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Drivers and Challenges Associated with the Implementation of Skill Development in India: An Exploratory Factor Analysis Approach

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Abstract:- Skill development is a crucial aspect of economic growth worldwide, with India's youth experiencing higher unemployment rates than the overall population. The government has placed significant emphasis on skill development initiatives in recent years. The study identifies various drivers and challenges related to skill development in India, which are explained through factors like Employment Security (ES), Financial Support (FS), Skill Development (SD), and Livelihood Opportunity (LO). These factors help individuals and communities invest in avenues that align with their skill appetite. The identified factors help the government formulate policies, industry representatives absorb skilled manpower, and identify areas for further skill enhancement. Individuals can enroll in state and central government policies to enhance their skill set and become trained for the industry. The state and central government can evaluate beneficiary performance by taking feedback from industry representatives and using the developed model to strategize for continuations, discontinuations, and improvisations, ultimately enhancing the marketability of skill development programs.

Keywords*: Government Policy, Employment Security, Financial Support, Skill Development, and Livelihood Opportunity.*

1. Introduction

In recent years, skill development has emerged as a critical aspect of economic growth and social progress in countries across the globe [1]. This trend is particularly evident in India, where the government has placed considerable emphasis on enhancing the skill sets of its workforce to meet the demands of a rapidly evolving economy [2]. The implementation of skill development initiatives, however, is a complex process that involves various drivers and challenges.

When compared to the overall population, young (15-29 years old) have greater unemployment rates, particularly educated youth with secondary and higher education. However, the economy's requirement for competent labour remains unsatisfied. The persistence of skill shortages is poised to become a significant impediment to the growth of the Indian economy [3].

In the age of globalization and a knowledge-based society, the significance of skills cannot be overstated. Enhanced skills provide economies, businesses, and individuals with a greater chance to respond effectively to the challenges of globalization [4]. Furthermore, globalization has accelerated the global exchange of education and training, creating new opportunities for learning and development.

In the past few decades, skill development has received limited attention in developing countries. Surprisingly, it was not explicitly addressed in the Millennium Development Goals (MDGs) and has been largely overlooked in poverty reduction strategies [5]. Neglecting skill development in informal sector is concerning, as it could be a

significant training destination in developing countries. However, in recent years, vocational education and training (VET) has regained significant interest within the international policy community [6]. The '2012 Education for All Global Monitoring Report' published by UNESCO specifically emphasizes the skills needs of young individuals [7]. The research emphasises the shortage of core skills among young people, with 200 million people aged 15 to 24 not finishing elementary school in 123 low- and lower-middle-income countries. This represents one in every five young individuals. Skills are emphasised in policy documents from organisations such as the World Bank and the International Labour Organisation.

In recent years, India has prioritised skill development, with the government pursuing programmes to create a competent workforce. The Eleventh Five-Year Plan (2007-2012) suggested a Rs. 228 billion 'Skill Development Mission'. The goal of the 'Coordinated Action on Skill Development' is to develop a skilled talent pool for diverse sectors of the national economy. The Prime Minister's National Council on Skill Development, the National Skill Development Coordination Board, and the National Skill Development Corporation are part of the institutional architecture that supports this effort (Govt of India, Ministry of mines, 2022). In conjunction with state governments and the World Bank, the government has undertaken a number of initiatives, including upgrading Industrial Training Institutes into Centres of Excellence, the Skill Development Initiative Scheme, and training youngsters in Jammu and Kashmir for Modular Employable Skills. Experts, industry organisations, and private partners are assisting the government in executing these programmes and building a new strategic framework for skill development under the jurisdiction of the Ministry of Labour and Employment.

The article sheds light on the multifaceted drivers that contribute to the effective execution of skill development initiatives in India. These drivers encompass a wide range of factors, such as government policies and regulations, funding mechanisms, industry collaboration, technological advancements, and the engagement of various stakeholders. By systematically analyzing these drivers, the researchers aim to provide a holistic understanding of the crucial elements that foster the success of skill development programs. Moreover, the article also explores the challenges faced during the implementation of skill development initiatives in India. These challenges include issues related to infrastructure, curriculum development, quality assurance, skill gaps, coordination among stakeholders, and the alignment of training programs with industry requirements. By identifying and analyzing these challenges, the authors highlight the areas that require attention and improvement to enhance the effectiveness and impact of skill development efforts [8][9].

The findings of this study have significant implications for policymakers, government agencies, educational institutions, industry players, and other stakeholders involved in skill development in India. The insights gleaned from the research can guide the formulation of evidence-based policies, the design of targeted interventions, and the allocation of resources to address the identified challenges and leverage the drivers for successful implementation. Overall, the article "Drivers and Challenges Associated with the Implementation of Skill Development in India: An Exploratory Factor Analysis Approach" offers a comprehensive and rigorous examination of the key factors that influence the execution of skill development programs in India (Sunil, Chakraborty, & Singh, 2021). Through their analytical approach, the authors contribute to the growing body of knowledge on skill development and provide valuable insights for advancing India's efforts towards a skilled and empowered workforce.

2. Literature Review

The literature on skill development in India highlights the significance of addressing the drivers and challenges associated with the implementation of skill development initiatives. The article titled "Drivers and Challenges Associated with the Implementation of Skill Development in India: An Exploratory Factor Analysis Approach" (reference) presents a comprehensive exploration of these factors using an exploratory factor analysis approach. This section reviews relevant studies and research that have contributed to our understanding of the subject.

Formal and informal vocational education

Smith and Clayton (2009) evaluated the outcomes of formal and non-formal vocational training over an extended period. Authors have analysed the critical factors such as employment rates, income levels, job satisfaction, and career progression for individuals who participated in both types of training. The findings provided insights into

the long-term impact of these training approaches. Ngaka, Openjuru and Mazur (2012) examined the benefits of non-formal vocational training programs in skill development. The article discussed the flexibility, responsiveness to industry demands, and practical hands-on learning experiences offered by non-formal training approaches. The study highlighted the importance of recognizing the value of non-formal training alongside formal programs. Eichhorst *et al.* (2015) focused on formal vocational training, this study investigated the advantages and challenges identified by industry professionals. Research article identified the factors such as curriculum standardization, certification recognition, industry collaboration, and employability outcomes. The findings contribute to understanding the value of formal vocational training in meeting industry needs. Lischewski *et al.* (2020) compared the formal and informal vocational education systems, exploring their differences in curriculum, certification, and teaching methods. in this article authors have highlighted the importance of recognizing and valuing both forms of education in meeting the diverse needs of learners and the labor market. Cameron and Harrison (2012) presented a comparative analysis of formal and informal or non-formal vocational training programs. in that article researcher have examined the similarities, differences, and effectiveness in preparing individuals for the workforce. The study explored the factors such as curriculum design, certification, teaching methods, and industry relevance to provide a comprehensive understanding of these training approaches.

Eraut (2000) discussed the challenges associated with both formal and non-formal vocational training and provides policy implications to address them. The article explored the issues such as access, quality assurance, standardization, and recognition of qualifications. The study offers recommendations for policymakers to enhance the effectiveness and efficiency of vocational training systems. Desimone *et al.* (2014) examined the effectiveness and outcomes of formal and informal vocational training programs. The article capable of analyzes the acquisition of skills, employment rates, and wage differentials among participants in both types of programs, shedding light on their respective contributions to workforce development. Alter Chen (2005) focused on the relationship between vocational education and economic development, this article explored how formal and informal vocational education programs impact employment rates, productivity, and economic growth. It emphasized the need for a balanced approach that recognizes the value of both formal and informal education in supporting economic development.

This research investigates the benefits of formal and informal vocational education in improving youth employment outcomes. It examines factors such as employability skills, job placement rates, and career progression for young individuals participating in both types of vocational education programs.

Formal and informal education setup

Education is a critical aspect of human development and societal progress. It takes place in various settings, ranging from structured institutions to everyday life experiences. This section of literature review aims to explore and analyze the distinctions, interplay, and implications of formal and informal education setups.

Formal education refers to the structured and institutionalized learning process that takes place in schools, colleges, and universities [18]. It is characterized by a planned curriculum, certified teachers, and standardized assessments. In contrast, informal education occurs through spontaneous and unstructured experiences within family, community, workplace, or other social settings. Informal education often arises from curiosity, personal interests, and practical needs, rather than adherence to a predefined curriculum [19].

Historically, formal education has been associated with the rise of educational institutions during the industrial revolution. It emerged as societies recognized the need for a skilled and literate workforce [20]. The establishment of schools and universities created a structured environment for imparting knowledge and skills. On the other hand, informal education has roots in humanity's early days, where knowledge was passed down through oral traditions, apprenticeships, and community practices [21]. Informal education played a crucial role in passing on practical skills, cultural knowledge, and social values from one generation to the next [22].

Formal education's structure and organization offer a systematic and comprehensive approach to learning [23]. It provides individuals with theoretical knowledge, critical thinking skills, and recognized qualifications. Teachers play a central role in formal education, guiding students through a predetermined curriculum and evaluating their progress through standardized assessments [24].

Informal education, on the other hand, fosters experiential and contextual learning. It nurtures practical skills, social values, and adaptive competencies that may not be fully addressed in formal settings [25]. Informal education can occur organically through day-to-day experiences, social interactions, and observation. It is driven by the learner's intrinsic motivation and personal interests, promoting a sense of autonomy and self-directed learning.

While formal and informal education setups are often seen as separate entities, they are not mutually exclusive. Instead, they complement each other in various ways. Formal education provides a strong foundation for intellectual growth and skill development. It equips individuals with essential knowledge, critical thinking abilities, and a structured understanding of various disciplines. On the other hand, informal education enhances practical application, creativity, and adaptability. It allows learners to explore their interests, passions, and potential career paths beyond the confines of a predefined curriculum. Informal education encourages curiosity and self-directed learning, which are crucial for lifelong learning and continuous personal development.

3. Methodology

Using an exploratory factor analysis technique, the study sought to uncover drivers for Skill Development implementation in India. It also examined the difficulties associated with harmonizing new education policy with the implementation process.

Research Design

Using an exploratory factor analysis technique, the study explores factors influencing Skill Development implementation in India [26]. A questionnaire (Likert scale-5 point) is used to collect data from beneficiaries, the general public, and the sample group for views and behavioural aspects. The multivariate analysis is based on self-designed structured questionnaires, five-point Likert scaled data for psychographics, and nominal scaled data for demographics [27].

4. Results and Discussions

Exploratory Factor Analysis

A questionnaire and a 5-point Likert-scale were used to collect data from 251 pilot research participants [28] (Scott, 2007). To discover factors, the study applies the statistical approach Exploratory Factor Analysis (EFA) (Guadagnoli & Velicer, 1988).

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.874
Bartlett's Test of Sphericity	Approx. Chi-Square	1274.68
	df	105
	Sig.	.000

KMO value of 0.874 indicates sample sufficiency for exploratory factor analysis, surpassing 0.6 [29]. This indicates that correlations are comparatively compact which will yield distinct factors [30]. The p-value for the Bartlett's Test of Sphericity is less than 0.05, showing that the correlation matrix is not an identity matrix (Sposito, 1983). Anti-image correlation analysis validates data sufficiency, with KMO values larger than 0.6 suggesting sufficient data for each utilised statement [31].

Components with eigen values greater than 1 account for 34.77% of total variance explained. Four components account for 58.9% of variance explained. Rotating the factor axis results in restructured factors, with Factor-1 explaining 18.24%, Factor-2 18.2%, Factor-3 11.84%, and Factor-4 10.65% of variance.

Table 2: Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	per cent of Variance	Cumulative per cent	Total	per cent of Variance	Cumulative per cent	Total	per cent of Variance	Cumulative per cent
1	5.215	34.766	34.766	5.215	34.766	34.766	2.737	18.245	18.245
2	1.356	9.041	43.807	1.356	9.041	43.807	2.728	18.189	36.433
3	1.165	7.768	51.575	1.165	7.768	51.575	1.775	11.836	48.270
4	1.102	7.344	58.919	1.102	7.344	58.919	1.597	10.650	58.919
5	.938	6.252	65.172						
Extraction Method: Principal Component Analysis.									

The Scree-Plot in Figure 1 verifies the number of components investigated using exploratory factor analysis. When the graph of eigenvalues and natural bend is examined, it is clear that four elements must be preserved because the curve flattens beyond point 4 (Velicer & Jackson, 1990).

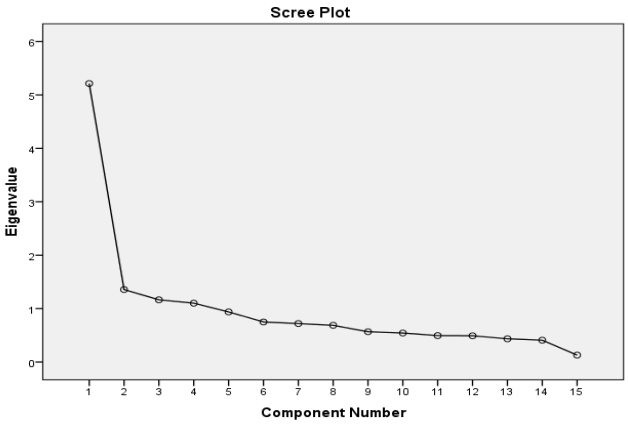

Figure 1: Scree Plot

Using Rotated Component Matrix analysis, the PCA analysis groups 15 assertions into four variables. Cronbach's Alpha is a test for determining dependability and internal consistency. Factor loadings are decreased from 5 to 4, with higher absolute values suggesting a greater contribution of the factor to the detected variables. Loads less than 0.4 are suppressed.

Table 3: PCA (Principal Component Analysis)

Factors	Items	Factor Loadings	Chronbach Alpha (α)	Total Variance Explained	Eigen Values
Employment Security (ES)	F9	.758	0.698	18.24 per cent	2.74
	F10	.660			
	F6	.588			
	F11	.586			
	F1	.545			
	F8	.529			

Factors	Items	Factor Loadings	Chronbach Alpha (α)	Total Variance Explained	Eigen Values
Financial Support (FS)	F3	.760	0.805	18.19 per cent	2.73
	F4	.736			
	F2	.731			
	F5	.481			
Skill Development (SD)	F13	.780	0.753	11.83 per cent	1.78
	F15	.550			
	F12	.495			
Livelihood Opportunity (LO)	F14	.763	0.667	10.65 per cent	1.60
	F7	.608			

As a result of our exploratory factor analysis (EFA), four factor-structures of the instrument of implementation of Skill Development in India explained 58.9% of the variance in the pattern of relationships among the items. All the four factors have required reliability as was confirmed by the statistical test (Cronbach's Alpha value) (Peterson, 1994). Fifteen items remained in final questionnaire and the four-factor structure instrument has been confirmed through this study.

5. Findings

Based on literature and data research, the paper analyses variables driving the implementation of Skill Development in India. The factor extraction approach was used to extract four factors, which accounted for 58.1 percent of the expressed variance. The sum of the changes reflected by these components was computed. Observing the Scree-Plot with eigenvalues revealed that the four components needed to be taken into account owing to natural bends and flattened curves beyond point 4.

The Four identified Factors are

a. Factor-1: **Employment Security (ES)** First factor, six statements, accounts for 18.24% of total variation with calculated eigen value of 2.74.

b. Factor-2: **Financial Support (FS)** Second factor, comprising four statements, accounts for 18.19% of total variation with calculated eigen value of 2.73.

c. Factor-3: **Skill Development (SD)** Third factor comprises three statements accounting for 11.83% of total variation, with eigen value 1.78.

d. Factor-4: **Livelihood Opportunity (LO)** Fourth factor, two statements accounting for 10.65% of total variation, has eigen value of 1.60.

All explored factors have significant impact on implementation of skill development in India at 95 per cent confidence interval as the p-value are less than 0.05.

6. Conclusion

The above study concludes that there are various drivers and challenges related to implementation of skill development in India which is explained through various identified factors through rotated component matrix approach, and it requires efforts from all stake holders and psychological science to define the pattern but primary responsibility is to device a frame work for this which includes parameters like Employment Security (ES) Financial Support (FS) Skill Development (SD), Livelihood Opportunity (LO) which will govern according to the options of skill development.

Individuals and communities may benefit from the identified variables and their association with skill development efforts by investing in areas that coincide with their skill hunger. This data may be utilised by the

government to develop regulations, industry representatives to recruit skilled workers, and individuals to identify areas for further skill development. Individuals can pursue their hobbies and engage in state and federal government programmes to improve their skill set and gain industrial training. Using input from industry representatives, the state and federal governments may evaluate beneficiaries' performance and strategize for continuations, discontinuations, and improvisations, eventually increasing the marketability of skill development programmes.

Limitations

The proposed work associated with many limitations that led to certain changes to the planned research design. Few of the constraints are described below:

a. The research topic required extensive primary and secondary data for in-depth analysis, utilizing external data from bank visits and contacts.

b. The self-administered questionnaire among savers and investors in the study contains lengthy questions, potentially impacting investment interest and saving interest.

c. Study respondents avoid feedback process due to confidentiality concerns, limiting participation.

d. Limited sample size and convenience sampling may result in bias in respondents' responses.

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