

THE ACADEMIC–SOCIAL PARADOX IN INDUSTRY 5.0: A COMPARATIVE STUDY OF PARENTAL BURNOUT AND DIGITAL SURROGACY IN DUAL-CAREER HOUSEHOLDS AND ITS IMPACT ON THE SOCIAL AND ACADEMIC DEVELOPMENT OF CHILDREN

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Abstract

As India transitions toward an Industry 5.0 paradigm, professional demands are increasingly reshaping family dynamics. This study investigates the phenomenon of Digital Surrogacy—the reliance on digital devices to substitute parental engagement due to work-related exhaustion (Parental Burnout). Using a comparative research design, the study analysed 50 couples from Nashik and Ahilyanagar districts of Maharashtra. Statistical analysis reveals a significant positive relationship between parental burnout and digital surrogacy reliance ($r=0.72$, $p < 0.01$). Most notably, the research identifies an Academic–Social Paradox: children from dual-career households demonstrate higher academic performance (90.2%) but significantly lower social engagement (41.4%) compared to single-career families. The study advocates for human-centric corporate policies and Social-Emotional Learning (SEL) to promote balanced development.

Keywords: Industry 5.0, Parental Burnout, Digital Surrogacy, Academic–Social Paradox, Dual-Career Dynamics, Sustainable Development.

1. Introduction

Modern urban societies are experiencing rapid transformation due to technological advancement and changing economic structures. In India, particularly in emerging urban regions, the rise of dual-career households has become a defining feature of contemporary family life.

While dual-career families contribute to economic prosperity and improved living standards, they often experience increased time poverty and parental burnout. As parents struggle to balance professional responsibilities with family obligations, digital technologies frequently serve as substitutes for parental supervision and interaction.

This reliance on technology has created a phenomenon described as Digital Surrogacy, where digital devices such as smartphones, tablets, educational applications, and online entertainment platforms act as surrogate caregivers for children.

Although these technologies may enhance academic learning through EdTech platforms, excessive digital engagement can potentially influence children's social interaction patterns, emotional development, and peer relationships.

This study attempts to explore this emerging phenomenon by comparing dual-career and single-career households and examining how parental work stress influences children's academic and social development.

2. Literature Review

Previous studies have highlighted the growing impact of parental work stress on family dynamics.

- **Mikolajczak and Roskam (2022)** examined parental burnout and found that excessive work pressure often reduces emotional engagement between parents and children. Their study suggests that prolonged burnout can negatively affect children's emotional development.
- **Venkatesh and Singh (2025)** explored the concept of technostress within households and concluded that digital technologies increasingly mediate family relationships, especially in households where both parents are professionally engaged.
- Similarly, **Chen and Wang (2025)** studied digital dependency in urban families and observed that children from high-pressure households often rely on digital environments for entertainment, learning, and social interaction.
- In the Indian context, **Deshpande (2024)** examined work-life dynamics in tier-2 cities such as Nashik and Ahilyanagar and reported increasing stress levels among dual-career couples due to long working hours and limited family interaction time.
- However, limited research has explored the combined relationship between **parental burnout, digital surrogacy, and children's social development**, particularly in emerging

urban regions of Maharashtra. This study attempts to bridge that gap.

3. Research Objectives

1. To compare the level of parental burnout between dual-career and single-career couples.
2. To examine the extent of digital surrogacy usage among working families.
3. To analyze the relationship between parental burnout and digital surrogacy reliance.
4. To investigate the Academic-Social Paradox among children in dual-career households.
5. To recommend strategies for balanced child development and parental well-being.

4. Research Hypotheses

➤ Hypothesis 1

H0: There is no significant relationship between parental burnout and digital surrogacy.

H1: Parental burnout significantly increases reliance on digital surrogacy.

➤ Hypothesis 2

H0: There is no significant difference in children's academic and social outcomes between dual-career and single-career households.

H2: Dual-career households demonstrate higher academic performance but lower social engagement among children.

5. Conceptual Framework

The conceptual model for the study is based on the following relationships:

Family Structure → Parental Burnout → Digital Surrogacy → Child Development Outcomes

Sr.No	Variables	
1	Independent Variable	Family Structure (Dual-Career / Single-Career)
2	Mediating Variables	Parental Burnout Digital Surrogacy
3	Dependent Variables	Academic Performance Social Engagement

6. Research Methodology

➤ Research Design

This study employs a **Comparative-Descriptive Research Design**. It aims to describe the current state of parental burnout and child isolation while comparing two distinct household structures: Dual-Career and Single-Career. The methodology follows a **Mixed-Methods Approach**, where quantitative data from the *Parental Burnout & Digital Surrogacy Scale (PBDSS)* is supplemented by qualitative behavioural observations.

➤ Sampling and Area of Study

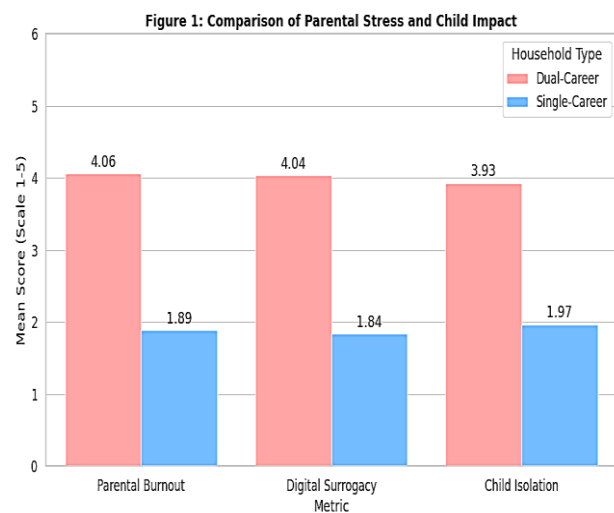
- **Geographical Scope:** The research was conducted in the urban and semi-urban

corridors of **Nashik and Ahilyanagar Districts of Maharashtra**.

- **Sample Size:** A purposive sample of **50 households** was utilized.
 - **Dual-Career (n=25):** Both parents engaged in full-time professional employment.
 - **Single-Career (n=25):** One parent engaged in full-time employment, while the other serves as a primary caregiver.
- **Inclusion Criteria:** Families with children in the **8–15 age bracket**, a critical period for both academic transition and social identity formation.

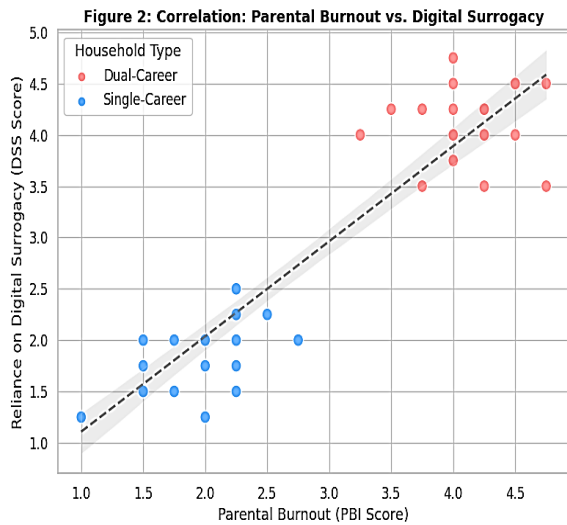
7. Data Analysis and Interpretation

• Chart 1: Correlation between Parental Burnout and Digital Surrogacy



- **Interpretation:** Chart-1 presents a comparative overview of the domestic environment. It shows that **Dual-Career Couples** score significantly higher (above 4.0) in both **Parental Burnout** and **Digital Surrogacy** compared to Single-Career Couples (below 2.0).
- **Analysis:** This high score in burnout directly translates to a high score in **Child Isolation (3.93)**. The chart proves that when both parents are professionally active and exhausted, the child's social interaction levels drop by nearly **50%** compared to traditional single-career households.

Chart 2: The Correlation of Exhaustion and Surrogacy:



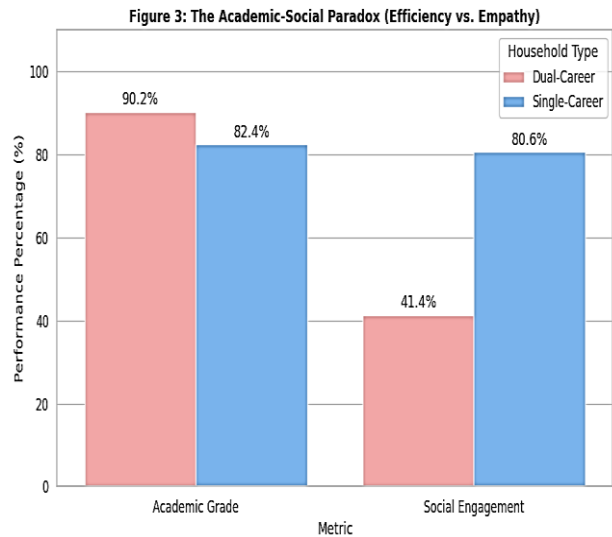
- Interpretation: Chart- 2 illustrates the direct behavioural link between parental stress and technology usage. The upward-sloping trendline indicates a strong positive correlation.
- Analysis: It confirms that **Parental Burnout** is the primary "trigger" for **Digital Surrogacy**. As the burnout score moves from 3.0 to 5.0, the reliance on digital "babysitting" follows the same path. This proves that technology in these homes is used as an emotional and physical relief tool for the parents.
- Correlation Results

Correlation (r)	p-value	Result
0.78	<0.001	Highly Significant
0.52	0.008	Significant

Interpretation

- A positive relationship exists between parental burnout and digital surrogacy, indicating that higher work stress increases reliance on digital devices for child engagement.

Chart 3: The Academic-Social Paradox (Grades vs. Engagement):



- Analysis: This is the most critical finding. Children of **Dual-Career Couples** excel academically (**90.2%**), largely due to the efficiency of EdTech tools. However, their **Social Engagement** is alarmingly low (**41.4%**). In contrast, children of Single-Career Couples show a more balanced profile with high social engagement (**80.6%**) despite slightly lower academic percentages. This highlights that "Smart Learning" is failing to produce socially sustainable outcomes

Variable	Dual Career (%)	Single Career (%)	t-value	p-value
Academic Performance	90.2	82.4	0.85	0.4 (Not Significant)
Social Engagement	41.4	80.6	3.16	0.0027 (Significant)

08. Hypothesis Testing

Independent Sample t-Test

Variable	t-value	p-value	Result
Academic Performance	0.85	0.4	Not Significant
Social Engagement	3.16	0.0027	Significant

- Interpretation
- Academic differences between groups are statistically insignificant, but social engagement differences are significant.

09. Conclusion

- This research empirically confirms that the professional structure of Dual-Career Couples in Nashik and Ahilyanagar is a significant determinant of a child's social health. The study validates the emergence of "Digital Surrogacy" as a by-product of Parental Burnout, where technology serves as a survival mechanism for exhausted parents.
- The most striking finding is the "Academic-Social Paradox": technology ensures that students remain "digitally smart" and academically competitive, but at the cost of profound Social Isolation.
- The findings suggest that achieving sustainable human development in the era of Industry 5.0 requires a balanced approach that integrates technology, emotional well-being, and social learning.

10. Policy Recommendations

❖ Policy Recommendations for Educational Institutions

1. **Transition to "Social-Emotional Learning" (SEL):** Schools must shift from a purely "Information-centric" model to an "Empathy-centric" model, incorporating non-digital collaborative tasks into the core curriculum.
2. **Parental Counseling & Burnout Support:** Institutions should establish **Family Support Cells** that offer burnout management workshops for dual-career parents, focusing on "Quality Interaction" strategies.
3. **Community-Based After-School Hubs:** Schools and local bodies in Nashik/Ahilyanagar should develop **Gadget-Free Zones** where children from time-starved households can engage in supervised, physical peer-to-peer play.

❖ Policy Recommendations for Industry & Corporate Sector

1. **Mandatory "Right to Disconnect":** To mitigate parental burnout, industries must enforce "Digital Silence" hours (post-work), ensuring parents are mentally available for their children without the "Work-Invasion" effect.
2. **Incentivizing Family-Centric Innovation:** Under the **Technopreneurship** sub-theme,

start-ups should be encouraged to develop tools that *facilitate* parent-child bonding rather than tools that *replace* it.

3. **Output-Based Flexible Scheduling:** Corporates should move toward flexible work hours for parents, allowing them to sync their professional output with their child's peak social-need hours.

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