HOW DO STUDENTS SELECT A TRAINING INSTITUTE?

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ABSTRACT

With increasing commercialisation of education, much research into the strategies to maximize admissions and revenue, and to minimize drop-outs, has been conducted. A segment of educational institutions which has escaped such research is of vocational education and training (VET) institutes. This study aims to develop an explanatory model of the process of selection of a training institute by students. Exploratory Factor Analysis has been conducted on survey responses collected in Coimbatore, India through convenience sampling. Five factors have been identified that correspond to inputs from the faculty, quality of courseware, facilities aimed at increasing the student's convenience, social influences and the popularity of the institute. These results can establish a thorough understanding of the dynamics in this sector. An understanding of the customers' decision-making process can pave the way for targeted marketing and guide these institutions in enhancing their appeal. It can work as a framework for ranking and accreditation of institutes. It is a small step towards standardization of the quality of VET institutes which can encourage an environment of healthy competition among key players.

Keywords: *institute, technical, training, factor analysis*

INTRODUCTION

With industries seeking more people who have the right mix of theoretical and practical skills, industrial training institutes have gained prominence. Thousands of such institutes have come up in every city and district in India to capitalize on this emerging market. However, lack of regulation and accreditation on these institutes has made this a disorganized market, with knowledge-seekers at risk of getting duped and institutes at the risk of under-achieving their financial goals.

Research undertaken to explore the dynamics of the interactions among institutes, students and industries helps the management to enhance not just the training curriculum and delivery, but the employability of students. The economic revolution promised by "Make in India" has encouraged such research, which is still very limited in nature. As this segment of education providers can significantly influence the contribution of the youth towards the overall economic development of the country, it calls for more exploration.

In order to conduct a data-driven exploration into the process of selection, questionnaire based data collection has been undertaken. A survey of 298 respondents in Coimbatore, India is conducted to analyze the key factors that people consider in choosing an institute, and analyzed using factor analysis. Factor analysis is a statistical technique to convert the features into correlated clusters called

factors. Such factors unveil the structure in the data and can provide conceptual framework to explain the phenomenon under study.

LITERATURE REVIEW

The gap between the theoretical knowledge imparted through university qualifications and the competencies required by industries is creating a host of vacancies that are not getting filled by the thousands of educated people seeking jobs. Vocational education and training (VET) serve a significant role in preparing the workforce for manufacturing industries like automobiles and pharmaceuticals and service industries like ITES and hospitality. They effectively bridge the gap between the theoretical knowledge imparted in universities and the hands on training demanded by industries.

Although incorporated in the education system in the 1980s, the "Make in India" initiative by the Government of India has brought the spotlight on such institutions, both public owned and private owned. The economic revolution this initiative plans to trigger can lead to significant technological and infrastructure development in the country and open up new opportunities for employment. However, [1] highlights that of the huge manpower available in India less than 5% of available workforce is skilled. This is in sharp contrast to economies like Korea and Germany where over 75% labor is skilled. To compensate for this inadequacy in India, firms employ newer technology to reduce the need for labor. This dissuades firms from outsourcing their labor requirements to India, aggravates unemployment and negatively impacting the economy as a whole.

References [2, 3] study the action plan formulated to make India ready for "Make in India", the organizations set up to provide quality training across all sectors and the economic policies formulated to make it happen. Riding this wave of change, new training institutes are springing up in every nook and corner, with public, private and mixed ownership. This trend on one hand makes vocational training accessible to graduates all over the country. On the other hand, the potential customers are prone to make a poor choice given the many options, which can adversely affect their competency and the overall goal of "Make in India". From the perspective of the institutes, lack of understanding of the customer dynamics ends up in a struggle to balance the training quality and financial goals. Reference [2] highlights some challenges like complicated institutional set-up and inclusion of women in skill development programmes as some challenging aspects. This calls for a research focussed on such institutes.

Reference [4] studies the decision making process in selecting an educational institution for higher studies. It presents a theoretical model and enumerates the stages as need identification, information search, evaluation of alternatives and choice. Industry oriented training can equip young graduates with knowledge about latest technologies or a specialization in a particular one. For those already employed, training can make a career switch easier, open doors to better opportunities at work , alternate sources of income or save the livelihoods of those who are getting replaced by the younger, tech savvy workforce. It can also be driven by passion with no particular intention to make it a source of income. The decision to join a training programme is triggered by the identification of such a need.

This is followed by the hunt for a reliable institute. Recommendation made by peers and acquaintances and publicity efforts by different institutions play a significant role in this phase. The next phase is of evaluation of available alternatives, wherein the individual checks his financial resources, availability of time, convenience et cetera in the direction of making a choice.

Factor analysis is a multivariate statistical approach widely used in psychometric and social sciences [5, 6]. This method of analysis is used to uncover unobservable structures/latent variables present in the dataset. As these latent variables are formed by grouping correlated features, this is a dimension reduction technique. Availability of factor analysis techniques in commercial statistical packages has made it popular in diverse fields like medicine [7] and market research [8].

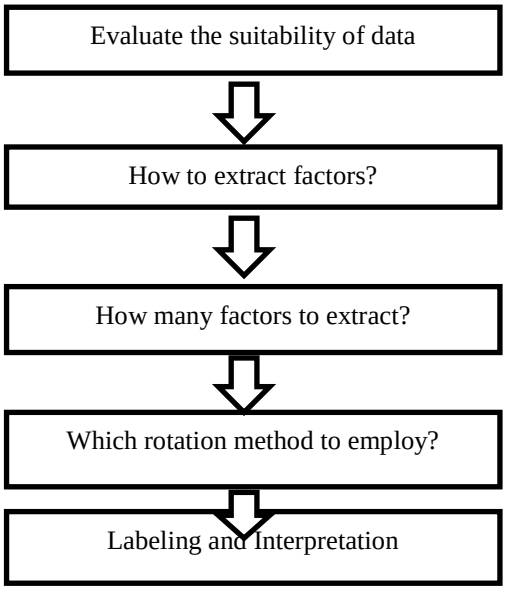

Figure I. Steps in factor analysis

Reference [9] provides a step by step guide to factor analysis, presented in Figure 1. In order to assess the dataset for suitability, three measures are taken into consideration. First, the sample size of the dataset is important in gaining reasonable accuracy. 100 is considered poor, 200 fair, 300 good, 500 very good and 1000 or more excellent. Second, the ratio of the number of responses to the number of variables is measured. There is a lack of consensus on the requisite ratio and it varies from study to study. Third, the correlation matrix for the original dataset is computed. Correlations of 0.50 and above are considered practically significant and indicate the relevance of factor analysis.

Besides these tests, the Kaiser-Meyer-Olkin test (KMO) is performed to ascertain the suitability of the dataset for factor analysis. This test returns a value between 0 and 1, indicating the sampling adequacy of the dataset. Additionally, the sampling adequacy of each variable is also returned. These values are mapped to goodness as shown in Table 1.

Table I. KMO Goodness scores

Score Range	*Goodness*
0.90-1.00	Marvelous
0.80-0.89	Meritorious
0.70-0.79	Middling
0.60-0.69	Mediocre
0.50-0.59	Miserable
0.00-0.49	Unacceptable

Once the adequacy of the dataset is ascertained, a suitable method for factor extraction is selected. As this field has undergone significant research, several methods like Principal Component Analysis, Maximum Likelihood, Image factoring et cetera are available. However, Principal Component Analysis (PCA) is known to be the most used and is often set as default in commercial statistical packages. In a scenario where the dataset does not demonstrate multivariate normality and no a priori structure is specified, PCA is recommended.

To determine the number of factors to generate/retain the Kaiser criteria is useful. The Eigen values of the correlation matrix are evaluated. The number of Eigen values greater than 1 is the number of factors retained. An alternate method is to use the Scree Plot and identify the cliff/knee for cut off. However, Scree test is subjective in nature. In the method of Parallel analysis is the actual Eigen values are compared with random order Eigen values. Factors are retained when the actual Eigen values surpass the random Eigen values. This method has been used in the current study.

Rotation of factors presents a more interpretable outcome. Determining the method used for rotation impacts the final solution. Orthogonal varimax is the most common rotation method in literature and has been used in this study. The resultant factors are uncorrelated and highlight the independent processes underlying the phenomenon under study.

Interpretation of the solution of factor analysis involves the domain knowledge and understanding of the researcher and reflects theoretical and conceptual constructs. This is subjective in nature.

MATERIALS AND METHODS

A. *Survey Questionnaire*

The survey was conducted using a questionnaire consisting of 23 items. The items explored in this questionnaire where the demographics of the respondent and their opinions on accessibility, recommendations, curriculum and method of delivery et cetera. The Likert Scale was used to measure the strength of opinion with 1 as “Strongly Disagree” and 5 as “Strongly Agree”. The respondents for this study were selected by convenience sampling. The questions are listed as below, along with the codes.

Table II. Survey Questionnaire

S.No.	***Statement of the question***	***Code***
1	To what age group you belong to?	Age.Group
2	Are you currently employed?	Employment.Status
3	Gender	Gender
4	Distance of the institute from my home/locality is important	Distance.Home
5	Availability of public transport to reach the institute is important to me	Public.Transport
6	The cost of the course is important to me.	Course.Cost
7	Good reputation of the institute is important to me.	Institute.Reputation
8	It is important to me that the institute is old and established.	Institute.Old
9	It is important to me that I know someone who has already attended that institute.	Old.Contact
10	It is important to me that my friends also join the course with me.	Friends.Joining
11	Discount on the fees if I join more than one course is important to me.	Discount.Multiple
12	Flexible class timings are important to me.	Flexible.Timings
13	It is important to me that batch size is small.	Batch.Size
14	It is important to me that the faculty members are friendly.	Faculty.Friendly
15	It is important to me that I can contact faculty members outside class hours.	Contact.Class
16	It is important to me that the faculty members have good knowledge.	Faculty.Knowledge
17	Up to date course content is important to me.	Update.Course
18	An interactive classroom atmosphere is important to me.	Classroom.Atmosphere
19	Good quality study material from the institute is important to me.	Study.Material
20	Regular assessments and assignments are important to me.	Regular.Assessment
21	Hands-on training project is important to me.	Handson.Training
22	Placement assistance from the institute is important to me.	Placement.Assistance
23	Industry exposure during training is important to me.	Industry.Exposure

B. ***Data Analysis***

R is open source statistical software. It provides the user with a range of packages with implementations of commonly used algorithms. The functions available in base R, stats and psych packages have been used for this analysis.

The following steps have been executed in performing the analysis.

- Check the sample size.
- Check the sample size: number of variables.
- Perform the KMO test.
- Calculate the Eigen values.
- Calculate the number of factors based on Kaiser Criterion.

- Run principal component analysis using “varimax” rotation.
- Interpret the results.

RESULTS AND DISCUSSION

A. Distribution based on Age

The pie chart presents the relative proportions of constituents in a mixed sample. It is very useful when the number of constituents is few.

Figure II shows the distribution of the respondents to the survey categorized by their age group. These age groups are roughly based on the stages in career. As an example, 18-24 years of age generally correspond to college goers and fresh joinees.

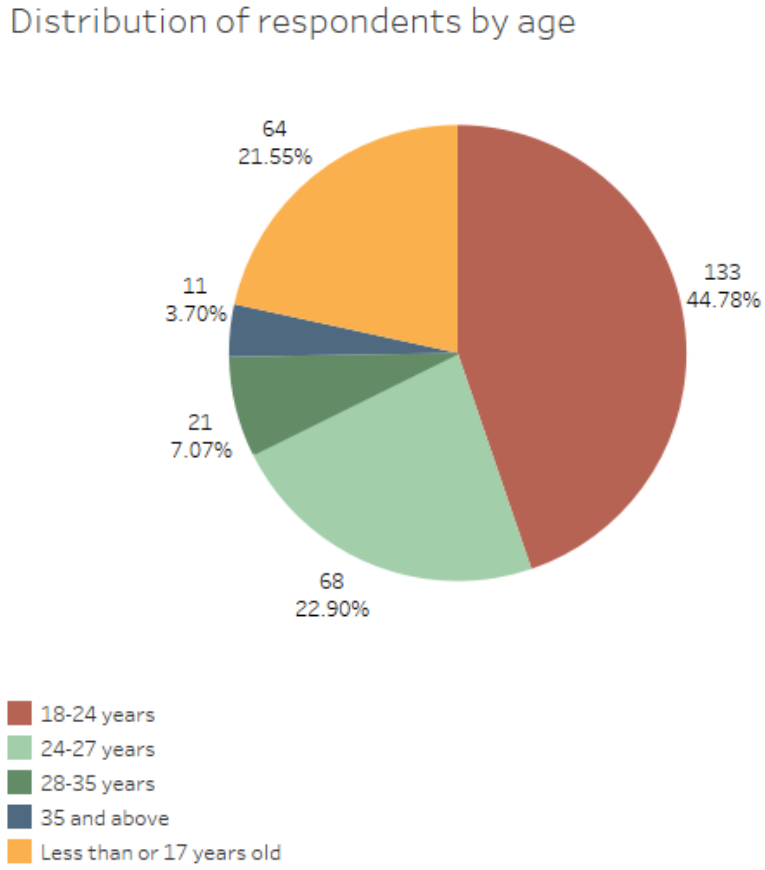

Figure II. Distribution of respondents by age

The majority of the respondents as can be seen from the pie chart are from the age group 18 to 24 years of age. The older respondents form an under represented group in this sample and their responses have been filtered out.

A. Distribution based on Gender

Treemap visualization of Figure III is used to represent the respondents based on gender.

Respondents have been given an option to not reveal their gender.

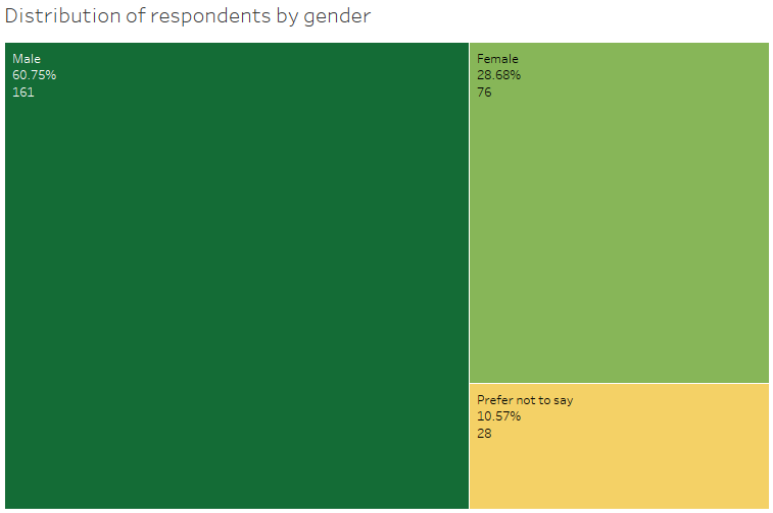

Figure III. Distribution of respondents by Gender

From the treemap of Figure III, it is seen that a majority of the respondents (60.75%) are males, with 28.68% being females. The responses from the set of respondents who have preferred not to reveal their gender for a variety of reasons have been excluded from the study. After exclusions based on age and gender, 237 responses have been analyzed further.

A. Distribution based on Employment Status

The employment status of an individual greatly impacts their motivation in seeking training. As those already in employment have some exposure to industry needs they may demonstrate more pickiness in selecting institutes and courses.

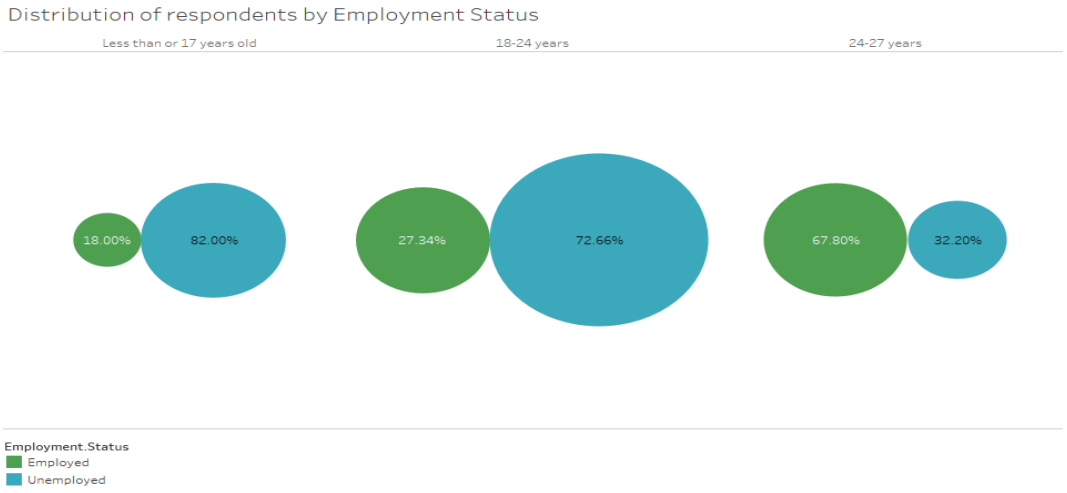

Figure IV. Distribution of respondents based on Employment Status

As seen in the bubble chart of Figure IV, for respondents below 25 years of age, majority are job seekers. The disproportionate representation of respondents grouped by age, gender and employment status makes the study heavily influenced by the opinions of the majority: 18-24 years of age, male and unemployed.

A. *Measure of correlation*

The Pearson coefficients of correlation between each pair of variables indicate possible relationship between them.

Presenting these coefficients as a graph can hint at possible feature groups at a glance.

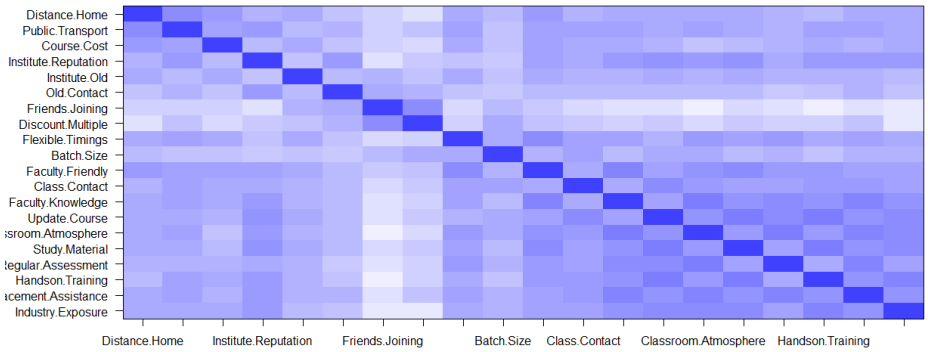

Figure V. Correlation plot

In Figure V, the darker shades of blue indicate higher values. The dark diagonal corresponds to the autocorrelation coefficients. The highest coefficients have values 0.5-0.6.

A. *Sample size to number of variables ratio.*

This ratio is 237:23 ~ 10:1.

B. *KMO Test.*

The KMO test yields a score of 0.9. This is a marvelous sampling adequacy and indicates that the data is suitable for factor analysis. For individual items, majority of scores are marvelous.

Table III. KMO Test Results

Variable Code	*Measure*	*Remark*
Distance.Home	0.92	Marvelous
Public.Transport	0.92	Marvelous
Course.Cost	0.93	Marvelous
Institute.Reputation	0.95	Marvelous
Institute.Old	0.94	Marvelous
Old.Contact	0.93	Marvelous
Friends.Joining	0.75	Middling
Discount.Multiple	0.77	Middling
Flexible.Timings	0.93	Marvelous
Batch.Size	0.90	Marvelous
Faculty.Friendly	0.95	Marvelous
Class.Contact	0.95	Marvelous
Faculty.Knowledge	0.96	Marvelous
Update.Course	0.90	Marvelous
Classroom.Atmosphere	0.93	Marvelous
Study.Material	0.95	Marvelous
Regular.Assessment	0.92	Marvelous

Handson.Training	0.94	Marvelous
Placement.Assistance	0.95	Marvelous
Industry.Exposure	0.94	Marvelous

C. *Number of factors.*

The psych package in R offers a variety of tools to perform factor analysis and related operations. Using fa.parallel function, 5 factors have been suggested.

D. *Factor extraction.*

Principal component analysis using varimax rotation outputs the following loadings.

Table IV. Factor Loadings

Dimension Name	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*
Distance.Home	0.25	0.23	**0.74**	0.08	0.12
Public.Transport	0.28	0.29	**0.59**	0.19	0.29
Course.Cost	0.18	0.25	**0.75**	0.11	-0.05
Institute.Reputation	0.36	0.50	0.18	0.19	**0.53**
Institute.Old	0.28	0.19	**0.49**	0.36	-0.05
Old.Contact	0.19	0.25	0.20	**0.53**	**0.49**
Friends.Joining	0.01	-0.03	0.21	**0.84**	0.04
Discount.Multiple	0.14	0.17	-0.02	**0.84**	0.02
Flexible.Timings	**0.53**	0.21	**0.48**	0.16	-0.23
Batch.Size	0.29	0.38	0.17	**0.48**	**-0.47**
Faculty.Friendly	**0.57**	0.25	0.41	0.22	0.06
Class.Contact	0.23	**0.65**	0.28	0.23	-0.18
Faculty.Knowledge	**0.73**	0.29	0.24	0.09	0.18
Update.Course	0.32	**0.80**	0.15	0.15	0.01
Classroom.Atmosphere	**0.78**	0.33	0.17	0.06	0.06
Study.Material	0.37	**0.66**	0.22	0.15	0.17
Regular.Assessment	**0.78**	0.27	0.16	0.10	-0.05
Handson.Training	0.30	**0.74**	0.23	0.03	0.11
Placement.Assistance	**0.67**	0.40	0.15	0.18	0.08
Industry.Exposure	0.39	**0.63**	0.28	-0.03	0.09

E. *Extracted Factors*

1) Faculty Inputs:

This feature includes the contribution the faculty can bring with their competency and readiness to assist the students. This includes the variables corresponding to their availability (Flexible.Timings), friendliness towards the students (Faculty.Friendly), expertise

(Faculty.Knowledge), the level of interaction maintained in the classroom (Classroom.Atmosphere), how they evaluate the learner (Regular.Assessment) and the guidance they can provide for job hunt/interviews (Placement.Assistance). It is observed that faculty has a significant role to play in pleasing customers and generating revenue. Thus, special focus is required on the hiring process and faculty skill development. The collaboration between Singapore and India for skill development programme for "Make in India" as mentioned in [3] is in accordance with these observations. The experts from Singapore provide invaluable technical knowledge to the Indian workforce. Private institutes can invite retired professors, army personnel and industry experts to enhance the curriculum and course delivery. Investments in the human resources can go a long way in raising the standards of these training institutes.

2) *Quality of Course Delivery:*

This factor involves those variables which indicate how the training is imparted to the students through printed material, face to face communication and practical aspects. This includes relevance of the course to latest trends (Update.Course), the quality of the study material (Study.Material), practical hands on training (Handson.Training), exposure to the industry standards (Industry.Exposure) and the availability of the faculty outside of class hours to assist in doubts and queries (Class.Contact). Keeping this into consideration, the course should be prepared meticulously and get regular revisions. Web portals can be created to facilitate discussions between the faculty and the students.

3) *Institute Appeal:*

These include the facilities that the institute can offer to appeal customers. This factor includes reasonable pricing (Course.Cost), distance from the place of residence (Distance.Home), easy access (Public.Transport), flexible class timings (Flexible.Timings) and recognition (Institute.Old). Location of the institute is a critical factor.

4) *Social dynamics:*

This factor corresponds to interactions in the classroom. This includes a preference for friends joining the same place (Friends.Joining) and recommendations by former students (Old.Contact). Marketing teams should acknowledge the power of student referrals and use it to their advantage. It also includes preference for a small batch size (Batch.Size), i.e. more opportunities to interact with the faculty. Discounts when joining multiple courses (Discount.Multiple) falls in this group.

5) *Popularity of the Institute:*

This factor consists of variables related to reputation (Institute.Reputation), recommendations by former students (Old.Contact) and preference for small batch size (Batch.Size). Reviews about the faculty and management from past students, general acquaintances and media create reputation, which is in itself a critical decision variable. With greater popularity, maintaining small batch sizes without overstaffing or overburdening the faculty becomes a challenge for the management. As the

feature (Batch.Size) has negative loading, people with preference for small batches may prefer an institute of relatively lower popularity.

A cross loading of (Flexible.Timings) is observed. As the facility of flexible timings contributes both to the image of the faculty and the institute, this variable has been integrated into both the factors. (Batch.Size) appears with positive loading in factor and negative in another. These five factors explain up to 68% of the variances observed in the dataset which is a good score.

CONCLUSION

This study explores the factors that students take into consideration while selecting training institutes. Exploratory factor analysis unveils five factors- faculty competency, course quality, institute appeal, social dynamics and finally, the popularity of the institute. This serves as a guideline not just to the institutes to understand the customers, but also to the customers to avoid getting fooled into making a poor choice. These results can also be utilized to score institutes, similar to the star ratings given to hotels, and thus maintain a requisite level of quality. With the "Make in India" putting the spotlight on skill development, these results, and research of similar nature, can establish VET on the same footing as university education.

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LIMITATIONS AND FUTURE WORK

The current study is based on data collected through convenience sampling. Extension of this study to a larger dataset using random sampling can yield generic results. Further, as this has been collected specific to the city of Coimbatore, similar studies can be replicated to cover a more diverse population in terms of demography and geography. The age group of 28 years and above forms an under-represented group. Thus more responses collected in this particular category can reflect results that deviate from the observations in this study. Thus the limitations of the current study leave plenty of room for further research. Additional research can be conducted to assess the level of satisfaction among the learners of these institutes. This can establish a comprehensive index to rate these institutes and assist customers in making a selection.

REFERENCES

[1] Mehrotra, S., Raman, R., Kumra, N., Kalaiyarasan and Rob, D., 2014, "Vocational Education and Training Reform in India- Business Needs in India and Lessons to be Learned from Germany", Bertelsmann Stiftung.

[2] Deka, R.J. and Batra, B., 2016, "The Scope of Skill Development, Employability of Indian Workforce in Context of Make in India: A Study", International Journal of Engineering Technology, Management and Applied Sciences, Vol. 4, Issue 4, ISSN 2349-4476.

[3] Prasad, J. and Purohit, D.G.M., 2017, "Skill Development, Employability and Entrepreneurship through Make in India: A Study", International Journal of Engineering Research and Application, Vol. 7, Issue 12, pp. 18-28, ISSN 2248-9622.

[4] Eidimtas, A. and Juceviciene, P., 2013, "Factors Influencing School-Leavers Decision to Enrol in Higher Education", Procedia- Social and Behavioural Sciences 116(2014), 3983-3988.

[5] Rahman, M. S., Uddin, M. K. and Akther, S., 2008, "Investigating the Reasons of Employee Turnover in Bangladesh: A Factor Analysis",The Chittagong University Journal of Business Administration, Vol. 23, ISSN 2219-4843.

[6] Sprang, G. and Craig, C., 2007, "An Exploratory Factor Analysis of the Trauma Practices Questionnaire", Best Practices in Mental Health, Vol. 3, No. 2, pp. 10-20.

[7] Luarte-Martinez, S. and Diaz, P.A., 2017, "Exploratory factor analysis of a score grading the severity of bronchial obstruction evaluated in children younger than 3 years old, Chile, 2015", Arch Argent Pediatr 2017, 115(6), e370-e376.

[8] Constantin, C., 2014, "Principal Component Analysis-A Powerful Tool in Computing Marketing Information", Bulletin of the Transilvania University of Brasov, Series V, Economic Sciences, Vol. 7(56), No. 2.

[9] Williams, B., Onsman, A. and Brown, T., 2010, "Exploratory factor analysis: A five-step guide for novice", Journal of Emergency Primary Health Care, Vol. 8, Issue 3, IssN 1447-4999.