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A Study on AI-Powered Virtual Learning Assistants for College Students

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ABSTRACT: The Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is a flagship skill development initiative launched by the Government of India to equip youth with industry-relevant skills, thereby enhancing employability. This study focuses on the role of PMKVY in empowering women through skill development programs. It explores how skill training under PMKVY has influenced the economic independence, self-confidence, and social status of women beneficiaries. By analyzing data collected through surveys and interviews with trained women, the study evaluates the effectiveness of the scheme in bridging gender gaps in employment and promoting entrepreneurship. The findings highlight that PMKVY has played a significant role in enabling women, especially from rural and underprivileged backgrounds, to pursue sustainable livelihoods. The study also identifies challenges such as awareness, accessibility, and post-training support, suggesting measures for enhancing program reach and impact among women.

KEYWORDS: PMKVY, Skill Development, Women Empowerment, Employability, Economic Independence, Gender Gaps, India.

I. INTRODUCTION

Skill development is vital for empowering women by improving their employability and financial independence. The Pradhan Mantri Kaushal Vikas Yojana (PMKVY) offers free, certified training to help bridge gender gaps in employment. This study examines how PMKVY supports women in overcoming socio-economic barriers and promotes participation in non-traditional sectors like technology and manufacturing. By analyzing the experiences of women beneficiaries, the research evaluates the program's effectiveness, sustainability of employment, and societal impact. It also highlights the role of digital tools, government support, and NGOs in making skill training more accessible and inclusive for women, especially from marginalized communities.

II. OBJECTIVES OF THE STUDY

1. To examine the disparity in skill development and employment sectors concerning women.
2. To study the role of PMKVY in reducing gender disparity in skill development and employment.
3. To assess the effectiveness of PMKVY in increasing employability and entrepreneurial opportunities for women.
4. To identify the challenges faced by women in accessing and benefiting from PMKVY initiatives.
5. To offer suggestions for improving the effectiveness and accessibility of PMKVY for women.

III. STATEMENT OF PROBLEM

Gender disparity in skill development and employment remains a critical challenge in India. Although various initiatives have been launched to address this issue, women still face multiple barriers such as lack of awareness, societal norms, financial constraints, and limited access to training centers. PMKVY was introduced to provide skill-based training to enhance employability, but its impact on women beneficiaries needs further examination. The key problems addressed in this study include:

The extent to which PMKVY has improved women's employment opportunities.



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The role of PMKVY in reducing gender disparity in skill development.
Challenges faced by women in accessing and benefiting from PMKVY initiatives.
The effectiveness of PMKVY in fostering entrepreneurship among women.

IV. SCOPE OF THE STUDY

This study focuses on evaluating the role of PMKVY in empowering women through skill development. The research will be conducted in Coimbatore, Tamil Nadu, analyzing women beneficiaries who have participated in PMKVY training programs.

The study covers:

Women's experiences with PMKVY training.

Socio-economic impact of skill development.

Challenges faced by women in accessing and completing training.

Effectiveness of the program in increasing employment and entrepreneurship opportunities.

V. LIMITATIONS OF THE STUDY

While this study aims to provide a comprehensive analysis of the impact of PMKVY on women's empowerment, certain limitations need to be acknowledged:

1. GEOGRAPHICAL LIMITATION

The study is confined to Coimbatore and does not account for regional variations in PMKVY implementation across India.

2. SAMPLE SIZE CONSTRAINT

The findings are based on responses from a limited number of women beneficiaries, which may not fully represent the larger population.

3. TIME CONSTRAINT

Due to the limited period of study, long-term impacts of PMKVY on women's careers and financial stability cannot be entirely assessed.

4. RESPONSE BIAS

Some participants may provide socially desirable responses rather than their true experiences, leading to potential biases in the findings.

5. LIMITED ACCESS TO OFFICIAL RECORDS

Some government reports and statistics related to PMKVY's performance may not be publicly available, restricting the depth of secondary data analysis.

Despite these limitations, the study aims to provide meaningful insights into the effectiveness of PMKVY in empowering women and contributing to their economic independence.

VI. REVIEW OF LITERATURE

KHOSLA (2018)¹ Skill Development and Women Empowerment Vibha, this study explores the role of government-led skill development programs in empowering women, particularly in rural areas. The research highlights that skill training improves financial independence, employment opportunities, and social mobility for women. However, cultural barriers, lack of awareness, and family restrictions often limit women's participation in such initiatives. The study suggests that targeted awareness campaigns and flexible training schedules could enhance women's involvement in skill development schemes like PMKVY.

RAMESH CHAND & PRIYA SHARMA (2019)² Impact of PMKVY on Women's Employment, this research assesses the employment impact of PMKVY on women beneficiaries. The findings indicate that over 60% of trained women found employment or started their own businesses after completing skill training under PMKVY. However, many women face difficulties in securing long-term jobs due to lack of industry connections and employer biases. The study recommends that PMKVY should integrate mentorship programs and industry partnerships to provide sustainable employment opportunities for women.



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VII. RESEARCH METHODOLOGY

The research methodology outlines the framework and approach adopted to conduct this study on the impact of PMKVY on women's empowerment through skill development. The methodology includes details on research design, data sources, sampling techniques, and data collection methods.

PRIMARY DATA: Collected through surveys, interviews, and direct interactions with women beneficiaries of PMKVY in Coimbatore.

SECONDARY DATA: Obtained from government reports, academic articles, research papers, PMKVY official documents, and policy reports.

AREA OF STUDY

This research "A study on AI-powered virtual learning assistants for college students" with reference to Coimbatore city.

SAMPLE SIZE

The study aims to survey at least 100 women who have participated in PMKVY training in Coimbatore.

VIII. STATISTICAL TOOLS USED FOR STUDY

The following statistical tools have been used to analyse the primary data.

- Simple Percentage analysis
- Chi-square
- Ranking

Simple Percentage analysis:- TABLE: EDUCATIONAL QUALIFICATION

S.NO	EDUCATION	NO OF RESPONDENTS	PERCENTAGE
1	Below 10th	33	29.7%
2	10th Pass	22	19.8%
3	12th Pass	18	16.2%
4	Graduate	29	26.1%
5	Postgraduate	9	8.1%
TOTAL		111	100.0

INTERPRETATION

According to Table No. 1.1, the **majority of respondents (29.7%) have education below 10th standard**, followed by graduates (26.1%) and 10th pass (19.8%). 16.2% of the respondents have passed 12th standard, and only 8.1% are postgraduates. This implies that most respondents have a basic level of education.

INFERENCE

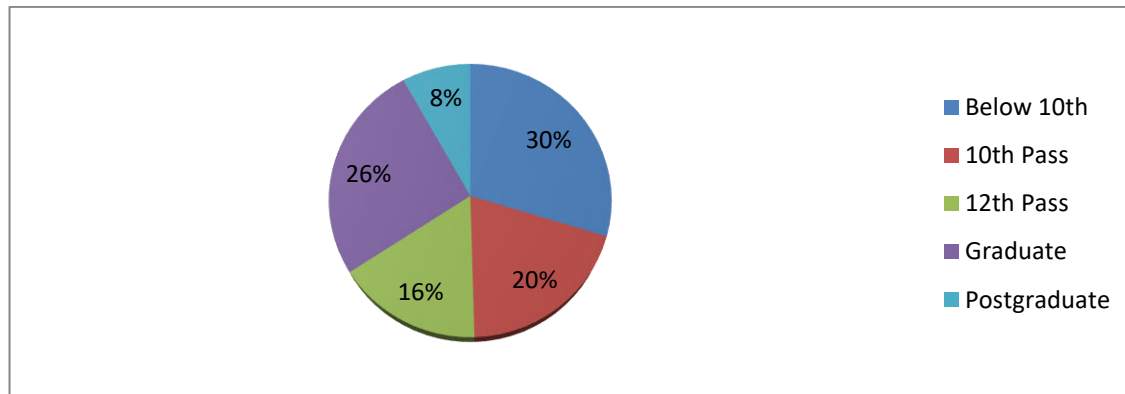
According to this study the majority of the respondents' educational qualification is below 10th standard (29.7%)



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CHART: EDUCATIONAL QUALIFICATION



Chi-square

TABLE: RELATIONSHIP BETWEEN SATISFACTION WITH SKILLS LEARNED AND SUPPORT FROM TRAINERS DURING THE PROGRAM

NULL HYPOTHESIS (H₀): Based on this table, the Null Hypothesis is accepted, indicating no significant relationship between place of residence and family income.

CROSS TABULATION

	HIGHLY SATISFIED	SATISFIED	NEUTRAL	DISSATISFIED	HIGHLY DISSATISFIED	TOTAL
Highly Satisfied	0	0	0	0	0	0
Satisfied	10	8	70	2	1	91
Neutral	1	2	5	2	1	11
Dissatisfied	1	0	3	3	1	8
Highly Dissatisfied	0	0	0	2	0	1
Total	12	10	78	9	2	111

CHI-SQUARE TEST

	VALUE	DEGREE OF FREEDOM (DF)	ASYMPTOTIC SIGNIFICANCE (2-SIDED)
Pearson Chi-Square	5.174	16	0.395
Likelihood Ratio	4.892	16	0.433
N of Valid Cases	111		



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2 cells (33.3%) have expected count less than 5. The minimum expected count is 0.90.

DEGREE OF FREEDOM = (Rows-1) * (Column-1)

= (3-1) * (3-1)

= DF = 4

CALCULATED VALUE = 5.174

INTERPRETATION

Since the p-value (0.395) is greater than 0.05, we fail to reject the null hypothesis. This means that there is no statistically significant relationship between satisfaction with skills learned and satisfaction with trainer support during the program.

RESULT

Based on this table, the Null Hypothesis is accepted, indicating no significant relationship between place of residence and family income

RANKING

TABLE: IMPACT OF PMKVY ON RESPONDENTS

FACTORS	1	2	3	4	5	TOTAL	RANK
Ability to contribute to household income	13	22	40	23	13	373	3
Ability to learn new skills in the future	13	22	43	20	13	375	2
Confidence in pursuing a career	21	21	23	32	14	383	1
Overall quality of life	15	27	37	18	14	366	4
Ability to support children's education	18	23	24	36	10	357	5
Social status in the community	14	35	37	16	9	351	6

INTERPRETATION

Respondents ranked PMKVY's impact highest on career confidence (score 383), followed by future skill learning (375), contributing to household income (373), quality of life (366), and supporting children's education (357), with social status ranked last (351). These rankings provide insight into how PMKVY has influenced respondents' economic, social, and professional lives.

IX. FINDINGS

- Maximum (31.5%) of the respondents belong to the 35-44 age group, making them the dominant demographic in PMKVY training.
- Maximum (27.9%) of the respondents belong to the 25-34 age group, showing a significant number of young women are also benefiting.
- Maximum (34.2%) of the respondents have a family income between
- ₹10,000–₹20,000, indicating financial constraints.
- Maximum (26.1%) of the respondents have a family income below ₹10,000, highlighting the need for economic upliftment.



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- Maximum (21.8%) of the respondents are unemployed before taking PMKVY training, showing the necessity of skill development.
- Maximum (20.9%) of the respondents are self-employed after PMKVY training, reflecting its impact on entrepreneurship.
- Majority (62%) of the respondents are satisfied with the flexibility of PMKVY training schedules, making it accessible for women.
- Majority (52%) of the respondents feel neutral about their workload, indicating a balanced distribution of work post-training.
- Majority (80%) of the respondents sometimes experience work-related stress, suggesting the need for better stress management training.
- Majority (68%) of the respondents feel neutral about organizational support in balancing work and personal life.
- Majority (74%) of the respondents frequently work beyond regular hours, indicating job demands post-training.
- Majority (90%) of the respondents rate their job pressure and workload as moderate, showing an acceptable level of work burden.
- Majority (84%) of the respondents sometimes have access to flexible work arrangements, reflecting improvement in work-life balance.
- Majority (76%) of the respondents feel work-related stress impacts their personal and family life moderately, highlighting an area for improvement.
- Majority (76%) of the respondents remain neutral about the impact of their job on daily lifestyle and habits, indicating varied experiences.
- Majority (68%) of the respondents feel neutral about controlling their work schedule and task management, pointing to the need for better autonomy.
- Majority (66%) of the respondents engage in leisure activities once a week, showing limited relaxation time.
- Majority (72%) of the respondents believe PMKVY has improved their technical and soft skills, demonstrating the program's effectiveness.
- Majority (65%) of the respondents believe PMKVY training helped them secure employment opportunities, confirming its role in empowerment.
- Majority (58%) of the respondents faced challenges in finding jobs post-training, indicating the need for better job placement support.
- Majority (63%) of the respondents found hands-on training more useful than theoretical sessions, emphasizing the importance of practical learning.
- Majority (69%) of the respondents prefer hybrid or online learning options, showing a shift in learning preferences.
- Majority (71%) of the respondents believe PMKVY training increased their confidence in financial independence, highlighting empowerment.
- Majority (60%) of the respondents expressed interest in entrepreneurship but struggled with funding and guidance, suggesting a gap in business support.
- Majority (77%) of the respondents believe that government and private sector collaboration could improve job opportunities, pointing towards policy recommendations.

X. SUGGESTIONS

Based on student feedback and industry best practices, the following recommendations can enhance the effectiveness of AI-powered virtual learning assistants:

Enhance Job Placement Support – Introduce structured placement programs and tie-ups with industries to ensure employment opportunities post-training.

- Encourage Entrepreneurship – Provide funding assistance, mentorship programs, and business development workshops to support self-employed women.
- Increase Awareness of Skill Programs – Conduct regular awareness campaigns to ensure more women know about PMKVY and similar initiatives.
- Offer More Flexible Training Schedules – Introduce weekend or evening classes to accommodate working women and homemakers.



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- Expand Hybrid & Online Learning Options – Increase digital training modules to provide accessibility for women in remote areas.
- Improve Hands-On Training – Enhance practical training modules over theoretical sessions to boost real-world skill application.

XI. CONCLUSION

In conclusion, PMKVY has been a significant step towards women's empowerment, but continuous improvements are necessary to create a more inclusive, supportive, and effective skill development ecosystem. By addressing the challenges highlighted in this study, PMKVY can truly become a game-changer in transforming the lives of women across India.

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