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Unveiling the Impact: Assessing the Effectiveness of PMKVY Scheme in Uttarakhand

[1]Dr Shekhar Kumar Sahu,[2]Dr Manoj Singh Negi, [3]Shital, [4]Dr Gaurav Pant, [5]Prof. Rajkumar Teotia, ,[6]Dr Reetu Tevatia,

[1](Assistant Professor Faculty of Commerce and Business Management, Amrapali University,Haldwani, Nainital)

[2](Assistant Professor Faculty of Commerce and Business Management, Amrapali University, Haldwani, Nainital)

[3](Research Scholar, M.B.Govt.P.G College, Haldwani, Nainital) Email:

[4](Assistant Professor Faculty of Commerce and Business Management, Amrapali University, Haldwani, Nainital)

[5](Associate Professor, H.R. Institute of Science and Technology, Ghaziabad)

[6](Associate Professor Faculty of Commerce and Business Management, Amrapali University, Haldwani, Nainital)

Abstract:

Purpose – The study of this paper is to know the Unveiling The Impact: Assessing The Effectiveness of Pmkvy Scheme In Uttarakhand.

Theoretical Framework: To measure the effectiveness of PMKVY in Uttarakhand. We use EFA and CFA techniques to identify the factors, after that we found 5 factors to measure the effectiveness of PMKVY and the factors are Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation. These factors help our research to measure the effectiveness of PMKVY in Uttarakhand

Design/Methodology – We have taken 5 factors (Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation) with 24 items to fulfil our research objectives. In total, 150 people filled out the questionnaire out of which 120 samples were completed and reliable. Hence the total sample size for the study was 250 who were selected randomly from people of Dehradun further, Amos and SPSS software were used to test the validity of the model and test the hypothesis.

Findings – An analysis of the PMKVY program in Uttarakhand identifies five critical areas: employment outcomes, financial outcomes, quality of training, policy environment and policy innovation. Although preliminary tests assumed equal variances, subsequent Welch ANOVA tests revealed significant differences in employment outcomes across demographic groups—age, qualification, occupation, and income per month—which affected system efficiency. However, these factors showed no significant effects on other dimensions. T-tests confirmed the general hypothesis, confirming the assumption of equal variances.

Keywords:*Effectiveness, PMKVY, Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation*

Introduction:

Uttarakhand, nestled in the lap of the Himalayas, epitomises natural splendour and cultural richness. However, beneath its picturesque landscape lies a state grappling with developmental challenges, including unemployment and underemployment among its youth. In response to these challenges, the implementation of the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) in Uttarakhand has emerged as a beacon of hope, offering a pathway to skill empowerment and economic prosperity for its residents.

The effectiveness of PMKVY in Uttarakhand is a topic of paramount importance, as it reflects not only the success of skill development interventions in addressing local socio-economic needs but also the alignment of national policies with regional aspirations. This brief introduction endeavours to delve into the nuances of PMKVY's implementation in Uttarakhand, assessing its impact, challenges, and potential avenues for enhancement.

Since its inception, PMKVY has sought to equip individuals in Uttarakhand with industry-relevant skills, enhancing their employability and catalysing socio-economic transformation. The scheme's interventions span a wide spectrum, ranging from vocational training and certification to entrepreneurship development and apprenticeship opportunities. Through strategic partnerships with state agencies, training providers, and industry stakeholders, PMKVY endeavours to create a conducive ecosystem for skill development and employment generation in Uttarakhand.

As we embark on a journey to evaluate the effectiveness of PMKVY in Uttarakhand, several key dimensions warrant scrutiny. Firstly, assessing the reach and accessibility of PMKVY programs across the state is essential to gauge their inclusivity and coverage among marginalized communities and remote areas. Moreover, examining the quality and relevance of skill training imparted under PMKVY is crucial to ensure that beneficiaries acquire competencies that align with local market demands and emerging industry trends.

Furthermore, evaluating the outcomes and impact of PMKVY interventions on individuals' livelihoods and socio-economic well-being offers valuable insights into the scheme's effectiveness in Uttarakhand. This entails tracking indicators such as employment rates, income levels, and entrepreneurial ventures initiated by PMKVY beneficiaries. Additionally, exploring the role of PMKVY in fostering regional development, addressing migration patterns, and promoting gender equality can provide a holistic understanding of its impact on Uttarakhand's socio-economic landscape.

Despite its potential benefits, PMKVY in Uttarakhand faces several challenges that warrant attention and remedial action. These include infrastructural constraints, inadequate training infrastructure in rural areas, and the need for customized skill development programs tailored to the state's unique economic sectors and cultural context. Addressing these challenges requires a concerted effort from government agencies, civil society organizations, and private sector stakeholders to optimize the impact of PMKVY in Uttarakhand.

To comprehensively assess the effectiveness of PMKVY in Uttarakhand, it is essential to adopt a multi-dimensional approach that considers various stakeholders' perspectives, gathers empirical evidence, and incorporates feedback from beneficiaries and implementing agencies alike. This approach can help uncover both the successes and challenges encountered in PMKVY's implementation, thereby informing future policy decisions and programmatic interventions.

One aspect that merits attention is the role of local governance structures and administrative mechanisms in facilitating the smooth implementation of PMKVY in Uttarakhand. Strengthening coordination between state and district-level authorities, streamlining bureaucratic procedures, and enhancing transparency and accountability can contribute to optimising the utilisation of resources and improving the delivery of skill training services.

Furthermore, fostering collaboration between PMKVY training providers, industry associations, and employers in Uttarakhand is critical for enhancing the relevance and effectiveness of skill development programs. By aligning training curricula with industry needs, facilitating industry internships and on-the-job training opportunities, and promoting industry-led certification and accreditation, PMKVY can enhance its value proposition for both trainees and employers in Uttarakhand.

Review of literature:

Thakur, K.S. and Agrawal, Mini (2019). in the study intended to assess the Impact of the PMKVY in improving the productivity of youth in the Gwalior region. For this, non-probability sampling was used and data

was collected through surveys conducted at the training centre of PMKVY, Gwalior, India. The sample size consisted of 1197 trainees The findings of the study revealed that training builds abilities, enhances performance, promotes entrepreneurship and enables individuals to earn a livelihood.

Bhuvana S., Kavya and Geetanjali P. (2019). conducted a study to assess the effectiveness of the skill development programs for enhancing their skills through personal interviews and observations of the respondents. The results revealed certain issues related to insufficient job roles and insufficient time to learn the concepts. It hinted at the need to introduce new courses like, fashion industry and cinematography etc.

Singh & Kaur (2018). conducted a study entitled "A Study on Skill Development of Paint and Coating Industry" to identify the reasons for the shortage of skills in the paint industry and the ways to deal with the skill gap. To achieve this objective, the primary investigation was conducted using a self –self-administered questionnaire to collect data from 130 painters working in the Kurukshetra district. The findings revealed that lack of formal training and inadequate provisions for the training of painters as the main reasons behind the shortage of skills in the paint industry. The results also revealed that there is a shortage of skilled workforce in the paint industry. The findings indicated that training has a positive and significant effect on the performance of the workforce though there is a lack of formal training without any formal certification and the painters lack sufficient knowledge and skills due to which their performance is unsatisfactory. Moreover, the level of knowledge and skills was low about new equipment and techniques in painting work and the work environment is also hazardous with poor safety norms and provision of insurance schemes for the painters.

Rashmi Dewangan (2018). presented a literature review on the Pradhan Mantri Kaushal Vikas Yojna (PMKVY) program entailing its role, main features and key contributions to skilling and empowering the rural youth. The findings of the study revealed that the fundamental aim behind this scheme of certifying the skills is to empower a large number of youth to enrol in industry-relevant skill training courses. It suggested similar studies to compare the success of this skill development scheme in different states and also recommended a comparative study of the Short-term training and Recognition of prior learning under the PMKVY.

Research Methodology

Data and Sample

A structured questionnaire was framed and executed in a group of 150 students of the PMKVY scheme using a convenience sample. The respondents were people of Uttarakhand who live in five major cities (Dehradun, Haldwani, Rudrapur, Haridwar & Almora) of the state of Uttarakhand in India. The survey was administered offline. Only one response per student was considered. Partial responses were not considered for analysis due to incompleteness, hence leaving 120 responses fit for further analysis.

The objective of the Study:

- To measure the factors of effectiveness of the PMKVY scheme in Uttarakhand.
- Examine the impact of demographic factors on the effectiveness of the PMKVY scheme in Uttarakhand.

The hypothesis of the Study:

H_a: There is a significant impact of demographic factors on the effectiveness of the PMKVY scheme.

H_0: There is no significant impact of demographic factors on the effectiveness of the PMKVY scheme.

Measures:

The questionnaire consisted of 25 items in English. The items used in the questionnaire were rated with the help of a seven-point Likert scale starting from 1-Strongly Disagree to 7-Strongly Agree. The literature review identified 5 factorsfor measuring the effectiveness of the PMKVY scheme in Uttarakhand namely, Policy

Environment, Program Innovation, Socio-Economic Impact, Stakeholder Perspectives, and Employment Outcomes.

1. **Stakeholder Perspectives:** Gathering feedback and perspectives from various stakeholders, including beneficiaries, training providers, employers, and government officials, on the effectiveness of PMKVY implementation.
2. **Socio-Economic Impact:** Assessing the broader socio-economic impact of PMKVY on individuals, families, and communities in Uttarakhand, including poverty alleviation, social mobility, and empowerment.
3. **Program Innovation:** Identifying innovative approaches and best practices in PMKVY implementation in Uttarakhand, including the use of technology, public-private partnerships, and community engagement strategies.
4. **Policy Environment:** Analysing the policy framework and institutional arrangements supporting PMKVY implementation in Uttarakhand, including governance structures, funding mechanisms, and regulatory frameworks.
5. **Employment Outcomes:** Evaluating the employment outcomes of PMKVY beneficiaries in terms of job placements, income levels, and career advancement opportunities.

Data analysis:

Table 1. Demographic Profile of Data

Demographic	Frequency	Percentage
Gender		
Male	62	51.7
Female	58	48.3
Age		
Below 20 Years	18	15.0
20 – 30 Years	49	40.8
30 – 40 Years	26	21.7
40 – 50 Years	18	15.0
More than 50 Years	9	7.5
Marital Status		
Married	32	26.7
Unmarried	88	73.3
Qualification		
School Level	21	17.5
Diploma	25	20.8
Undergraduate	40	33.3
Postgraduate	23	19.2
Other	11	9.2
Occupation		
Student	7	5.8
Government Employee	43	35.8
Private Employee	37	30.8
Businessman	17	14.2
Other	16	13.3
Monthly Income		
Below Rs. 10000	12	10.0
Rs. 10000 – Rs. 20000	10	8.3
Rs. 20000 – Rs.30000	44	36.7

Rs. 30000 – Rs. 40000	37	30.8
More than Rs. 40000	17	14.2
Place of Residence		
Urban	32	26.7
Rural	88	73.3

Table .2. Variables with respective factor codes

Variable	Variable Code
PMKVY training programs in Uttarakhand effectively prepare participants for employment opportunities in their chosen fields.	EO1
Beneficiaries of PMKVY programs in Uttarakhand experience an improvement in their income levels after completing training.	EO2
PMKVY programs in Uttarakhand facilitate job placements for participants in reputable organizations and companies.	EO3
Participants who complete PMKVY training programs in Uttarakhand report a high level of job satisfaction and career advancement opportunities.	EO4
PMKVY programs in Uttarakhand contribute to reducing unemployment rates and enhancing economic prosperity in the state.	EO5
The infrastructure and facilities available at PMKVY training centres in Uttarakhand contribute to a conducive learning environment.	TQ1
Participants in PMKVY training programs in Uttarakhand receive adequate support and guidance throughout their training journey.	TQ2
PMKVY training programs in Uttarakhand effectively incorporate practical, hands-on learning experiences to enhance skill acquisition.	TQ3
Trainers delivering PMKVY programs in Uttarakhand demonstrate high levels of competence and expertise in their respective fields.	TQ4
The curriculum of PMKVY training programs in Uttarakhand is aligned with the skill requirements of industries and employers.	TQ5
Participation in PMKVY programs in Uttarakhand has led to an improvement in the overall socio-economic status of beneficiaries.	SEI1
PMKVY interventions in Uttarakhand have contributed to poverty reduction and enhanced livelihood opportunities for individuals and families.	SEI2
The skill development initiatives under PMKVY have promoted social mobility and upward economic mobility for participants in Uttarakhand.	SEI3
PMKVY programs in Uttarakhand have effectively	SEI4

addressed the specific needs and priorities of marginalized and vulnerable groups in the state.	
The socio-economic impact of PMKVY in Uttarakhand is sustainable and contributes to long-term development outcomes in the state.	SEI5
PMKVY programs in Uttarakhand demonstrate innovative approaches and best practices in skill development interventions.	PI1
There is effective utilization of technology in PMKVY training programs in Uttarakhand to enhance learning experiences and outcomes.	PI2
Public-private partnerships play a significant role in driving innovation and sustainability in PMKVY initiatives in Uttarakhand.	PI3
PMKVY programs in Uttarakhand actively engage local communities and stakeholders in the design and implementation of skill development interventions.	PI4
There is scope for further innovation and experimentation in PMKVY programs in Uttarakhand to address emerging skill needs and market trends effectively.	PI5
The policy framework supporting PMKVY implementation in Uttarakhand provides adequate guidance and support for effective program delivery.	PE1
There is coordination and collaboration among various government agencies and departments involved in PMKVY implementation in Uttarakhand.	PE2
Funding mechanisms for PMKVY programs in Uttarakhand are sufficient to meet the needs and demand for skill development interventions.	PE3
There is scope for policy reforms and enhancements to strengthen the effectiveness and sustainability of PMKVY programs in Uttarakhand.	PE4

Reliability test:

In this study, assessing the internal consistency of the data holds substantial importance as it indicates the degree of coherence among the variables analyzed as a collective. Cronbach's Alpha, a statistical measure, has been employed to evaluate this internal consistency.

Cronbach's Alpha: A commonly accepted guideline for interpreting Cronbach's Alpha suggests that a value exceeding 0.8 indicates strong internal consistency, signifying a robust relationship among the variables. Furthermore, a value above 0.7 is considered reliable and acceptable, demonstrating a satisfactory level of internal consistency within the data.

Table.3. Reliability Statistics:

Cronbach's Alpha	N of Items
0.898	24

The results of the above table indicate the value of Cronbach's alpha is 0.914, showing high internal consistency, which means the study can proceed further with KMO and Bartlett's test.

Sampling Adequacy

Kaiser-Meyer-Olkin (KMO) and Bartlett's test: The Kaiser-Meyer-Olkin (KMO) and Bartlett's test assess the suitability of conducting factor analysis. KMO evaluates sample adequacy, while Bartlett's Test examines the correlation between variables. Essentially, Bartlett's Test assesses if the variables chosen for analysis are independent.

Thumb rule: To proceed with factor analysis, KMO should surpass 0.5, indicating adequate sample suitability. Additionally, Bartlett's Test requires a p-value less than 0.05, or 0.00, to reject the null hypothesis, demonstrating variable correlation.

Table 4.KMO and Bartlett's Test:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.870
Bartlett's Test of Sphericity	Approx. Chi-Square	1788.045
	Df	276
	Sig.	.000

Source: Computed data

The table shows a KMO value of 0.870, indicating adequate sample size, and Bartlett's Test p-value of 0.000, suggesting a variable correlation. As both conditions are met, factor analysis is deemed appropriate for data analysis.

Communalities measure the degree of variance shared by a variable with all others. Put simply, it reflects how correlated an item or attribute is with all others. The table below displays commonalities for each factor. Initial communalities start at one, as unity values were inserted into the diagonal of the correlation matrix. Extraction commonalities show the variance in each attribute accounted for by the factors in the solution.

According to the thumb rule for commonalities, attributes with lower values are considered insignificant and may have difficulty loading onto any factor during factor analysis.

Table.5. Communalities:

Communalities		
	Initial	Extraction
SP1	1.000	.662
SP2	1.000	.753
SP3	1.000	.763
SP4	1.000	.554
SP5	1.000	.727
SEI1	1.000	.586
SEI2	1.000	.580
SEI3	1.000	.653
SEI4	1.000	.780
SEI5	1.000	.677
PI1	1.000	.653
PI2	1.000	.704

PI3	1.000	.603
PI4	1.000	.627
PI5	1.000	.562
PE1	1.000	.794
PE2	1.000	.807
PE3	1.000	.670
PE4	1.000	.775
PO1	1.000	.722
PO2	1.000	.823
PO3	1.000	.667
PO4	1.000	.795
PO5	1.000	.814
Extraction Method: Principal Component Analysis.		

Source: Computed data

Total Variance Explained: The table displays extracted factors, their Eigenvalues, percentage of variance, and cumulative percentage of variance. Eigenvalues indicate the variance explained by each factor. Factors with Eigenvalues below one are excluded. The first factor explains 34.522% of the variance, followed by the second (16.476%), third (7.623%), fourth (5.895%), and fifth (5.278%) factors. Together, they explain 69.794% of the variance, surpassing the 60% threshold. To improve factor scores, rotation using the Oblimin method is applied.

Table.6. Total Variance Explained:

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.285	34.522	34.522	8.285	34.522	34.522	3.896	16.235	16.235
2	3.954	16.476	50.998	3.954	16.476	50.998	3.357	13.985	30.220
3	1.830	7.623	58.621	1.830	7.623	58.621	3.286	13.692	43.913
4	1.415	5.895	64.516	1.415	5.895	64.516	3.132	13.051	56.963
5	1.267	5.278	69.794	1.267	5.278	69.794	3.079	12.831	69.794
6	.858	3.575	73.369						
7	.635	2.645	76.014						
8	.607	2.528	78.543						
9	.577	2.405	80.947						
10	.522	2.174	83.121						
11	.509	2.123	85.244						
12	.496	2.068	87.312						
13	.402	1.676	88.988						

14	.374	1.558	90.545						
15	.349	1.452	91.998						
16	.305	1.273	93.270						
17	.292	1.219	94.489						
18	.264	1.100	95.589						
19	.230	.959	96.548						
20	.203	.847	97.395						
21	.186	.774	98.169						
22	.169	.706	98.875						
23	.143	.594	99.469						
24	.127	.531	100.000						
Extraction Method: Principal Axis Factoring.									

Source: Computed data

Rotation of factors: The factor matrix, initially unrotated, indicates correlations between variables and factors but can be challenging to interpret. Rotation of factors is necessary to align factors with values close to 0 or 1, aiding interpretation.

Oblimin with Kaiser Normalization was employed for rotation, with nine iterations performed. This method helps reduce the number of variables with high loadings on a factor, enhancing factor interpretability. The rotated component matrix in Table 5 displays factor scores loaded onto respective factors.

Table7. Rotated Component Matrix:

	Component				
	1	2	3	4	5
PMKVY training programs in Uttarakhand effectively prepare participants for employment opportunities in their chosen fields.	.900				
Beneficiaries of PMKVY programs in Uttarakhand experience an improvement in their income levels after completing training.	.895				
PMKVY programs in Uttarakhand facilitate job placements for participants in reputable organizations and companies.	.883				
Participants who complete PMKVY training programs in Uttarakhand report a high level of job satisfaction and career advancement opportunities.	.847				
PMKVY programs in Uttarakhand contribute to reducing unemployment rates and enhancing economic prosperity in the state.	.808				
Participation in PMKVY programs in Uttarakhand has led to an improvement in the overall socio-economic status of beneficiaries.		.830			

PMKVY interventions in Uttarakhand have contributed to poverty reduction and enhanced livelihood opportunities for individuals and families.		.732			
The skill development initiatives under PMKVY have promoted social mobility and upward economic mobility for participants in Uttarakhand.		.725			
PMKVY programs in Uttarakhand have effectively addressed the specific needs and priorities of marginalized and vulnerable groups in the state.		.638			
The socio-economic impact of PMKVY in Uttarakhand is sustainable and contributes to long-term development outcomes in the state.		.553			
The infrastructure and facilities available at PMKVY training centres in Uttarakhand contribute to a conducive learning environment.			.787		
Participants in PMKVY training programs in Uttarakhand receive adequate support and guidance throughout their training journey.			.771		
PMKVY training programs in Uttarakhand effectively incorporate practical, hands-on learning experiences to enhance skill acquisition.			.744		
Trainers delivering PMKVY programs in Uttarakhand demonstrate high levels of competence and expertise in their respective fields.		.447	.698		
The curriculum of PMKVY training programs in Uttarakhand is aligned with the skill requirements of industries and employers.			.548		
The policy framework supporting PMKVY implementation in Uttarakhand provides adequate guidance and support for effective program delivery.				.836	
There is coordination and collaboration among various government agencies and departments involved in PMKVY implementation in Uttarakhand.				.821	
Funding mechanisms for PMKVY programs in Uttarakhand are sufficient to meet the needs and demand for skill development interventions.				.789	
There is scope for policy reforms and enhancements to strengthen the effectiveness and sustainability of PMKVY programs in Uttarakhand.				.698	
PMKVY programs in Uttarakhand demonstrate innovative approaches and best practices in skill development interventions.					.820
There is effective utilization of technology in PMKVY training programs in Uttarakhand to enhance learning experiences and outcomes.					.743
Public-private partnerships play a significant role in driving innovation and sustainability in PMKVY initiatives in Uttarakhand.					.740
PMKVY programs in Uttarakhand actively engage local communities and stakeholders in the design and					.692

implementation of skill development interventions.					
There is scope for further innovation and experimentation in PMKVY programs in Uttarakhand to address emerging skill needs and market trends effectively.					.586

Interpretation of factors:

Variables with high loadings on the same factor are considered to influence a single factor. Based on the table, the factors affecting the effectiveness of the PMKVY scheme in Uttarakhand.

Factor 1: It includes five variables namely; employment opportunities, income levels, job placements, career advancement opportunities, and reducing unemployment rates. These factors can be named under adequate **Employment Outcomes.**

Factor 2: It also includes three variables namely; overall socio-economic status, poverty reduction and enhanced livelihood, social mobility and upward economic mobility, specific needs and priorities, and long-term development. These factors can be named under **Socio-Economic Impact.**

Factor 3: The factor includes three factors, namely; industries and employers, competence and expertise, hands-on learning experiences, adequate support and guidance and infrastructure and facilities available. The variables can be placed under**Training Quality**.

Factor 4: It includes three variables, namely; guidance and support, coordination and collaboration, meeting the needs and demand for skill development interventions,and strengthening the effectiveness and sustainability. The variables can be placed under the **Policy Environment**.

Factor 5: The factor includes two variables, namely; innovative approaches and best practices, effective utilization of technology, innovation and sustainability, design and implementation of skill development interventions and emerging skill needs and market trends. The variables can be placed under **Program Innovation**.

Confirmatory Factor Analysis (CFA):

Confirmatory Factor Analysis (CFA) is a crucial analysis for validating correlations with a predetermined theory. R software is utilized in this study for conducting CFA. The initial step involves creating a confirmatory model. The figure below depicts the confirmatory model, along with indicator loadings, p-values, and estimate values. It's noted that indicator loadings should ideally be at least 0.6, preferably higher than 0.7. Consequently, any values below 0.6 have been excluded from the model.

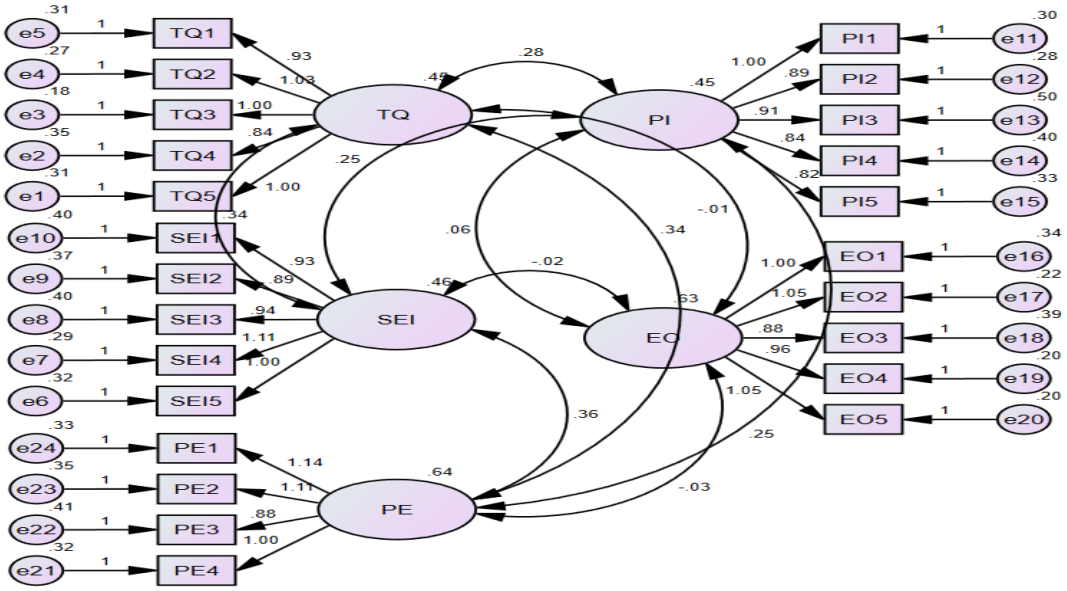

Table.8. Summary of Results:

	CR	AVE	MSV	MaxR(H)	PI	TQ	EO	SEI	PE
PI	0.831	0.597	0.386	0.837	**0.705**				
TQ	0.878	0.592	0.558	0.886	0.621	**0.770**			
EO	0.920	0.698	0.013	0.927	0.112	-0.013	**0.835**		
SEI	0.858	0.548	0.538	0.864	0.562	0.747	-0.043	**0.540**	
PE	0.884	0.656	0.429	0.889	0.461	0.629	-0.050	0.655	**0.810**

The above table represents the summary of results where CR, AVE, and MSV are computed and compared. CR is more than 0.7 for all constructs, and CR is more than AVE. AVE is more than 0.5, and AVE is more than MSV. Thus, all the criteria of validity and reliability are met.

Model fit Indices:

To determine the adequacy of the model, fit indices such as CFI, TLI, NFI, GFI, AGFI, and RMSEA are examined. According to the thumb rule, CFI and TLI values should be 0.9 or higher for a good model fit, with CFI exceeding TLI. Additionally, RMSEA and square mean should be less than 0.05. Table 7 presents the results of the model fit assessment.

Table.9. Model fit indices:

Model fit indices	Value	Acceptable criteria	Literature
Likelihood Ratio ($\chi 2/df$)	1.463	≤ 4	Wheaton et al. (1977)
Comparative Fit Index (CFI)	0.93	>0.95, 0.9 and >0.8(acceptable)	Bentler (1990)
Tucker-Lewis Index (TLI)	0.92	>0.9	Bonnet & Bonnet (1980
RMSEA	0.03	<0.05	Hu and Bentler (1990)
NFI	0.91	>0.9	Bollen (1989)
GFI	0.93	>0.9	Hu and Bentler (1990)

The above table reflects the index value of the required model fit indices. All the values of the model fit indices met the acceptable criteria.

Interpretation: After analyzing the data with the help of EFA and CFA we found that five factors affect the effectiveness of the PMKVY Scheme in Uttarakhand Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation.

Hypotheses testing:

H_a: There is a significant impact of demographic factors on the effectiveness of the PMKVY scheme.

H_0: There is no significant impact of demographic factors on the effectiveness of the PMKVY scheme.

Table 10. Results of Independent T-test for Gender:

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TQ	Equal variances assumed	.280	.598	-.563	118	.575	-.07097	.12612	-.32072	.17879
	Equal variances not assumed			-.561	114.217	.576	-.07097	.12661	-.32178	.17984
SEI	Equal variances assumed	.251	.618	-1.239	118	.218	-.16051	.12959	-.41714	.09612
	Equal variances not assumed			-1.237	116.925	.218	-.16051	.12972	-.41741	.09639
PI	Equal variances assumed	.236	.628	-1.255	118	.212	-.14994	.11951	-.38661	.08672
	Equal variances not assumed			-1.252	116.131	.213	-.14994	.11975	-.38712	.08723
PE	Equal variances assumed	.784	.378	-.451	118	.652	-.07286	.16137	-.39242	.24670
	Equal variances not assumed			-.448	110.020	.655	-.07286	.16248	-.39486	.24914
EO	Equal variances	1.057	.306	1.916	118	.058	.28838	.15051	-.00967	.58642

	assumed									
	Equal variances not assumed			1.910	115.046	.059	.28838	.15098	-.01068	.58744

Source: Author's calculation based on IBM SPSS-20 software output.

Interpretation: Before conducting T-tests, Levene's test is used to check for homogeneity of variance. If the significance value exceeds 0.05, equal variance is assumed, and results are reported accordingly. In the above Table factors such as Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation have significance values above 0.05, indicating equal variance assumption. The Independent T-test results show that factors of Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation have significant p-values of more than 0.05, accepting the null hypothesis.

Table 11. Results of Test of homogeneity of variance and Welch ANOVA test for Age (at 5% level of significance):

Factor	**Test of homogeneity of variance**				**Welch ANOVA**			
	Levene's Statistics	**df1**	**df2**	**Sig. value**	**Welch-Statistic**	**df1**	**df2**	**Sig.**
TQ	1.795	4	115	.046	.760	4	34.930	.558
SEI	.857	4	115	.000	1.242	4	35.204	.311
PI	2.437	4	115	.385	.562	4	35.237	.692
PE	1.063	4	115	.909	.652	4	34.701	.629
EO	2.795	4	115	.388	3.351	4	37.664	.019

INTERPRETATION: The analysis revealed that the assumption of homogeneity of variance was violated, leading to the use of the Welch ANOVA test. Significant differences were found in factors such as Employment Outcomes across various age groups, suggesting age influences these aspects of the effectiveness of PMKVY in Uttarakhand. However, age showed no significant impact on factors like Economic Impact, Training Quality, Policy Environment, and Program Innovation.

Table 12. Results of Test of homogeneity of variance and Welch ANOVA test for Qualification(at 5% level of significance):

Factor	**Test of homogeneity of variance**				**Welch ANOVA**			
	Levene's Statistics	**df1**	**df2**	**Sig. value**	**Welch-Statistic**	**df1**	**df2**	**Sig.**
TQ	.841	4	115	.502	.186	4	46.584	.945
SEI	1.155	4	115	.334	.749	4	46.648	.563

PI	1.320	4	115	.267	.611	4	47.417	.657
PE	.807	4	115	.523	.326	4	43.431	.859
EO	5.647	4	115	.000	2.785	4	40.636	.039

INTERPRETATION: The analysis revealed that the assumption of homogeneity of variance was violated, leading to the use of the Welch ANOVA test. Significant differences were found in factors such as Employment Outcomes across various Qualification groups, suggesting Qualification influences these aspects of the effectiveness of PMKVY in Uttarakhand. However, a Qualification showed no significant impact on factors like Economic Impact, Training Quality, Policy Environment, and Program Innovation.

Table 13. Results of Test of homogeneity of variance and Welch ANOVA test for Occupation (at 5% level of significance):

Factor	Test of homogeneity of variance				Welch ANOVA			
	Levene's Statistics	df1	df2	Sig. value	Welch-Statistic	df1	df2	Sig.
TQ	1.167	4	115	.329	.781	4	28.764	.547
SEI	2.999	4	115	.021	1.393	4	28.511	.261
PI	1.548	4	115	.193	.655	4	28.609	.628
PE	.871	4	115	.484	1.128	4	29.049	.363
EO	1.069	4	115	.375	3.783	4	33.509	.012

INTERPRETATION: The analysis revealed that the assumption of homogeneity of variance was violated, leading to the use of the Welch ANOVA test. Significant differences were found in factors such as Employment Outcomes across various Occupation groups, suggesting Occupation influences these aspects of the effectiveness of PMKVY in Uttarakhand. However, Occupation showed no significant impact on factors like Economic Impact, Training Quality, Policy Environment, and Program Innovation.

Table 14. Results of Test of homogeneity of variance and Welch ANOVA test for Monthly Income (at 5% level of significance):

Factor	Test of homogeneity of variance				Welch ANOVA			
	Levene's Statistics	df1	df2	Sig. value	Welch-Statistic	df1	df2	Sig.
TQ	2.350	4	115	.058	8.708	4	32.172	.000
SEI	2.544	4	115	.043	8.098	4	31.787	.000
PI	.539	4	115	.707	5.269	4	32.178	.002
PE	.789	4	115	.535	5.230	4	32.147	.002
EO	2.415	4	115	.053	1.282	4	34.541	.296

INTERPRETATION: The analysis revealed that the assumption of homogeneity of variance was violated, leading to the use of the Welch ANOVA test. Significant differences were found in factors such as Economic Impact, Training Quality, Policy Environment, and Program Innovation across various Monthly Income groups, suggesting Monthly Income influences these aspects of the effectiveness of PMKVY in Uttarakhand. However, Monthly Income showed no significant impact on factors like Employment Outcomes.

Table 15. Results of Independent T-test for Marital Status:

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TQ	Equal variances assumed	2.050	.155	1.012	118	.314	.14375	.14210	-.13765	.42515
	Equal variances not assumed			1.156	73.377	.251	.14375	.12431	-.10398	.39148
SEI	Equal variances assumed	1.251	.266	-.393	118	.695	-.05795	.14730	-.34964	.23373
	Equal variances not assumed			-.434	67.607	.665	-.05795	.13346	-.32429	.20838
PI	Equal variances assumed	.038	.846	.159	118	.874	.02159	.13594	-.24760	.29078
	Equal variances not assumed			.163	58.184	.871	.02159	.13211	-.24285	.28603
PE	Equal variances assumed	.854	.357	.835	118	.405	.15199	.18198	-.20838	.51235
	Equal variances not assumed			.895	63.394	.374	.15199	.16973	-.18714	.49112
EO	Equal variances assumed	.118	.732	.767	118	.445	.13210	.17228	-.20905	.47325
	Equal variances not assumed			.756	53.643	.453	.13210	.17470	-.21820	.48240

Source: Author's calculation based on IBM SPSS-20 software output.

Interpretation: Before T-tests are conducted, Levene's test is utilized to assess homogeneity of variance. If the significance value surpasses 0.05, it implies an assumption of equal variance, and subsequent results are reported accordingly. In the provided scenario, factors such as Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation demonstrate significance values above 0.05, indicating this equal variance assumption. The Independent T-test outcomes for these factors reveal significant p-values exceeding 0.05, leading to the acceptance of the null hypothesis.

Table 16. Results of Independent T-test for Place of Residence:

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TQ	Equal variances assumed	.000	.995	1.315	118	.191	.18636	.14168	-.09420	.46693
	Equal variances not assumed			1.301	53.916	.199	.18636	.14327	-.10089	.47362
SEI	Equal variances assumed	3.019	.085	.999	118	.320	.14659	.14677	-.14406	.43724
	Equal variances not assumed			.904	46.517	.371	.14659	.16212	-.17965	.47283
PI	Equal variances assumed	.011	.917	1.945	118	.054	.26023	.13382	-.00478	.52523
	Equal variances not assumed			2.023	59.498	.048	.26023	.12863	.00288	.51757
PE	Equal variances assumed	.916	.340	.953	118	.342	.17330	.18182	-.18675	.53334
	Equal variances not assumed			.925	52.157	.359	.17330	.18727	-.20247	.54906
EO	Equal variances assumed	.076	.784	-.759	118	.450	-.13068	.17228	-.47185	.21049
	Equal variances not assumed			-.688	46.692	.495	-.13068	.18983	-.51264	.25127

Source: Author's calculation based on IBM SPSS-20 software output.

Interpretation: Before conducting T-tests, Levene's test is employed to evaluate the homogeneity of variance. If the significance value exceeds 0.05, it suggests an assumption of equal variance, and the results are

interpreted accordingly. In this case, factors such as Employment Outcomes, Economic Impact, Training Quality, Policy Environment, and Program Innovation exhibit significance values above 0.05, indicating this assumption of equal variance. Subsequently, the Independent T-test results for these factors yield significant p-values exceeding 0.05, thereby leading to the acceptance of the null hypothesis.

Conclusion:

A study on the effectiveness of the PMKVY program in Uttarakhand revealed five critical areas: business outcomes, economic impact, quality of training, policy environment and policy innovation. Initially, the assumption of equal variances was met using independent t-tests, which showed no significant differences between the demographic variables for these measures but further testing showed that the assumption of difference equality has been violated. This led to the use of the Welch ANOVA test, which revealed significant differences across demographic groups, especially factors such as age, qualification, occupation, monthly income occupational outcomes etc. These data show that age, qualification, occupation and monthly income influence the effectiveness of the PMKVY program within Uttarakhand. Interestingly, age, qualifications, occupation and monthly income were not significantly affected by other factors such as economic impact, quality of training, environmental policy, systemic innovation etc. This shows that although a large number of people play a role in performance outcomes, the quality of the program in other States may not have the same impact on them In conclusion, though the PMKVY program shows consistent efforts in different demographic groups in terms of economic impact, quality of training, structural environment and policy innovation through demographic factors such as age, qualifications, occupation, monthly income has a significant impact on business results. These insights can inform the advancement of interventions and targeted changes to improve overall system effectiveness and inclusiveness in Uttarakhand.

Suggestions:

1. **Tailored Training Programs:**Develop training programs that are specifically tailored to different demographic groups, taking into account factors such as age, qualification, occupation, and monthly income. This customization can address the unique needs and challenges faced by each group, ultimately leading to better employment outcomes.
2. **Targeted Support Services:** Provide targeted support services, such as career counselling, mentorship programs, and financial assistance, to demographic groups that are found to have lower employment outcomes. This extra support can help individuals overcome barriers to employment and succeed in their chosen career path.
3. **Enhanced Outreach and Awareness**: Increase outreach and awareness efforts to ensure that individuals from all demographic groups are aware of the opportunities offered by the PMKVY Scheme. This can include targeted marketing campaigns, community engagement initiatives, and partnerships with local organizations.
4. **Continuous Monitoring and Evaluation**: Implement a system for continuous monitoring and evaluation of the PMKVY Scheme's effectiveness, with a specific focus on employment outcomes across different demographic groups. This ongoing assessment can identify any emerging issues or disparities and inform adjustments to program delivery and support services.
5. **Strengthened Data Collection and Analysis:** Enhance data collection and analysis efforts to capture more detailed information about participants, including their demographic characteristics, training experiences, and employment outcomes. This comprehensive data can provide deeper insights into the factors influencing program effectiveness and help tailor interventions accordingly.

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