/sajhrm.v21i0.2168>

Copyright:

© 2023. The Authors. Licensee: AOSIS. This work is licensed under the Creative Commons Attribution License.

Read online:

Scan this QR code with your smart phone or mobile device to read online.

Orientation: Since April 2022, there has been a 30% increase in Data Science job openings globally. The majority of these positions are filled by Generation Z talent (Gen Z). According to research, businesses that promote gender diversity have higher earnings and revenues.

Research purpose: The purpose of this study is to identify factors that will help organizations in designing policies and work environment to attract and foster Gen Z women employees in Data Science.

Motivation for the study: There is limited research focusing on Gen Z women professionals and factors influencing their career choices in the field of Data Science in the Indian context.

Research approach/design and method: Structured questionnaire was distributed online. Purposive sampling technique was adopted and 216 responses from Gen Z women studying in technology institutes pan India and working in Data Science were collected. Multiple linear regression statistical technique was leveraged for data analysis.

Main findings: Technical education, job opportunities, compensation and conducive environment significantly and positively influence career decisions of Gen Z women in Data Science.

Practical implications: Organizations will be able to define policies to encourage hiring of Gen Z women, break stereo types that prevent women from pursuing career in Data Science and create a conducive work environment that acknowledges and rewards the performance of Gen Z women.

Contribution/value-add: The findings of this study will encourage more women from Gen Z to pursue careers in Data Science, boosting gender diversity and inclusivity in Data Science.

Keywords: Gen Z women; career; Data Science; technology; Science, Technology, Engineering, and Mathematics (STEM).

Introduction

The field of Data Science as a career opportunity has seen exponential growth as compared with the other information technologies (ITs). Data Science technology, however, is proving to be highly critical and playing a pivotal role in creating path-breaking innovations. Data Science has evolved beyond a mere statistical problem-solving tool to help resolve real-life issues and create reliable predictions in various industries. Information technology organizations are leveraging Data Science in various projects spanning different domains such as life sciences, banking and finance, healthcare, defence, automotive and engineering. The workforce engaged in Data Science is largely males. The scenario is however fast changing with more women taking up careers in Data Science, which is very encouraging. Organizations have started realising the importance of hiring and engaging a diverse workforce in order to succeed in their endeavours. To succeed in this highly competitive environment, organizations are rapidly transforming and automating their process and systems and hiring talent with latest skills. Organizations are rapidly transforming to latest and advanced technologies such as Data Science, artificial intelligence (AI), machine learning (ML), etc., are being leveraged (Lu, 2017). Human talent is the key for the business transformation. Business managers are required to timely hire the right talent for the organizations (Maloni et al., 2019). Approximately 70% of job openings for the advanced and futuristic technologies exist at junior level and rest up the hierarchy (NASSCOM, 2020). Organizations engage in maximum hiring at entry level, which comprises Generation Z talent (Gen Z).

Organizations feel the need to turn their attention towards the career of the future workforce, which is Gen Z (Pandita, 2021). According to studies conducted, Gen Z is the generation of people born between the years 1996 and 2012 (Berkup, 2014). Brodie explained through his studies that research is carried out with the intent to innovate and discover new solutions. To discover and to answer to the Why question in research, empirical science and other methods are used and to discover the answer to What question, predominantly Data Science is used (Kelleher & Tierney, 2018). Data Science extracts meaningful and useful knowledge after analysing vast data, which helps build important predictive models. It is concerned with the analysis of big data to extract correlations with projection of probabilities and flaws, which may occur (Brodie, 2019). Data Science helps expedite the research work by rapidly reducing the search space from a large number of correlations or probable outcomes to a considerably smaller number. Non-Data Science methods such as clinical trials or scientific experiments are then used to analyse these probable results, which are less in number to verify or reject the result, that is, to establish if a causal relationship exists in the automatically generated hypotheses.

The field of Data Science has emerged as an important driving force of transformation across the industry. This emphasises the importance of upskilling of talent. It is an area of prime interest and relevance within STEM (Berman & Bourne, 2015). Considering the large span and scope, Data Science exhibits the capacity to enhance gender diversity and inclusiveness.

For Data Science to emerge as a field that promotes gender diversity, two challenges need to be addressed:

- How to encourage women in obtaining education and gather skills that will help them pursue careers in Data Science?
- How to enable a conducive environment at work that will help attract, retain and progress women in Data Science?

There is little literature on the subject matter and hence a proactive attempt is being made to identify factors that influence the careers of women in Data Science with a focus on Gen Z women. This will help to identify factors that influence the career decisions of Gen Z women in Data Science. This research will help to establish academicians and organizations establish curricula, policies and practices to help educate and encourage more women to build careers in Data Science.

Literature review

Generation Z

This exploratory research is based on Herzberg's two-factor theory consisting of hygiene and motivational factors. Today the workplace comprises multigenerational workforce, which comprises employees belonging to the Generation X, Generation Y and Generation Z (Prawitasari,

2018). People born between the years 1996 and 2012 are known as belonging to Gen Z (Strauss & Howe, 1991). Out of the multiple generational workforce, Gen Z are the latest generation to join the organizations for work (Burton et al., 2019). According to a research, Gen Z are quick to learn and adapt to new technologies and organizations feel the need to conduct research about their career aspirations (Ozkan & Solmaz, 2015). Gen Z are now completing their education and taking up work with organizations. They will soon form a majority of the workforce population and organizations feel the need to understand their career aspirations and feel the need to create policies and a work environment (Sidorcuka & Chesnovicka, 2017). Constant and accelerated quick changes in technology, social environment and culture is impacting the work conditions and the thought process of the Gen Z. It is important for organizations to understand this talent and create a work environment that is conducive for this workforce, which will attract this talent to the join the organizations.

Women in Data Science

Data Science is used to expedite and curtail the search from a large number of probable results to a much smaller possible results. The newly budding field of Data Science is a driving force of innovation in almost all sectors thereby creating a big scope for workforce development and a field of importance within science, technology, engineering and mathematics (Kelleher & Tierney, 2018). Data Science involves analysis of large data to draw meaningful insights, which can help innovations. Data Science practices STEM method; however, it involves much more in terms of managing large data sets, in-depth statistical analysis and drawing of inference to convey outcomes. There is a huge demand for Data Science skills world over. According to McKinsey report, the USA alone has a need for more than 1 million Data Science professionals (Berman & Bourne, 2015). There is great demand and need for creating a larger pool of Data Science professionals. It has become critical to have more Data Science professionals ready for the industry. This skill gap needs focused attention as it is critical to address this industry requirement and conscious efforts need to be taken. Being a relevantly new field, Data Science offers opportunity for diverse workforce to build careers and thereby creating a scope to reduce the existing gender gap in STEM, which is employing only 13% women engineers and only 25% women engineers who are computers and mathematical sciences qualified (National Science Board, 2014). Encouraging gender parity and more women Data Science professionals is a need of the hour. Research shows that organizations who have engaged workforce with diverse inherent traits and traits acquired through experience have 45% more possibility to grow their market share over the earlier year. Organizations with such diversity have also shown 70% more possibility to report acquisition of new market (Hewlett et al., 2013). Organizations whose executive board consists of diverse leadership have earned returns on equity (Barta et al., 2012). Diversity in the private sectors has proven to give a competitive advantage and is an asset for the organizations.

It is not just important for the organisations to have a diverse workforce in the Data Science or STEM field, but it has become an important agenda for business and communities (Education Committee on STEM & National Science and Technology Council, 2013). According to the research findings, organisations are fast transforming to newer technologies such as Data Science and because Gen Z workforce is trained on STEM they are most preferred by organisations (Gregory, 2021). According to research, Gen Z are trained to work on latest technologies and find it is easy to adopt to new technologies and process the information much faster than the workforce of earlier generation (Moore et al., 2017). Gen Z have an inherent ability to multitask between multiple tasks at work for which they leverage technology and devices efficiently (Shatto & Erwin, 2017). Gen Z are graduating out of institutes and taking up jobs at the workplace, which has made organisations realise that it is important to understand the needs of Gen Z workforce and provide them with a conducive environment at work in order to succeed (Iorgulescu, 2016). To sustain the ever-increasing competition in the business environment and to succeed at business, organisations would need to encourage a career path for women and advance gender fairness in order to leverage their talent and contributions and not miss on them (Fitong Ketchiwou et al., 2022). This would give them a competitive advantage and they can reap the advantages of the contributions of the much more diversified workforce if they include more gender diversity in the workplace (Chang & Milkman, 2020). According to research conducted gender diversity and inclusiveness would increase company's sales and not just give a commercial advantage or profits but also improve the engagement and efficiency among the workforce thereby leading to organisation success (Cavero-Rubio et al., 2019). According to research conducted by Hammond and Coetzee (2022), consistency in the application of human resource policies and procedures and work-life balance in workload and deadlines, as well as formalised consistency in the application of training and development programmes are key issues that must be addressed in a retention strategy.

Research gap

Data Science is relevantly a new field in the information technology sector. As of date, few women are working in the Data Science field. Gen Z women have now started graduating from institutes and making decisions to build their careers in the technology world. Research work is available regarding factors influencing the careers of women employees; however, not much literature on Gen Z women and their careers in Data Science is available. This is proactive research to study factors influencing career decisions of Gen Z women in Data Science as not much research is available regarding the careers of Gen Z women specific to careers in Data Science. This research will add to the literature that organisations and researchers can refer to, for designing processes to enable careers of Gen Z women in Data Science.

Objective of the study

Almost 70% of job opportunities for future skills such as Data Science, ML and AI are at the entry level, according to the NASCOM 2020 report. The next generation of workforce is Gen Z. Science, Technology, Engineering, and Mathematics-educated Gen Z talent would be taking up Data Science roles in the corporates in the present and near future. Current hiring processes have been designed by organisations to attract the earlier generation of the workforce. Corporations have to redesign the hiring strategy, which may need further customization to attract and onboard more women in the organisations for Data Science.

Despite the availability and presence of skilled women workforce in the labour market, they are clearly less in number in the field of Data Science than their male colleagues. The STEM-educated Gen Z women employees are now graduating to take up jobs in the corporate, and there is an excellent opportunity to improve their participation in the emerging technology field of Data Science, thereby improving the gender diversity ratio. This study aims to identify factors influencing the career decisions of Gen Z women in Data Science. This article seeks to bring forth factors influencing Gen Z women to make a career in Data Science. The authors have carried out exploratory research and have attempted to highlight some of the prominent factors that influence Gen Z women to build their careers in a relatively new and highly technical field of Data Science. The authors have prescribed a model that the various stakeholders can leverage to enable the careers of Gen Z women in the field of Data Science, thereby helping create a diverse workforce in the organisations that may lead them to success. This research will help identify important factors that will help organisations to design processes, systems and work environments to attract and foster Gen Z women employees in Data Science. The findings will help to synthesise the organisation's policies and processes to help grow Gen Z women in Data Science. This research will help us to identify critical factors and solutions to enable more women to get education and skills in Data Science. It will help organisations to create a conducive work environment that will allow more women to take up roles in Data Science. The improvement in gender diversity at work will help improve the organisation's performance and thereby improve profitability. The research aims to help organisations and institutions understand the sensitivities involved in helping Gen Z women flourish in their careers in Data Science and bring a change in the existing education process and organisation culture.

Research methodology

A multiple-choice questionnaire has been designed and survey conducted to collect primary data. While choosing the Gen Z women respondents, the purposive sampling technique has been adopted. This technique does not need grounding of theories. Primary data have been collected

from Gen Z women studying in technology institutes pan India and Gen Z women working in Data Science (Emerson, 2021). Respondents have been deliberately chosen to respond to the survey by applying their judgement. The authors have chosen the Gen Z women respondents because they all have education in technology and possess the required capabilities to respond to the questionnaire, that is, education in STEM technology.

Responses from 216 respondents have been collected. Proportionate stratified sampling method has been used to arrive at the number of respondents using the formula:

$$N = (z^2 * s^2) / e^2 \quad [\text{Eqn 1}]$$

where N is the sample size, z is the standard score with 92% accuracy, that is, 1.96 as defined and borrowed from the standard table, s is the variance in data computed as a ratio of range/6 = 0.66 and e is the tolerance of 9%. A buffer of 5% has been considered to accommodate corrections and discarding six incorrect responses we arrived at the final sample size of 210. Size of the sample corresponds to the strata in the population.

Tests of reliability and validity

Any measurement that has zero or very little random measurement error is considered to be reliable. An arbitrary distortion in the measurement process can be brought about by a random measurement error. Unreliable measurements could be the outcome of this. As given in Table 1 Cronbach's alpha is used to evaluate the data's validity and dependability. The data are reliable and genuine because the Cronbach's alpha score was discovered to be 0.826, which is above the 0.7 threshold limit.

Test of normality

Statistical tools such as normal PP plots and residual graphs have been used to examine the normality and the data are found to be normally distributed.

In Figure 1, the distribution of the responses collected for measuring the influence of technical education in choosing Data Science as a career are close to the line of normality, which shows that data are normally distributed.

In Figure 2, the distribution of the responses collected for measuring the influence of job opportunities in choosing Data Science as a career are close to the line of normality, which shows that data are normally distributed.

In Figure 3, the distribution of the responses collected for measuring the influence of compensation in choosing Data

Science as a career, are close to the line of normality, which shows that data are normally distributed.

In Figure 4, the distribution of the responses collected for measuring the influence of work environment in choosing

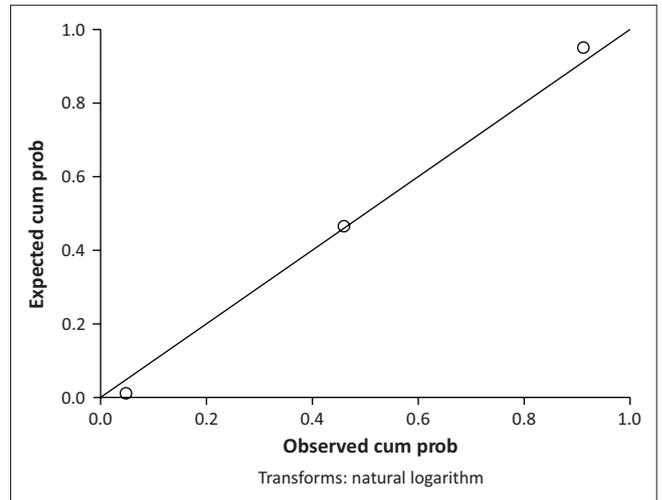


FIGURE 1: Normal PP plot of regression standardised residual: Technical education.

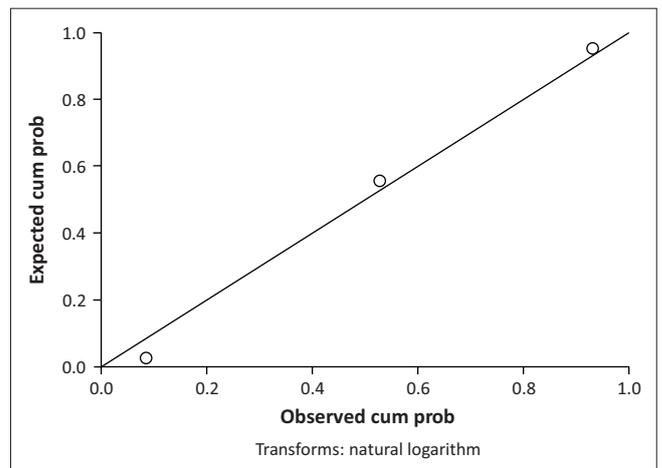


FIGURE 2: Normal PP plot of regression standardised residual: Technical education.

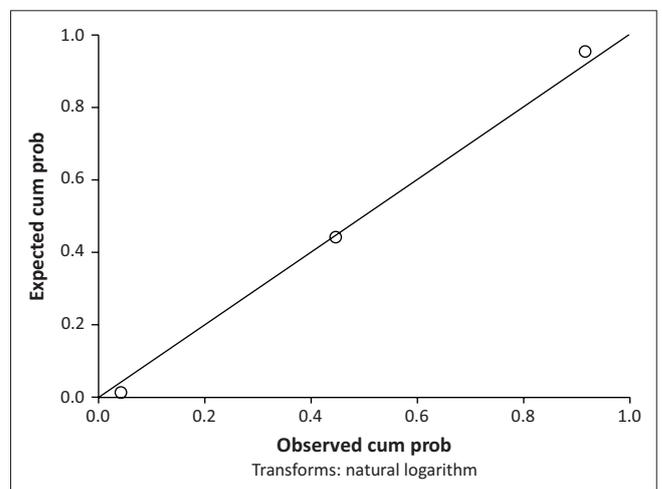


FIGURE 3: Normal PP plot of regression standardised residual: Compensation.

TABLE 1: Test of reliability.

| Cronbach's alpha | Cronbach's alpha based on standardised items | Number of items |
|------------------|--|-----------------|
| 0.826 | 0.833 | 5 |

Data Science as a career are close to the line of normality, which shows that data are normally distributed.

Multicollinearity

Multicollinearity exists when independent variables are strongly correlated. If correlation exists, the problem of multicollinearity should be addressed as it is difficult to interpret the model and creates overfitting problem. As given in Table 2 the VIF of all the independent variables has been analysed using variance inflation factor (VIF). The VIF of all the independent variables was found below four, which indicates the absence of multicollinearity in the data. Hence, multicollinearity was not a concern for running the multiple linear regression model.

Data analysis and interpretation

Descriptive statistics and correlation statistics

As given in Table 3 the mean value of all the independent variables has been found to be four or above, which indicates that the respondents agree to the fact that the explanatory variable considered for the study, such as technical education, job opportunities, compensation and a conducive work environment influence the career decisions among Gen Z women in Data Science. The standard deviation has been found to be less than the mean score suggesting that the data are distributed around the mean. When the standard deviation is less than the mean value, it indicates that the data are clustered around the mean.

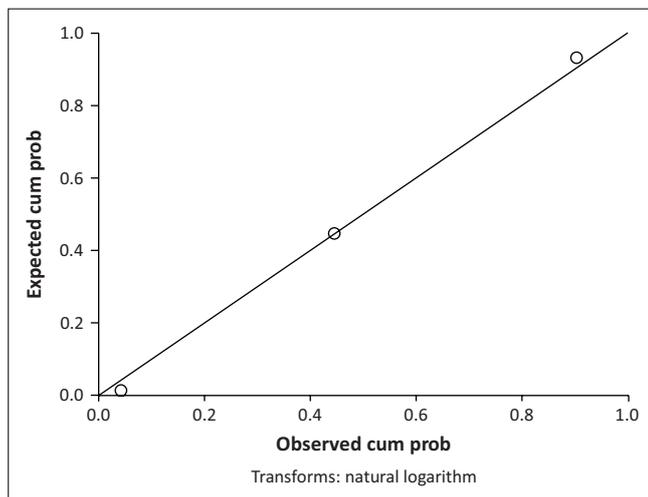


FIGURE 4: Normal PP plot of regression standardised residual: Work environment.

TABLE 2: Test of multicollinearity coefficients.†

| Model | Unstandardised coefficients | | Standardised coefficients | t | Sig. | Collinearity statistics | |
|---------------------|-----------------------------|----------------|---------------------------|-------|-------|-------------------------|-------|
| | B | Standard error | Beta | | | Tolerance | VIF |
| (Constant) | 0.076 | 0.161 | - | 0.474 | 0.636 | - | - |
| Technical education | 0.233 | 0.034 | 0.257 | 6.836 | 0.000 | 0.795 | 1.258 |
| Job opportunity | 0.175 | 0.032 | 0.210 | 5.399 | 0.000 | 0.740 | 1.351 |
| Compensation | 0.274 | 0.036 | 0.315 | 7.639 | 0.000 | 0.662 | 1.510 |
| Work environment | 0.327 | 0.033 | 0.393 | 9.958 | 0.000 | 0.722 | 1.386 |

VIF, variance inflation factor.

†, Dependent Variable: Career Decision.

As given in Table 4 the correlation between career decision and conducive work environment has been found to be strong with Pearson correlation score of 0.717, whereas the correlation between technical education and the other independent factors, namely, job opportunities, compensation and conducive work environment, is found to be weak with Pearson correlation score of less than 0.5. The relationship between compensation and career decision is also found to be strong, suggesting that compensation and recognition strongly influence career decisions.

Responses of Gen Z women to the following statements have been analysed to understand the influence of technological education, job opportunities, compensation, conducive working environment on the career decision of Gen Z women in Data Science using 5-point Likert Scale:

- Technological education helps you to take up career in Data Science.
- Job opportunities for Data Science professionals influenced you to choose a career in Data Science.
- Is better compensation a criterion for you to choose a career in Data Science.
- Conducive work environment for Gen Z women in organizations helps you to make a career in Data Science.

Hypotheses

The extant documented literature deals with various factors influencing career decisions. Whereas, to the best of our knowledge, no study has attempted to understand the factors affecting the career decisions of Gen Z women in Data Science, as Data Science is an emerging field and only 20.4%

TABLE 3: Descriptive statistics.

| Factors | Mean | Standard deviation | N |
|-------------------------------|--------|--------------------|-----|
| Descriptive statistics | | | |
| Career decision | 4.2010 | 0.46957 | 210 |
| Technical education | 4.0735 | 0.51527 | 210 |
| Job opportunities | 3.9951 | 0.55706 | 210 |
| Compensation | 4.1275 | 0.53768 | 210 |
| Working environment | 4.1225 | 0.56992 | 210 |

TABLE 4: Correlation of variables.

| Factors | Career | Technical education | Job opportunity | Compensation | Work environment |
|---------------------|--------|---------------------|-----------------|--------------|------------------|
| Career | 1.000 | 0.590 | 0.588 | 0.698 | 0.717 |
| Technical education | 0.590 | 1.000 | 0.344 | 0.375 | 0.389 |
| Job opportunity | 0.588 | 0.344 | 1.000 | 0.463 | 0.359 |
| Compensation | 0.698 | 0.375 | 0.463 | 1.000 | 0.463 |
| Work environment | 0.717 | 0.389 | 0.359 | 0.463 | 1.000 |

of women are working in the Data Science field. In this study, we have attempted to examine if technical education, job opportunities, compensation and a conducive environment influence the career decisions of Gen Z women in Data Science. The hypotheses for the study are as follows:

H₀: Technical education, job opportunities, compensation and conducive environment do not influence career decisions of Gen Z women in Data Science.

H₁: Technical education influences career decisions of Gen Z women in Data Science.

H₂: Job opportunities influence career decisions of Gen Z women in Data Science.

H₃: Compensation influences career decisions of Gen Z women in Data Science.

H₄: Conducive working environment influences career decisions of Gen Z women in Data Science.

Regression results

Regression analysis is the statistical technique that empirically establishes the relationship between the explanatory variables and predictor variables. The regression results demonstrated in Table 5 are divided into two parts where part A depicts coefficient analysis and part B depicts model estimates to ascertain the models fit. The value of adjusted r^2 is found to be 77.9%, which indicates that 77.9% of the variance in dependent variable is explained by the independent variables.

The statistical results suggest that 1% change in technical education will lead to 21.9% change in career decision, 1% change in job opportunities will lead to 17.8% change in career decision, 1% change in compensation will lead to a 28.5% change in career decision and 1% change in work environment will lead to 32.7% change in career decision. It is observed that the highest influence on career decision is made because of change in work environment.

Recommendations and conclusion

Technical education, job opportunities, compensation and conducive environment have been found to influence the career decisions of Gen Z women in Data Science. Women have been predominantly discouraged from starting and maintaining their careers in Data Science because of the gender pay gap, poor career advancement, a culture that is dominated by men, a lack of mentorship opportunities and discriminatory hiring practices. However, technology occupations are appealing to women who are pursuing them. Women work in the technology industry in a variety of roles, but there is room for improvement. Educational institutions and organisations should work to foster an environment where Gen Z women can pursue STEM degrees and start careers in the field of Data Science, which has a severe global shortage of skilled workers. A cultural shift in the business world and educational system can aid in developing a workforce with a variety of backgrounds. Organisations can use the model the authors

have suggested to enable Gen Z women in Data Science. The approach offers four recommendations for various stakeholders, such as educational institutions offering technology and STEM education and for businesses.

Conceptual model

The authors have suggested a four-step conceptual model given in Figure 5. It will help various stakeholders such as organisations and educational institutions providing STEM education to enable career decisions of Gen Z women in Data Science.

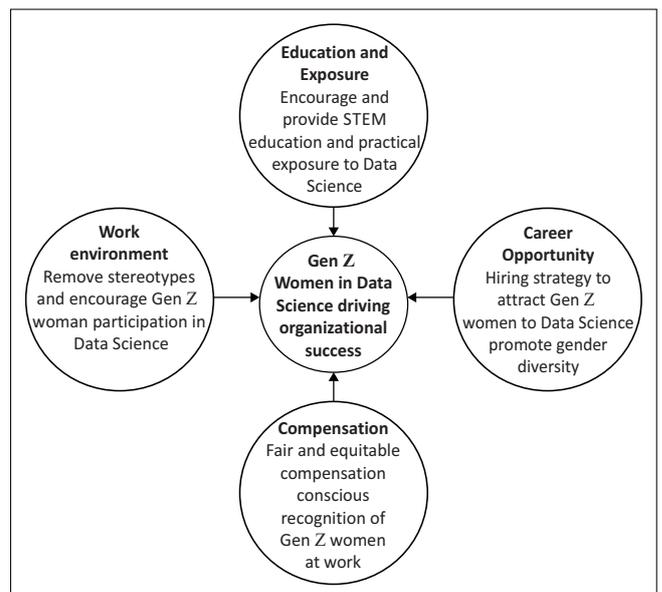
Recommendations for various stakeholders

Education and exposure

Science, Technology, Engineering, and Mathematics education may be incorporated into the course content by institutions involved in technology education. Encourage Gen Z female students to pursue STEM degrees so that they would find it simple to transition into a profession in Data Science. Gen Z women will be helped to grasp Data Science jobs and build confidence if they are exposed to Data Science early on through real-world projects and live assignments with enterprises. They would be capable of handling the task and not be concerned

TABLE 5: Regression coefficients.

| Variables | Unstandardised coefficients | | Standardised coefficients | t | Sig. |
|---------------------|-----------------------------|----------------|---------------------------|--------|-------|
| | B | Standard error | Beta | | |
| (Constant) | 0.071 | 0.160 | - | 0.447 | 0.655 |
| Technical education | 0.219 | 0.034 | 0.241 | 6.369 | 0.000 |
| Job opportunity | 0.178 | 0.033 | 0.211 | 5.444 | 0.000 |
| Compensation | 0.285 | 0.036 | 0.326 | 7.973 | 0.000 |
| Work environment | 0.327 | 0.032 | 0.397 | 10.089 | 0.000 |



STEM, Science, Technology, Engineering, and Mathematics; Gen Z, Generation Z.

FIGURE 5: Proposed model to enable careers decisions of Gen Z women in data science.

about science or mathematics, which many pupils believe to be challenging to acquire. Education institutions can set up a career counselling cell via which they can invite working Data Science practitioners to provide guest lectures. Faculty members and business professionals can advise and direct Gen Z women to consider careers in STEM fields such as Data Science. This will raise awareness of the field of Data Science as a possible career path and spark early enthusiasm in Gen Z women students to pursue STEM degrees that will equip them for a future in Data Science. It has been found that students who enrol in reputable universities with solid infrastructure and instructors who are tech-aware are exposed to STEM and technological subjects such as Data Science early on. When compared with other students who attend schools without the resources and staff needed to teach students about STEM and emerging fields of technology such as Data Science, they are better able to take advantage of this chance to pursue a career in the industry. In order to counsel and educate Gen Z women and give them early exposure to STEM education and practical exposure to Data Science, the Career Counselling Cells and faculty members can create particular standards with a focus on Gen Z women. In the near future, Gen Z women will have a healthy representation in the workforce, and this will contribute to the development of a robust pipeline of Data Science professionals not just in India but globally.

Career opportunity

Companies need to be aware of the benefits and significance of hiring a diverse and inclusive workforce. The management should build a diverse and inclusive workforce by leveraging best practices in talent acquisition and resource deployment and workplace diversity initiatives. This will contribute to fostering a positive workplace culture in the organisations. Organisations that have used a diverse workforce have shown greater financial performance and the potential to generate more business. The advantages of a competent and diverse workforce have already been established. Organisations are advised to develop a clear hiring plan that calls for employing Gen Z women for Data Science positions. At present there is a lack of employees with Data Science skills and demand for these skills is rising. A talent pool of tech-savvy individuals who are also knowledgeable in Data Science performs the majority of technology work in general and Data Science tasks in particular. It is strongly advised that enterprises take advantage of this chance to also balance the makeup of the workforce working in technology roles by conducting hiring campaigns with a focus on diversity hiring in order to close the demand–supply imbalance for Data Science skills. To encourage more Gen Z women to apply for technology jobs with a focus on Data Science occupations, organisations should rethink their hiring approach and procedure. By supporting a focus on hiring Gen Z women talent, recruiting drives give businesses a wonderful platform and chance to demonstrate their beliefs and commitment to diversity and inclusivity. This will strengthen the organisation's brand and help it draw top talent, particularly Gen Z women. Large companies such as

IBM, Infosys, TCS, Cognizant, Accenture, Cap Gemini, and others have made it a point to hire a particular percentage of their annual employees from diverse backgrounds. They have established a procedure for hiring Gen Z women both directly from campus drives and indirectly from marketplaces. This also leads to creating a digital brand for the organisation, and as a result, organisations are able to attract more Gen Z, especially Gen Z women talent, to the organisation.

Compensation and recognition

Organisations are recommended to create a fair and equitable compensation structure and eliminate any discrimination towards Gen Z women taking up careers in Data Science. Organisations should maintain compensation parity without any gender bias. It is recommended that special measures be taken to recognise Gen Z women who are taking up roles in Data Science. Open recognition would help to motivate more Gen Z women to take up Data Science as a career. Data Science is a relevantly new field and there is a demand for Data Science skills globally. Gen Z women who already have Data Science skills should be encouraged to take up leadership roles. Gen Z women who are new or now aspiring to get into Data Science field should be encouraged by providing mentoring and coaching. Organizations can make efforts to create role models among the Gen Z women working in Data Science by promoting them and offering key assignments and projects. They should be offered opportunities to showcase their talent. Organisations should define policies to fast track their careers by offering timely and merit-based progressions and encouraging more Gen Z women to opt for careers in Data Science.

Work environment

Organisations need to create an inclusive and conducive work environment that encourages a diversified workforce. The development of skills and workplace support techniques are crucial for Gen Z women's career advancement. As per the research findings of Fitong Ketchiwou et al. (2022), women's skill development is influenced by workplace support strategies. The development of skills and workplace support techniques are crucial for Gen Z women's career advancement. Organisations need to take up measures that will help to create a conducive work environment for Gen Z women. There is need to break existing biases against women taking up careers in technology field and Data Science. Organisations should make efforts to break these biases and help create a conducive work environment for Gen Z women to succeed in Data Science. In an academic batch there are about 1000 students pursuing engineering education under various specialisations. Among a batch of engineering students, there is about 35% of women pursuing engineering. While choosing a career option during placements in the IT industry, they prefer to take up roles such as business analyst and project management and few opt for hardcore technology roles that involve development and coding. Hiring managers have delivery targets to achieve and believe that men are

more suited to work late hours and stretch beyond regular working hours to ensure project delivery. They prefer to choose men over Gen Z women. They feel that Gen Z women would have limitations in working later or over weekends and may not stretch beyond regular working hours. The race to succeed in this cutthroat competition in the market has set in some practices and beliefs among organizations and hiring managers that now needs to be changed. Organisations should develop hiring targets to ensure diversity among the workforce. Most of the job opportunities in the organizations are at the entry-level, and there is good scope for managers to hire Gen Z women to build a career in an emerging field such as Data Science. To ensure that hiring managers do not carry any biases and also to encourage more Gen Z women to take up careers in Data Science, management should redefine work policies that will help create a healthy work environment for Gen Z women employees who are trying to build their careers as they graduate out of college. People managers following best practices should be recognised and their practices should be institutionalised to be followed across the organization. Organisations should provide support in every possible form that may be required by Gen Z women if they are expected to work beyond normal hours, such as providing a secured pick-up and drop facility, which is also now mandated by statute. Organisations have provisions such as restrooms for women employees, food provisions for employees working late and compensatory off should be provided for working on weekly offs or over the weekends. These practices should be followed in spirit, which will give a sense of security to Gen Z women and encourage them to take up roles that require them to stretch and work beyond normal working hours. A fair opportunity should be given to Gen Z women employees to demonstrate their capabilities and knowledge without stereotyping them. Managers should hold awareness sessions to discuss the advantages of employing a diverse workforce. They should discuss the advantages each of the teams and organisations would derive by engaging a diverse workforce. A focused attempt to change mindsets should be taken up to create a healthy and conducive work environment by organisations. Organisations should fund events to mentor Gen Z women to create awareness about the field of Data Science among them. They should promote campaigns and events to publicise the prospects of working in Data Science.

Limitations and future directions

This section outlines some of the research's limitations and offers suggestions for other researchers. Firstly, the purposive sampling method may introduce biases, causing participants to report their emotions more correctly than they actually felt. Secondly, a wider sample of Gen Z professionals in the technology sector from other regions and continents might be taken into consideration.

A longitudinal strategy rather than a cross-sectional investigation may yield more reliable results. Therefore,

further longitudinal research must be carried out, which could produce more conclusive results. Additionally, further research can replicate our findings by exploring other variables or factors that may influence the career decision-making of Gen Z women. The other population segments can also be studied and aspects influencing their career choice may also be examined. Furthermore, certain demographic variables may have altered judgements on the career decisions of Gen Z women aspiring to work in Data Science and those already working in Data Science.

Acknowledgements

The participants of the survey, who were selected from a variety of Gen Z women studying in technology institutes across India and from Gen Z women working in Data Science, are all thanked by the authors for devoting their significant time and effort in filling out the questionnaire. The authors are grateful to them for their insightful comments as well. The authors have expressed their gratitude towards the training and placement officers of the institutes for supporting them by familiarising the questionnaire among the Gen Z women students in the institutes. The authors have also acknowledged the efforts made by professionals and human resource (HR) managers whilst circulating the questionnaire among Gen Z women working in different organisations. The insights and experiences shared by both the training and placement officers and HR managers about Gen Z women talent have been adopted for the study. The authors have thanked them for sharing their valuable inputs.

Competing interests

The author(s) declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

The authors collaborated to obtain the information and wrote the article. In order to get feedback from Gen Z women who are studying or working in Data Science domain, they have leveraged their professional and personal network in corporate and academics. They have successfully collaborated with a wide range of technology institutions and organisations. Dr Poornima Tapas oversaw the compilation of this work for publication and made significant contributions to arrange the content along with the primary author.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Funding information

There was no specific grant for this research from any funding organisation in the public, private or non-profit sectors.

Data availability

Data that support the findings of this study are available upon reasonable request from the corresponding author, M.B.

Disclaimer

The views and opinions in this article are those of the writers and may not represent the official stance or policy of any organization to which the authors or the publisher are affiliated.

References

- Barta, T., Kleiner, M., & Neumann, T. (2012). Is there a payoff from top-team diversity? *McKinsey Quarterly*, 2, 13–15.
- Berkup, S.B. (2014). Working with generations X and Y in generation Z period: Management of different generations in business life. *Mediterranean Journal of Social Sciences*, 5(19), 218. <https://doi.org/10.5901/mjss.2014.v5n19p218>
- Berman, F.D., & Bourne, P.E. (2015). Let's make gender diversity in data science a priority right from the start. *PLoS Biology*, 13(7), 1–5. <https://doi.org/10.1371/journal.pbio.1002206>
- Brodie, M.L. (2019). What Is Data Science? In M. Braschler, T. Stadelmann, & K. Stockinger (Eds.), *Applied Data Science: Lessons Learned for the Data-Driven Business* (pp. 101–130). Springer International Publishing.
- Burton, C.M., Mayhall, C., Cross, J., & Patterson, P. (2019). Critical elements for multigenerational teams: A systematic review. *Team Performance Management*, 25(7/8), 369–401. <https://doi.org/10.1108/TPM-12-2018-0075>
- Cavero-Rubio, J.A., Collazo-Mazón, A., & Amorós-Martínez, A. (2019). Public recognition of gender equality in the workplace and its influence on firms' performance. *Women's Studies International Forum*, 76(June), 102273. <https://doi.org/10.1016/j.wsif.2019.102273>
- Chang, E.H., & Milkman, K.L. (2020). Improving decisions that affect gender equality in the workplace. *Organizational Dynamics*, 49(1), 100709. <https://doi.org/10.1016/j.orgdyn.2019.03.002>
- Education Committee on STEM, & National Science and Technology Council. (2013). *Federal Science, Technology, Engineering, and Mathematics (Stem) education 5-Year Strategic plan* (p. 143). Executive Office of the President National Science and Technology Council. Retrieved from https://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf
- Emerson, R.W. (2021). Convenience sampling reference paper, *Journal of Visual Impairment & Blindness*, 115(1), 76+. <https://doi.org/10.1177/0145482X20987707>
- Fitong Ketchiwou, G., Naong, M.N., Van der Walt, F., & Dzansi, L.W. (2022). Investigating the relationship between selected Organizational factors and women's skills development aspirations and career progression: A South African case study. *SA Journal of Human Resource Management*, 20, 1–10. <https://doi.org/10.4102/sajhrm.v20i0.1958>
- Gregory, T. (2021). Discussion. *IZA Inst of Labor Economics Report* (p. 21). Retrieved from <https://ssrn.com/abstract=3900888>
- Hammond, L.S., & Coetzee, M. (2022). An exploration of factors influencing the retention of senior female employees in a financial services organization. *SA Journal of Human Resource Management*, 20, 1–10. <https://doi.org/10.4102/sajhrm.v20i0.1997>
- Hewlett, S.A., Marshall, M., & Sherbin, L. (2013). How diversity can drive innovation. *Harvard Business Review*, 91(12), 30.
- Iorgulescu, M.C. (2016). Generation Z and its perception of work. *Cross-Cultural Management Journal*, 18(01), 47–54.
- Kelleher, J. D., & Tierney, B. (2018). *Data science*. MIT Press.
- Lu, Y. (2017). Industry 4.0: A survey on technologies, applications and open research issues. *Journal of Industrial Information Integration*, 6, 1–10. <https://doi.org/10.1016/j.jii.2017.04.005>
- Maloni, M., Hiatt, M.S., & Campbell, S. (2019). Understanding the work values of Gen Z business students. *International Journal of Management Education*, 17(3), 100320. <https://doi.org/10.1016/j.ijme.2019.100320>
- Moore, K., Jones, C., & Frazier, R.S. (2017). Engineering education for generation Z. *American Journal of Engineering Education (AJEE)*, 8(2), 111–126. <https://doi.org/10.19030/ajee.v8i2.10067>
- NASSCOM. (2020). *FutureSkills talent in India: Demand-Supply analysis* (p. 42). Retrieved from https://nasscom.in/system/files/secure-pdf/DRAUP_Nasscom_India-Technology-Skills-Demand-Supply-Analysis-16-Oct-2020-Final.pdf
- National Science Board. (2014). *Science and engineering labor force* (pp. 1–66). Science and Engineering Indicators.
- Ozkan, M., & Solmaz, B. (2015). The changing face of the employees – Generation Z and their perceptions of work. *Procedia Economics and Finance*, 26, 476–483. [https://doi.org/10.1016/S2212-5671\(15\)00876-X](https://doi.org/10.1016/S2212-5671(15)00876-X)
- Pandita, D. (2021). Innovation in talent management practices: creating an innovative employer branding strategy to attract generation Z. *International Journal of Innovation Science*, 14(3/4), 556–569. <https://doi.org/10.1108/IJIS-10-2020-0217>
- Prawitasari, G. (2018). The influence of generations on career choice (Social Cognitive Career Theory Perspective). *Konselor*, 7(1), 15–20. <https://doi.org/10.24036/02018718464-0-00>
- Shatto, B., & Erwin, K. (2017). Teaching millennials and generation Z: Bridging the generational divide. *Creative Nursing*, 23(1), 24–28. <https://doi.org/10.1891/1078-4535.23.1.24>
- Sidorcuka, I., & Chesnovicka, A. (2017, September). Methods of attraction and retention of generation Z staff. In *CBU International Conference Proceedings* Retrieved March 16, 2022, (Vol. 5, pp. 807–814).
- Strauss, W., & Howe, N. (1991). *Generations: The history of America's future, 1584–2089*. Quill William Morrow.