A STUDY ON THE IMPACT OF ONLINE LEARNING ON THE EMPLOYABILITY SKILLS OF ENGINEERING STUDENTS

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ABSTRACT

Online getting-to-know technologies are at the forefront of new advanced academic technologies. Online Learning is a shape of education that is increasingly used in faculties in the evolved global. The utilization of Online Learning has been considered at an initial degree for the past few years, but now it's faced an enormous boom everywhere in the world because of COVID-19 pandemic state. In this paper, a strive has been made to look at the effect of online Learning on the employability skill of engineering college students within the Tamil Nadu region.

Keywords: Employability Skill, e-learning, Spearman's Rank Correlation, Likert Chart, Logistic Regression.

I. INTRODUCTION

Employability abilities can be described as the transferable abilities wanted through a character to make them 'employable'. Employers regularly outline a hard and fast of capabilities they need from a worker, along with desirable technical knowledge and difficult know-how. Therefore engineering college students have to have certain abilities to gain a task. These abilities are widespread competencies and are recently known as employability capabilities. Employability has been defined as "the functionality for gaining and keeping employment". Skill is the potential to perform an assignment with pre-decided outcomes, often inside a given quantity of time and energy.

Online Learning has been considered to be in its infancy in recent years, but due to the COVID-19 pandemic, it has had tremendous growth globally. It is distinctive from conventional mastering. In this paper, an attempt has been made to study the effect of online education on the employability skills of engineering students in the Tamilnadu region.

II. REVIEW OF RELATED RESEARCH

Singh and Bajpai Singh [13] examine the data for the interaction effects of e-learning study on male, female and socio-economic characteristics. It is concluded that higher education should aim to develop e-learning strategies that encourage greater engagement and consider the diverse learning styles within the student body to improve motivation and

academic achievement. Chitra [1] studied the perception of Employers and Employees required by the entry level engineering graduates for multinational companies. She concluded that there is a significant difference in the perception of the students, which makes them unemployable. Dawle et al. [3] discussed providing engineering graduates with the employability skills they need to be successful and develop into knowledgeable citizens who can assist the entire country. Christina Shirley and Ravichandran analyzed the employability skills and implications for fresh engineering graduates [2]. The Need to Bridge the Skills Gap among Engineering and Management Graduates in Andhra Pradesh was studied by Padmini I [6]. Gowsalya and Ashok Kumar [5] investigated the present literature on the discipline of employability ability triumphing in India. The literature survey's attention changed to checking those employability capabilities like analytical skills, self-understanding, popular control and painting lifestyle, leadership and hassle-solving capability and communication. The employability skill analyzed in this literature survey blanketed MBA graduates, engineering graduates, and University students additionally ranks in the employability ability of the respondents who need to enhance the prevailing district. Being excellent at one skill cannot facilitate competency within the other. The study concluded that the current situation is that the applicant who is multi-tasking can sustain.

III. MATERIALS AND METHODS

A. *Materials*

In the present study, the primary data collected from the respondents up to 22 years of age was considered undergraduate engineering students from Tamil Nadu, three districts: Kanyakumari, Tirunelveli, and Thoothukudi. For data collection, 600 respondents were approached using a stratified random sampling method.

A systematic questionnaire with nearly 25 statements and a 5-point Likert scale was adopted for gathering primary data. The questionnaire includes questions to assess how online education affects engineering students' employability abilities and to look into the response of a dependent variable.

B. *Methodology*

Frequency Distribution:

A representation of the number of observations inside a specific interval, either graphically or tabulated, is called a frequency distribution. The difference between frequency and distribution is how frequently a value appears within an interval.

Spearman's Rank Correlation:

The Spearman ranking correlation is a statistical test that measures how closely two features fluctuate. The features are ranked based on their similarity and dissimilarity, and then the correlation/association between the features is calculated using the following equation.

$$\rho = 1 - \frac{6\sum d_i^{\,2}}{n(n^2 - 1)}$$

Where ρ is the Spearman coefficient,

d_i is the difference between each feature rank, while

n is the total number of observations.

The value of the Spearman coefficient also varies between -1 to $+1$.

Spearman's rank correlation analysis was employed to examine the relationship between the effect of online education and employability skills. The sign of Spearman correlation indicates the relation of the analyzed variables [8].

Logistic Regression

Logistic regression is an alternate regression technique. It is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables. This algorithm is suitable for binary classification. The value produced by logistic regression is a probability value between 0 and 1. These values are computed by

$$Y_i = e^u / (1 + e^u)$$

Where Y_i is the estimated probability that the ith case is in a category, and u is the ordinary linear regression equation [12].

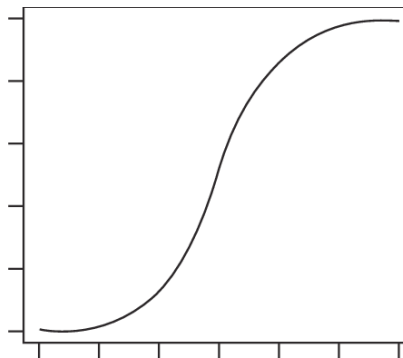$$u = A + B_1 X_1 + B_2 X_2 + ... + B_K X_K$$

Fig. 1: Graphical Representation of Logistic Curve

IV. RESULTS AND DISCUSSION

Initially, frequency analysis is calculated for the variables in the dataset. From the frequency table, notice that most (74.2%) respondents aged 18 to 20 were related to employability skills through online education. 82.7% were female students compared to males, and 94.5% were undergraduate students. 71.3% of students felt their college provide the opportunity to enhance their skills. 51.5% of students like their teachers. During COVID-19, 38.7% of students felt their online classes might be helpful. 85.7% of respondents feel

that offline teaching is the best way to enhance their skills. The Zoom app is the technical platform 65.3% of students use for online classes. 59.5% of students felt that Email is the best medium to disseminate course contents and notes to e-learners. During COVID-19, 72.5% of students developed their skills.

Out of these, 28.5% highly developed their online communication skill. 35.3% of students have no comments about gaining knowledge during online classes. 46.5% of students believed they only gained practical knowledge through offline classes, and 37.3% felt they couldn't learn anything useful online. When the online exams were turned into offline exams, 40.5% took some time to adapt, and 42.8% of students felt they could not socialize at events like cultural and sports meets, which are the problems faced in online classes during COVID-19. 55.2% agree that their college utilizes students' talents to their optimum level and 62.3% agree that their college provides adequate instruction among students to improve their skills, and 54.3% agree that their college provides adequate skill development facilities. 43% agreed modern classes increase their study pressure. 48.2% agree with frequent updating of students with new technology. 50.2% were agreeing the college provides good health programmes and also provides facilities for self-development, which was agreed upon by 59.7% of the students. 50.7% of respondents said they were satisfied with their skills, while 59.3% said college encouraged them to acquire more skills. Finally, 54.2% agreed that they have the opportunity to use and develop their skills and abilities.

The Likert chart for identifying skills and full utilization stratification level is depicted in Fig. 2.

Fig.2: Likert chart for Identification of Skills and Full Utilization

Spearman rank correlation analysis was used to examine the relationship between the variables and the impact of online education on employability skills. The sign of the Spearman rank correlation indicates the correlation of the analyzed variables. A positive sign indicates that an increase in one unit of the independent variable will affect an increase in the other variable. There is Data analysis that covered almost all respondents shows that the calculation of the Spearman rank coefficient (ρ) between the variables shows colleges utilize the talents of the students to their optimum level, colleges provide adequate instruction to the students to improve their skills, modern classes increase study pressure, frequent updating of students with new technology, the college provides adequate skill development facilities, good health programmes, self-development of students and encouraged them to improve their skills, the students satisfied with their skills, they have the opportunity to use and develop their skills and abilities. The above variables are positively correlated with highly significant with 99% of the confidence interval. The analysis is shown in Figure 1.
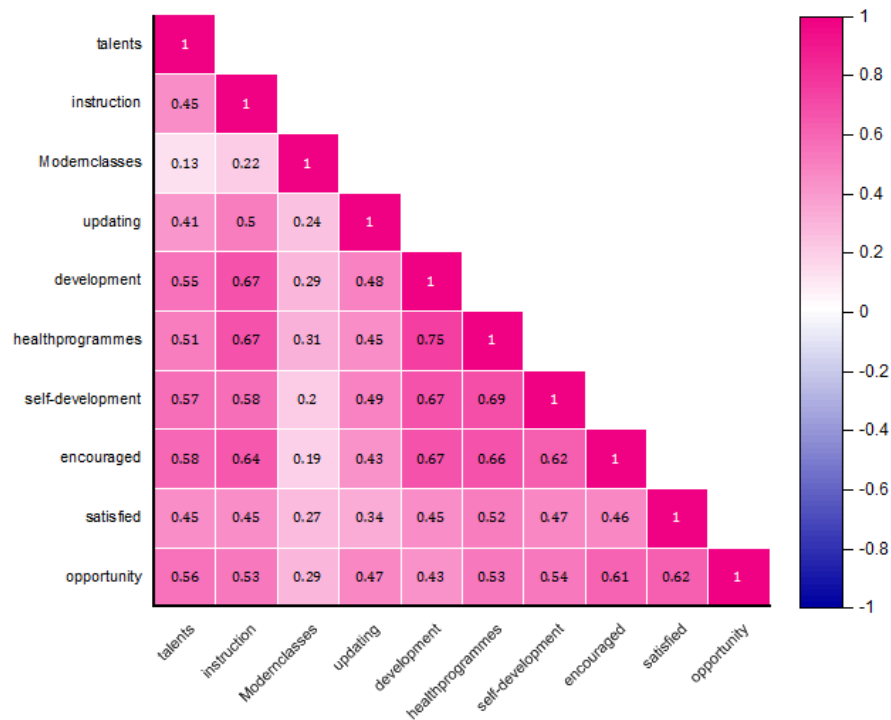

Fig.3: Graphical Representation of Spearman's Rank Correlation

Now to analyze the logistic regression of the variables, the prediction model is,

$$Y = AX + B$$

"Y" is the dependent variable, and the dependent variable is considered Categorical (Yes or No). Here the considered variable is "developed their skills during the COVID-19 period". Depending on the statistical analysis of the final value of the chi-square, which is 94.148 in the model with 5 degrees of freedom, the omnibus test demonstrates the significance of the association between the response variable and the explanatory factors. The total model is, therefore, statistically significant. Then, depending on whether you use the Cox & Snell R2

or Nagelkerke R2 approaches, the explained variation in the dependent variable based on our model ranges from 14% to 21%.

From the type of observations, logistic regression estimates the opportunity of an occasion going on. The model now correctly classifies 77.8% ordinary with the independent variables introduced. 94.3% of students had advanced their competencies at some stage in the pandemic, while 34.5% of the scholars had no longer developed their capabilities.

Table 1: Classification Table of Logistic Regression

Classification Table[s]

	Observed		Predicted		Percentage Correct
			Did you develop your skills during the COVID-19 period?		
			No	Yes	
Step 1	Did you develop your skills during the COVID-19 period?	No	57	108	34.5
		Yes	25	410	94.3
	Overall Percentage				77.8

a. The cut value is .500

The Wald test determines the statistical significance of each independent variable. From the result variables, age, gender, and teachers added significantly to the model. However, the variables provide opportunities to enhance their skills and gain knowledge. Online classes are less effective and did not upload notably to the model, and the "variables in the equation" show that 2.6 times more females than males evolved their skills during the pandemic duration.
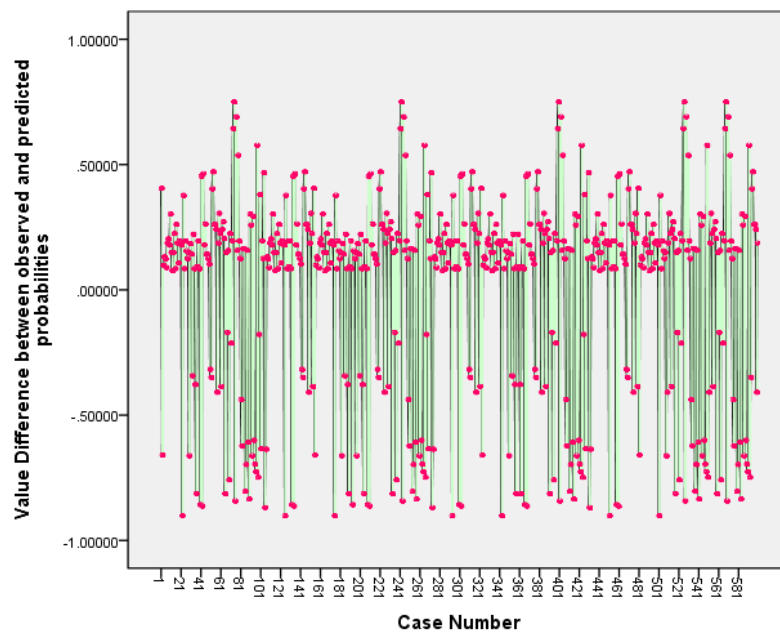
Fig.4: Residual Chart for the regression model

From the residual chart, we conclude that the error follows standard normal variate with mean zero and constant variance. Hence the accuracy level is more appropriate.

CONCLUSION

In the current global job market, employability is very important. This study sought to determine the level of competence of engineering graduates. This study contributes to our understanding of the employability skills of engineering students and the skills they possess. Based on the results, variables like age, gender and teachers are significant in the model; The remaining two variables were not significant using logistic regression. Most engineering students have honed their skills during the Covid-19 era.

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