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EMPOWERING TOMORROW'S ENGINEERS: A CASE STUDY ON THE SURGE IN FEMALE ENROLMENT IN DIPLOMA ENGINEERING PROGRAMS IN ODISHA

Education

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ABSTRACT

This case study delves into the remarkable and transformative trend of increasing enrolment of female students in diploma engineering courses within the state of Odisha, India. As the gender landscape of STEM education evolves, this research explores the factors contributing to the rise in female participation, including government initiatives, societal shifts, and educational reforms. By analysing enrolment data, conducting interviews, and surveying stakeholders, the study uncovers the challenges and opportunities of this educational transformation, shedding light on the broader implications for gender equality, workforce diversity, and the empowerment of women in the field of engineering. This research offers valuable insights for policymakers, educators, and institutions seeking to promote inclusivity and diversity in technical education.

KEYWORDS

Gender Enrolment, Diploma Engineering, Female Participation, Empowerment, Odisha Education

INTRODUCTION:

In a rapidly evolving world driven by technological advancements, the field of engineering has emerged as a pivotal force shaping our future. Yet, for decades, it has been predominantly male-dominated, with women underrepresented in engineering programs and professions. The tide, however, is turning, and a remarkable transformation is underway. This case study, titled "Empowering Tomorrow's Engineers: A Case Study on the Surge in Female Enrolment in Diploma Engineering Programs in Odisha," delves into this compelling phenomenon and its implications.

Within the Indian state of Odisha, a significant shift is taking place as a growing number of female students are choosing to pursue diploma engineering programs. This shift is not only indicative of a broader societal change but also reflects a conscious effort to bridge gender gaps in STEM education.

The purpose of this case study is to comprehensively understand the factors behind this surge in female enrolment in diploma engineering courses. By analysing enrolment data, conducting interviews with students, educators, and policymakers, and surveying various stakeholders, this research aims to unveil the multifaceted influences driving this transformation.

Furthermore, this study delves into the potential ramifications of this educational shift. Beyond promoting gender equality, the rise in female participation in engineering holds promise for increasing workforce diversity and empowering women to take on a more prominent role in shaping the technical and industrial landscape. The findings of this study can serve as a valuable resource for policymakers, educators, and institutions striving to create environments that foster inclusivity and diversity in engineering.

As we embark on a journey to empower tomorrow's engineers, this case study illuminates the significance of this transformation and the promising future it holds for a more equitable, diverse, and innovative engineering landscape.

Rationale For The Study:

The surge in female enrolment in diploma engineering programs in Odisha is a phenomenon of great significance and deserves an in-depth examination for several compelling reasons:

Addressing Gender Disparities:

Historically, the field of engineering has been marked by a stark gender imbalance. This case study is driven by the pressing need to address and rectify these disparities. By understanding the factors behind the increase in female enrolment, we can devise strategies to foster a more inclusive and equitable educational landscape.

Promoting Diversity in STEM:

Gender diversity in STEM fields is not just an issue of social justice but a strategic imperative. Diverse teams are known to foster innovation and bring a broader range of perspectives to problem-solving. An increase in female participation in engineering can enrich the field, making it more reflective of the society it serves.

Empowering Women:

A surge in female enrolment is not merely about enrolment numbers; it's about empowering women. Engineering education equips students with skills to solve real-world problems, and by encouraging more women to pursue these programs, we can empower them to take on leading roles in addressing the technological challenges of the future.

Policy Implications:

Understanding the factors contributing to this trend has critical policy implications. Governments and educational institutions can learn from the experiences in Odisha to implement effective policies and initiatives that promote gender inclusivity in engineering education on a broader scale.

Economic And Industrial Impacts:

The success of industries and economies is closely tied to their technological and engineering capabilities. A more diverse engineering workforce can lead to a broader range of innovations and solutions, potentially boosting economic and industrial growth.

In summary, this case study is motivated by a profound societal need to understand and support the increase in female enrolment in diploma engineering programs in Odisha. By examining the driving factors, we can work towards a more inclusive, diverse, and empowered future in the field of engineering and STEM education.

Objective Of The Study:

To Analyse the Factors Driving the Surge in Female Enrolment: The primary objective of this study is to identify and understand the key factors contributing to the significant increase in female enrolment in diploma engineering programs within Odisha. This involves examining the role of government initiatives, changes in societal perceptions, and educational reforms.

Research Approach:

- This case study employed a mixed-methods research approach, combining both qualitative and quantitative data collection and analysis methods. This approach allows for a comprehensive understanding of the factors driving the surge in female enrolment in diploma engineering programs in Odisha.

Data Collection:

a. Quantitative Data Collection:

-Enrolment Data Analysis: Historical enrolment data from diploma engineering programs in Odisha collected and analysed to identify trends and changes over time.

- Survey Questionnaires: Structured survey questionnaires administered to a representative sample of female students to gather quantitative data on factors such as government initiatives, societal perceptions, and educational reforms.

b. Qualitative Data Collection:

- In-Depth Interviews: Semi-structured interviews conducted with

government officials and educator to get in-depth insights into the role and impact of government initiatives, changes in societal perceptions, and educational reforms.

Sampling:

a. Quantitative Sampling:

- A purposive sampling method used and 110 numbers of female students of Govt. Polytechnic, Dhenkanal of Odisha were selected

b. Qualitative Sampling:

- Key informants, such as government officials and educators of Govt. Polytechnic Dhenkanal purposefully selected for in-depth interviews.

Tool used for quantitative data collection from students:

Title: Empowering Tomorrow's Engineers - Female Enrolment in Diploma Engineering Programs in Odisha.

Introduction:

Thank you for participating in this survey. Your responses will help us better understand the recent increase in female enrolment in diploma engineering programs in Odisha. Your input is valuable in promoting gender diversity in engineering education.

Section 1: Demographics
1.1. Gender: [ ] Male [ ] Female [ ] Other
1.2. Age: _____
1.3. Educational Level: [ ] Current Diploma Engineering Student [ ] Engineering Graduate [ ] other (please specify) _____
1.4. Region: _____

Section 2: Factors Influencing Female Enrolment
2.1. Why do you believe there has been an increase in female enrolment in diploma engineering programs in Odisha? (Select all that apply)
- [ ] Improved awareness and outreach programs
- [ ] Scholarships and financial support
- [ ] Changing societal norms
- [ ] Encouragement from family and peers
- [ ] Positive media representation
- [ ] Other (please specify) _____

Section 3: Educational Experience
3.1. Are you satisfied with the quality of education and support in your engineering program?
- [ ] Very Satisfied
- [ ] Satisfied
- [ ] Neutral
- [ ] Dissatisfied
- [ ] Very Dissatisfied

3.2. Do you think there are enough female role models in your engineering program?
- [ ] Yes
- [ ] No
- [ ] Not Sure

3.3. Have you faced any gender-based discrimination or challenges in your engineering program? (Please describe)

Section 4: Future Career Goals
4.1. What are your career goals upon completing your engineering program?
4.2. Do you believe that there are equal opportunities for both male and female graduates in the engineering job market in Odisha?
- [ ] Yes
- [ ] No
- [ ] Not Sure

Section 5: Suggestions
5.1. What do you think could be done to further encourage female enrolment in engineering programs in Odisha?
5.2. Any other comments or suggestions you would like to provide?

Section 6: Contact Information (Optional)
(Optional) If you are willing to participate in further interviews or discussions, please provide your contact information.
- Name: _____
- Email: _____
- Phone: _____

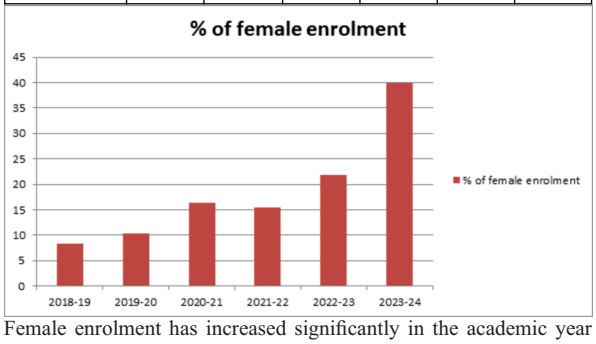
Thank you for participating in our survey! Your input is greatly appreciated and will contribute to our research on empowering female engineers in Odisha.

Data Analysis:

a. Quantitative Data Analysis:

- Enrolment data analysis of Govt. Polytechnic, Dhenkanal

Academic Year	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Total enrolled	178	214	231	259	260	276
Female enrolled(F)	21	41	45	43	57	110
Maximum intake capacity(M)	252	252	276	276	276	276
% of female enrolment= F ——× 100 M	8.33	10.332	16.30	15.57	20.65	39.85



Female enrolment has increased significantly in the academic year 2023-24 to 39.85% which was 8.33% in the academic year 2018-19.The growth between 2022-23 and 2023-24 is 19.2% which is more than other consecutive years.

Survey Questionnaires Analysis:

53.2% of girl students said that they took admission in diploma engineering program for Scholarships and financial support and 18.3% of students voted for improved awareness and outreach programs conducted by institutes. 74% of students are satisfied with facilities provided by institutes and 58% of students are interested to get employed after diploma engineering course and 87% of students don't face any gender discrimination inside the campus.44% of students feel that there are equal opportunities in job market for both gender.

Although there are less numbers of female faculties are available in the institute as compared to male faculties, the students are highly motivated and inspired by them.

Qualitative Data Analysis:

- Semi structured-depth interviews conducted with the officials for finding the reason behind improved enrolment. It found that Odisha state government has started a scheme named Sudakshya for providing financial support to girl's students. The girl's student's admission fees, tution fees and development fees for institutes as well as hostel are free irrespective of annual income of parents. Also they will get 1500 rupees monthly for expenditure of food in hostel and the day scholar students will get 1000 rupees monthly for 10 months.

Also awareness and outreach programs were conducted by the institute with the help of District Education Officer and Block Education Officer in the different high schools. Nearly 50 high schools were visited and the girls from 05 numbers of girl's high schools were invited and brought to the institute for the career counselling. The expenditures for these programs were spent by Govt. of Odisha. Government of Odisha is giving much importance for increase on girl's enrolment in technical education by different schemes.

CONCLUSION:

In this study, we sought to gain valuable insights into the surge in female enrolment in diploma engineering programs in Odisha. The responses from our participants have shed light on the various factors influencing this positive trend and the challenges that female students may encounter during their engineering education.

It is evident that a range of factors, including personal interest in engineering, family support, scholarship opportunities, and the impact of gender diversity initiatives, play significant roles in encouraging female students to pursue diploma engineering programs. Moreover, the presence of female role models within the field of engineering has proven to be a source of inspiration and motivation for aspiring female engineers.

While this study has provided a valuable snapshot of the current state of female enrolment in diploma engineering programs in Odisha, further research and ongoing efforts are essential to maintain and enhance the positive trend observed. By continuing to foster an inclusive, supportive, and inspiring environment for female students, we can empower the engineers of tomorrow and contribute to the growth and diversity of the engineering field in Odisha.

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