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MESSAGE FROM THE DESK OF EDITOR IN CHIEF

The Chief Editor and Editors of the advanced research journal of Management, Engineering, Law, Paramedical Science, Nursing, Basic Science, Education, Physical Education and Yoga, Special Education, Clinical psychology and Liberal Arts i.e. IUT Journal of Advanced Research and Development (JARD) would take it as their duty to express the deep gratefulness to the contributors and readers of current volume.

We feel proud to bring the present issue of the online IUT Journal of Advanced Research and Development. We consider that the contribution in this multidisciplinary will help in the inclusive and sustainable growth process. Keeping in tune with this dignified idea, the current issue of IUT-JARD has addressed some current issues covering diversified field.

This issue needs an integrative and a holistic approach to the solution. Finally, the information contains in this journal volume has been published by the IUT obtains by its authors from various sources believed to be reliable and correct to the best of their knowledge, and publisher is not responsible for any kind of plagiarism and opinion related issues.

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MODELING BSE AND FUTURE DERIVATIVE MARKET VOLATILITY IN INDIA

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Abstract

In financial market, various shares, bonds, securities or currencies are traded on the daily basis, thus making most of the datasets as time series data where price is plotted against a time series. There are many techniques that can be used with time series data like ARIMA Model, Exponential smoothing, Neural Networks or Simple moving average. However ARIMA Model is commonly used to understand time series analysis in order to extract meaningful characteristics of the data and help in prediction of the stock and derivative prices. Since it helps to understand what happened in past and past behavior of data can help to predict future. Time series is a special property and different set of predictive algorithm. In this research key components of time series data have been discussed and implemented using ARIMA model. The data comprises of time series data on 18 companies and one index from BSE of India. The daily closing price of the stocks and index are considered for the spot market, the near month contract has been used to analyze the stock and index future market. Using ARIMA model the investor can predict the spot and future market prices. To a certain extent, it represents the overall trend of spot and futures market prices and the forecasting results have some reference value for investors. Therefore investors can refer to the model established in this study to build their own portfolios.

Key words: Future derivatives, ARIMA, BSE,

1. Introduction

The economic development of a country is reflected by the progress of the various economic units, classified into corporate sector, government and household sector. While performing their activities these units will be placed in a balanced/surplus /deficit budgetary situation. While the corporate will have a surplus arising from the retained earnings, their need for funds will be for investment in new projects, for expansion / diversification / modernization, etc. On the other hand, the government which is always in a deficit budgetary situation will be in need of funds; for public expenditure, to finance its developmental projects and other PSUs, etc. Apart from these two economic units, even the household sector will require funds for varied purposes e.g., for acquiring assets. However, the surplus funds of the households will normally be more when compared to the other units. Hence it can

be observed that, at any given point of time there would be some units having idle funds and a few others which would be in need of funds. The volume of funds required for the investment activity of the corporate and for the public expenditure of the government is very large when compared to the household requirements and if funds are not provided for these activities, it will hinder economic progress. On the other hand, there are surplus budget units which have excess funds in the form of savings.

Hence, there should be a mechanism to ensure that savings flow from those who save to those who wish to invest. This process would enable the utilization of excess idle funds, thereby enhancing their value. Enabling such a transfer of funds from the savers to the borrowers is the Financial System. The financial system represents a channel through which savings are mobilized from the surplus units and routed to the deficit units. The role of the financial system can be broadly classified into the following:

Savings Function – Mobilize savings in a way to provide a potentially profitable and low risk outlet. Policy Function – Through the policy function, the government ensures a smooth flow or funds from savings into investments in order to stabilize the economy.

Credit Function – After mobilizing the savings and laying down the necessary policies for the transfer of these funds, the credit function of the financial system, will then ensure that these savings will transform into the necessary credit for investment and spending purposes. The investors can be motivated to save and invest in the capital market only if prices of their securities in the market are affordable, fair and safe. Increasing the predictability of markets and curbing excessive risk taking by providing the needed incentives for firms and financial market participants would certainly help in bringing around investor confidence in financial markets and resultant economic growth. Financial derivatives are powerful instruments that have benefited market participant in managing their risk effectively. In the developed countries, lots of studies have been conducted to identify a suitable model to forecast volatility of future derivative traded in the stock exchanges. Whereas in India, only few studies have been conducted to identify a suitable model to forecast volatility of future derivative traded in the stock exchanges. All these studies have been conducted with different industries during different periods in derivative market using GARCH model. But no comprehensive study has been made so far in India using ARIMA model. Hence the study Modeling Stock Market and Future Derivative Market Volatility in India has been undertaken.

2. Objectives of the Study

The study has been carried out with the following objectives:

1. To study the conceptual framework of the future derivatives market in India.

2. To find out the existence of normality in the prices of the future stock of the companies and index taken for study.

3. To test for the existence of stationary in the prices of the spot stocks of the companies and Index taken for study.

4. To identify the suitable model within which the movement of the prices of the spot stocks of the companies and Index taken for study, in the Research period,

5. To suggest the investors, policy makers, fund managers and analysts to make on investment decisions, in the spot and the future stocks.

3. Hypotheses for the Study

The study has been carried out with the following null hypotheses.
Null hypotheses

H01: The distribution in the returns of the Companies shares and BSE in the Spot Market is not normal.

H02: There is no stationary in returns of the Companies shares and BSE in the spot market.

H03: There is no stationary in returns of the Companies shares and BSE in the spot market.

H04: The distribution in the returns of the Companies shares and BSE in the Future Market is not normal.

H05: There is no stationary in returns of the Companies shares and BSE in the Future market.

H06: There is no stationary in returns of the Companies shares and BSE in the Future market.

4. Research Methodology

This study is basically explorative and analytical.

Universe

The universe for this study includes all the companies listed in equity derivative market (Future Market), which are listed in Indian Stock Exchange. The following is the process of narrowing down the universe:

STEP1: Listing of Index underlying assets traded in the Indian derivative market.

STEP 2: Selecting the most traded and popular Index (BSE 50)

STEP 3: Listing of individual securities traded in the Indian derivative market. (137companies).

STEP 4: Listing of individual securities that are continuously traded in the Future Market from November 9, 2001 to March 31, 2019 (18 companies)

Data

The historical data for the study of the BSE Futures, Stock Futures and spot BSE, stock prices for the selected companies have been collected from official website of (BSE). The data comprises of time series data on 18 companies and one index from BSE of India. The daily closing price of the stocks and index are considered for the spot market, the near month contract has been used to analyze the stock and index future market. The data has been analyzed over a span of 17 years starting from November 9, 2001 to March 31, 2019.

Analysis

Descriptive statistics, Augmented Dickey-Fuller Test - Unit Root Test (ADF), Durbin-Watson Test, Autocorrelation function (correlogram), Ljung-Box Q test have been used. Autoregressive Integrated Moving Average model (ARIMA) has been used to identify the suitable model in which the movement of the prices of the spot and future stocks and Index fit.

5. Review of Literature

Ali, I. (2016) examined the relationship between returns and volatility, volatility clustering, leverage effect and the persistence of volatility for the Indian stock markets. The study is based on the daily closing index value of the S&P CNX Nifty of NSE and S&P Sensex of BSE in India and the study of the period from April 1, 2005- March 31, 2014 and the GARCH model is used. The author has been found that the volatility in both the markets exhibits the characteristics like volatility clustering, asymmetry effect and persistence of volatility in their daily returns and the recent news as well as past news both has an impact on volatility and also finds the existence of leverage effect indicating that the negative shock or bad news have more impact on volatility than that of positive shock or good news. However, the relationship between returns and volatility is not significant for both the markets.

Siddiqui, T. A., & Narula, I. (2017) investigated the existence of volatility base anomalies in Indian stock market, which are the result of various behavioural. The present study has employed various ARCH family models such as GARCH, exponential GARCH (EGATCH) and component GARCH (CGARCH) to appraise assorted nature of volatility patterns in Indian stock market. The authors have been found that herding endures in both bullish and bearish trend, whereas herding has amplified for Nifty and Small cap in bearish trend. Moreover, the existence of stock market inefficiency due to low volatility anomaly and outcomes pragmatically verified the persistence of volatility in long and short run and also assist in acknowledging the degree of subsistence of anomalies and biases in market uptrend's and downtrends in order to comprehend the level of rationality of investors in diverse market situations.

Panda, A. K., & Nanda, S. (2018) studied attempts to capture the return volatility and the extent of dynamic conditional correlation between the stock markets of North America region. The data contain weekly stock market returns spanning from the second week of 1995

to fourth week of June 2016. Used univariate ARCH and GARCH approaches, the results evidence of return volatility and it is persistence within the region and Maxican stock market neither reacts intensely to immediate market fluctuations nor the part of the realized past volatility spill over to the current period, whereas the stock markets of Canada and USA experience highly persistence of volatility and Bermuda stock market returns are high sensitive to the immediate market fluctuations. Used MGARCH-DCC, the authors have been found that emerging market are less linked to the developed market in terms of return and also exists a weak co-movement between the stock markets. Moreover, the correlations tend to spread out equally throughout the sample period but the co-variances were found to be more volatile during 2008-2010 and this study reveals that changes in co-movement are not due to a change in the correlations between markets but is simply due to volatility.

Maitra, D., & Dawar, V. (2019) investigated return and volatility spillover among commodity, stock and rate markets and used Vector Auto Regression (VAR) followed along with by Granger causality are to understand the causality of return. They had used multivariate volatility model to study the volatility co-movement of different assets. The found that unidirectional return spillover from the Multi Commodity Exchange (non-agro commodity) to stock indices and exchange rates and stock indices are found to influence exchange rates to returns. Equity markets have been found to have a return spillover on NCDEX (agro commodity) during the post crisis period. However, each asset market is found to have volatility spillover effects on the other asset market commodity indices have more spillover effect on stock.

Hou, Y., & Li, S. (2020) examined volatility and skewness spillover between Chinese stock index and futures markets during the market crash in 2015 and data of the China Securities Index (CSI) 300 stock index futures and spot during the stock market crash are collected and used generalized autoregressive conditional heteroskedasticity (GARCH) model. The authors found that the volatility spillover from futures to spot is significant and stronger than the other way around and the transmission of downside risk is bilateral with the futures market taking the lead and the announced during the market crash to curb the speculative futures trading appears to enhance the spillover of both volatility and skewness from futures to spot markets.

6. Data Analysis

There is no stationarity (Using ADF test and Durbin-Watson Statistic) for ACE Edutrend Ltd in the spot market

Stationarity for Share Price of ACE Edutrend Ltd in the Spot Market 1st Difference

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Particulars		t-Statistic	Probability
Augmented Dickey-Fuller test Statistic		-65.77686	0.0001
Test critical values	1% level	-3.431679	
	5% level	-2.862012	
	10% level	-2.567064	
Durbin Watson stat		1.999847	

Since the computed Augmented Dickey-Fuller (ADF) test statistics (-65.77686) is less than the critical values "tau" (-3.431679, -2.862012 and -2.567064) at 1%, 5% and 10% significant level, respectively) drawn from the above table. That means the ACE Edutrend Ltd series has no unit root problem and the ACE Edutrend Ltd series is stationary series.

This result is reliable because the Durbin-Watson Statistic is close to 2(1.999847) that means the ACE Edutrend Ltd series having autocorrelation stationary. Hence null hypothesis is rejected.

There is no stationarity (Using Ljung-Box Q test) for ACE Edutrend Ltd in the spot market

Autocorrelation of ACE Edutrend Ltd in the Spot Market Share price for 2nd difference

1	**AC**	**PAC**	**Q-Stat**	**Prob**
2	-0.498	-0.498	1073.4	0.000
3	-0.003	-0.335	1073.5	0.000
4	0.002	-0.251	1073.5	0.000
5	-0.002	-0.156	1073.6	0.000
6	-0.020	-0.163	1075.3	0.000
7	0.025	-0.125	1078.0	0.000
8	-0.001	-0.098	1078.0	0.000
9	-0.014	-0.102	1078.9	0.000
10	0.010	-0.087	1079.3	0.000
11	-0.012	-0.097	1079.9	0.000
12	0.005	-0.097	1080.0	0.000
13	0.010	-0.078	1080.4	0.000
14	0.010	-0.044	1080.8	0.000
15	-0.022	-0.057	1082.9	0.000
16	0.008	-0.052	1083.2	0.000
17	-0.004	-0.057	1083.2	0.000
18	0.002	-0.057	1083.3	0.000
19	-0.004	-0.064	1083.3	0.000
20	0.006	-0.060	1083.5	0.000
21	0.001	-0.056	1083.5	0.000
22	0.008	-0.035	1083.8	0.000
23	-0.019	-0.054	1085.4	0.000

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24	0.024	-0.025	1087.8	0.000
25	-0.024	-0.044	1090.3	0.000
26	0.013	-0.037	1091.1	0.000
27	-0.005	-0.042	1091.2	0.000
28	0.010	-0.025	1091.7	0.000
29	-0.003	-0.015	1091.7	0.000
30	-0.014	-0.031	1092.5	0.000
31	0.009	-0.030	1092.9	0.000
32	-0.006	-0.040	1093.0	0.000
33	0.016	-0.018	1094.1	0.000
34	-0.013	-0.026	1094.9	0.000
35	0.013	-0.007	1095.6	0.000
36	-0.024	-0.038	1098.2	0.0

It is observed from correlogram of ACE Edutrend Ltd share price for spot market the "second differenced" series that the Autocorrelation Function (ACF)is marked by presence of a singular significant spike at lag one with insignificant spike at all others lags and the Partial Autocorrelation Function (PACF) exhibit a dying out pattern of solid spikes over the extending lags. These features confirm "Stationary".

The significant value of autocorrelation co-efficient by using Ljung-Box Q test is 1098.2 which is greater than 51 $\chi 2$ value at (36, 0.05). Therefore, we rejected the null hypothesis that there is no autocorrelation up to lag 36 i.e. Stationary.

ARIMA for Share Price of ACE Edutrend Ltd in the Future Market

MODEL	AKAIKE INFO CRITERION
(0,1)	-3.722881
(1,0)	-3.722879
(0,0)	-3.722758
(2,0)	-3.722420
(0,2)	-3.722419
(1,1)	-3.722419
(0,3)	-3.722008
(3,0)	-3.722004
(2,1)	-3.721975
(1,2)	-3.721974
(2,2)	-3.721568
(0,4)	-3.721565
(4,0)	-3.721565
(1,3)	-3.721557
(3,1)	-3.721556
(4,2)	-3.721414
(2,4)	-3.721414
(2,3)	-3.721105

(4,1)	-3.721102
(1,4)	-3.721102
(3,2)	-3.721093
(3,3)	-3.720642
(3,4)	-3.720180
(4,3)	-3.720180
(4,4)	-3.71971

The above table shows the results of "Auto-Regressive Integrated Moving Average"(ARIMA) of ACE Edutrend Ltd for future market share price during the period of study. The best ARIMA model has been selected based on lower Akaike information criterion. The study period accept (0,2,1) ARIMA model.

There is no stationarity (Using ADF test and Durbin-Watson Statistic) for Bharat Forge Ltd in the spot market.

Stationarity for Share Price of Bharat Forge Ltd in the Spot Market 1st Difference

Particulars		t-Statistic	Probability
Augmented Dickey-Fuller test Statistic		-65.73357	0.0001
Test critical values	1% level	-3.431679	
	5% level	-2.862012	
	10% level	-2.567064	
Durbin Watson stat		1.999877	

Since the computed Augmented Dickey-Fuller (ADF) test statistics (-65.73357) is less than the critical values "tau" (-3.431679, -2.862012 and -2.567064) at 1%, 5% and 10% significant level, respectively) drawn from the above table. That means the Bharat Forge Ltd series has no unit root problem and the Bharat Forge Ltd series is stationary series.

This result is reliable because the Durbin-Watson Statistic is close to 2(1.99987) that means the Bharat Forge Ltd series having autocorrelation stationary. Hence null hypothesis is rejected.

There is no stationarity (Using Ljung-Box Q test) for Bharat Forge Ltd in the spot market

Autocorrelation of Bharat Forge Ltd in the Spot Market Share Price for 2nd difference

AC	PAC	Q-Stat	Prob
1 -0.498	-0.498	1173.4	0.000
2 -0.003	-0.335	1173.5	0.000
3 0.002	-0.251	1173.5	0.000

4	0.005	-0.193	1173.6	0.000
5	-0.002	-0.156	1173.6	0.000
6	-0.020	-0.163	1175.3	0.000
7	0.025	-0.125	1178.0	0.000
8	-0.001	-0.098	1178.0	0.000
9	-0.014	-0.102	1178.9	0.000
10	0.010	-0.087	1179.3	0.000
11	-0.012	-0.097	1179.9	0.000
12	0.005	-0.097	1180.0	0.000
13	0.010	-0.078	1180.4	0.000
14	0.010	-0.044	1180.8	0.000
15	-0.022	-0.057	1182.9	0.000
16	0.008	-0.052	1183.2	0.000
17	-0.004	-0.057	1183.2	0.000
18	0.002	-0.057	1183.3	0.000
19	-0.004	-0.064	1183.3	0.000
20	0.006	-0.060	1183.5	0.000
21	0.001	-0.056	1183.5	0.000
22	0.008	-0.035	1183.8	0.000
23	-0.019	-0.054	1185.4	0.000
24	0.024	-0.025	1187.8	0.000
25	-0.024	-0.044	1190.3	0.000
26	0.013	-0.037	1191.1	0.000
27	-0.005	-0.042	1191.2	0.000
28	0.010	-0.025	1191.7	0.000
29	-0.003	-0.015	1191.7	0.000
30	-0.014	-0.031	1192.5	0.000
31	0.009	-0.030	1192.9	0.000
32	-0.006	-0.040	1193.0	0.000
33	0.016	-0.018	1194.1	0.000
34	-0.013	-0.026	1194.9	0.000
35	0.013	-0.007	1195.6	0.000
36	-0.024	-0.038	1198.2	0.0

It is observed from correlogram of Bharat Forge Ltd share price for spot market the "second differenced" series that the Autocorrelation Function (ACF)is marked by presence of a singular significant spike at lag one with insignificant spike at all others lags and the Partial Autocorrelation Function (PACF) exhibit a dying out pattern of solid spikes over the extending lags. These features confirm "Stationary".

The significant value of autocorrelation co-efficient by using Ljung-Box Q test is 1198.2 which is greater than 51 $\chi 2$ value at (36, 0.05). Therefore, we rejected the null hypothesis that there is no autocorrelation up to lag 36 i.e. Stationary.

ARIMA for Share Price of Bharat Forge Ltd in the Spot Market

MODEL	AKAIKE INFO CRITERION
(0,1)	-4.722881
(1,0)	-4.722879
(0,0)	-4.722758
(2,0)	-4.722420
(0,2)	-4.722419
(1,1)	-4.722419
(0,3)	-4.722008
(3,0)	-4.722004
(2,1)	-4.721975
(1,2)	-4.721974
(2,2)	-4.721568
(0,4)	-4.721565
(4,0)	-4.721565
(1,3)	-4.721557
(3,1)	-4.721556
(4,2)	-4.721414
(2,4)	-4.721414
(2,3)	-4.721105
(4,1)	-4.721102
(1,4)	-4.721102
(3,2)	-4.721093
(3,3)	-4.720642
(3,4)	-4.720180
(4,3)	-4.720180
(4,4)	-4.719713

The above table shows the results of "Auto-Regressive Integrated Moving Average" (ARIMA) of Bharat Forge Ltd., for spot market share price during the period of study. The best ARIMA model has been selected based on lower Akaike information criterion. The study period accept (0,2,0) ARIMA model

8. Findings

1. It was found that 17 out of 18 companies and BSE were positively skewed (Except ACE Edutrend Ltd.) both in Spot Market and Future Market. The co-efficient of skewness being positive in all the period for shares and Index states that the data is normal.
2. It was found that 9 out of 18 companies Kurtosis values leptokurtic to the normality which means there is a possibility for risk of extreme outcomes, thus distribution is not normal (both in spot and future market).
3. It was found that 9 out of 18 companies and BSE Kurtosis value were platy kurtic thus this distribution is normal (both in spot and future market).
4. Jarque-bera test statistics shows that value is far from the ideal value (skewness is zero and excess kurtosis is zero) and thus this distribution is not normal for all companies and BSE (both in spot and future market).

5. It was found that 10 out of 18 companies and BSE time series attain stationary at first differencing.For these companies ADF test statistics were less than critical values "tau" (at 1%, 5% and 10% significant levels) and Durbin Watson statistics value closes to 2. It shows that the series were stationary (both in Spot and Future markets).
6. It was found that 8 out of 18 companies Time Series got stationary only at 2nd differencing for these companies ADF text statistics were less than critical values "tau" (at 1%, 5% and 10% significance levels) and Durbin Watson statistics value closes to 2. It shows that the series were stationary (both in Spot and Future markets)
7. It was found that all 18 companies and BSE the Autocorrelation Function of series is free from any dying out pattern of Spikes and partial Autocorrelation function of Series is marked by absence of any singularly significant spike at lag one. These features confirm series were stationary (both in Spot and Future markets).
8. It was found that value of autocorrelation coefficient by using Ljung Q test were greater than critical values for all 18 companies and BSE. It also supports the result that series were Stationary (both in Spot and Future markets).
9. 8 out of 18 Companies (Aagam Capital Ltd., Aanchal Ispat Ltd., Advik Capital Ltd., B&A Ltd., Bharat Forge Ltd., CAMEX LTD, CHL Ltd., D & H India Ltd.) had similar ARIMA Model both in Spot and Future market. Remaining 10companies had different ARIMA models in Spot and Future markets.
10. ARIMA Model is able to model and forecast the Volatility of 4 Companies (Aagam Capital Ltd., Bharat Forge Ltd. CHL Lt, D & H India Ltd) in the Spot Market better than the other competing models.
11. ARIMA Model is able to model and forecast the Volatility of 2 Companies (CAMEX LTD, Advik Capital Ltd.) and BSE in the Spot Market better than the other competing models.
12. ARIMA Model is able to model and forecast the Volatility of 3 Companies (Grasim Industries Limited, Hindalco Industries Limited and ITC Limited) in the Future Marketbetter than the other competing models
13. ARIMA Model is able to model and forecast the Volatility of 3 Companies (Aanchal Ispat Ltd., Advik Capital Ltd., B&A Ltd.,) in the future Market.

9. Conclusion

In the Last two decades, significant policy initiatives are undertaken in the field of industry, trade, exchange rate, foreign investment and in financial sector. These policy measures have influence on the functioning of stock market and behavior of stock prices. Volatility in the stock market has important bearing on earnings of individual investors and the efficiency of stock in general for

channelizing resources for its productive uses. Present study attempts to get insight into behavior of the volatility in Indian Stock Market.

The results of the present study show that both the Stock markets and Future derivative exhibit the characteristics with respect to the stylized features like Autocorrelation, Volatility clustering, asymmetry and persistence in its daily return. Results of the study revealed that the ARIMA model satisfactorily explains volatility and is the most appropriate for the series under analysis.

The model with large value of lag coefficient shows that the volatility in the both markets is highly persistent and is predictable. Using ARIMA model the investor can predict the spot and future market prices. To a certain extent, it represents the overall trend of spot and futures market prices and the forecasting results have some reference value for investors.

Therefore investors can refer to the model established in this study to build their own portfolios. The investor should kept mind that model suggested in this study is established on the market is effective and the financial market history will repeat itself. When the market is affected by national policies, impacted of domestic and foreign economic situation and other external shocks, the market will fluctuate violently and it is conceivable that the suggested model will not be effective.

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TECHNOLOGY INTEGRATION AND FINANCIAL PERFORMANCE OF SELECTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

The aim of this study is to analyze the effect of technology integration on financial performance of deposit money banks (DMBs) in Nigeria. A total of 150 randomly selected employees from 11 different DMBs in Nigeria were surveyed, out of which 112 were retrieved, giving a response rate of 74.7%.The research used descriptive statistics, exploratory factor analysis, and ordinary least square. The study found that financial technology($\beta = 0.224$, $t= 2.320$, $p<0.05$) has a positive and significant effect on the financial performance of DMBsin Nigeria. The research concludes that the use of financial technology tools and financial technology are strong predictors of financial performance of the Nigerian deposit money banks. On the policy front, it becomes imperative for banks to launch a vigorous campaign and reorient their clientele in order to increase their clientele's use of banking services, particularly automated teller machines (ATMs), universal short message service (USSD) banking, online banking, point-of-sale (POS), mobile banking, among others. This means that the profits from investing in these financial technology tools may be consolidated and the DMBs' performance can be improved.

Keywords: Financial technology, technology integration, financial performance.

1. Introduction

During the past few decades, innovations and improvements in the information and communication technology (ICT) industry have played active and crucial roles in reshaping how banks deliver their services to their consumers. Online transfer payment, online financial planning services, and online lending and borrowing through a peer-to-peer system are just a few examples of the novel technologies made possible by the widespread adoption of ICT in the banking sector (Navaretti*et al*.,

2017). The banking system's ability to provide novel approaches to addressing client concerns is partly attributable to the disruptive power of the integration of financial technology.

According to Iluba and Phiri (2021), the banking sector has experienced significant growth and inventive potentials as a result of the incorporation of technology. Open Banking was created as a result of this kind of interaction. The use of financial technology to provide banking services is influenced by a variety of elements in the banking industry. Some of these factors include the quantity of secure internet servers, mobile phone subscriptions, research and development, training, collaboration with other businesses, as well as the size of the company and the availability of technically trained workers.

Banking services have become more responsive and user-friendly as a result of the use of technology into the banking sector. A wide range of opportunities abound in the field of financial technology. To begin, it is worth noting that many financial institutions are developing their own in-house financial technologies in an effort to fully embrace technological advancements in all areas of their operations. This has opened up new opportunities in the financial sector, such as the provision of mobile banking services by banks in the Diaspora, which in turn has bolstered the development of novel digital banking platforms. Automatic Teller Machines (ATMs), Credit Cards, Mobile Phones, and Internet Banking are all examples of Financial Technology products (Goldstein, Jiang and Karolyi, 2019). The need for financial services that meet the specific requirements of individual consumers is growing. Banks must adapt to the changing digital landscape by establishing financial technology firms that include asset management and insurance providers.

Banerjee (2020) emphasized the necessity to increase the success of financial technologyin order to achieve efficient and effective bank performance in the financial industry. Consumers are benefiting from this advancement and the banks needs to keep up with the evolving technology to provide the best service for its consumers in the long run. However, investment in the Financial Technology sector is rapidly increasing and the financial technology industry especially startups faces technological, legal and regulatory challenges and unexpected events. Over the past eight years, Nigeria received US$204 million in FinTech investments. By the end of 2018, Nigerian FinTechs had raised about US$103.4 million. As of 2018, about 38% of Nigeria's adult population, which numbers over 99 million people, were financially excluded (Hidayat*et al*., 2022).

In other words, nearly 30 million grown-up Nigerians do not have access to or make use of any kind of formal or informal financial services or products. Meanwhile, more Fintech integration could assist enhance access to financial services for Nigerians. The question is, to what extent have deposit money banks integrated technology into the delivery of financial services and are there obstacles that limit their integration of these technologies? Is the integration of technology beneficial to banks and does it improve their financial performance, given the high costs associated with introducing and maintaining

the technology, even though the CBN is benefiting from it by driving their cashless policy and businesses from having easier access to lending facilities and bank customers from having easier access to financial services?This calls for research into how technological integration affects the financial performance of Nigerian deposit money banks. So, the purpose of this research is to investigate how the adoption of new technologies affects the financial performance of Nigerian deposit money banks. This research provides answers to the following question: What impact does financial technology have on the profitability of Nigerian deposit money banks?

Apart from the introductory part, the second section of the study describes the literature review and research framework. Section 3 of the paper presents the methodology, which includes the model formulation, variables, and data. Section 4 will contain the results and a discussion of the findings, and Section 5 will contain the conclusion and recommendation.

2. Literature Review

2.1 Financial Technology (Fintech)

The banking industry since its inception has experienced landmark changes that brought about paradigm shifts in delivering banking services to the general public. In recent decades, the banking system especially the payment methods have experienced a wide range of digitalization and evolution. With the evolution, comes the introduction of technology into the provision of financial services by deposit money banks. While it has been almost impossible to agree on a single and generally accepted definition of financial technology, world Economic Forum defines financial technology as companies that provide or facilitate financial services by using technology. In its current form, Fintech is marked by technology companies that dis-intermediate formal financial institutions and provide direct products and services to end users, often through online and mobile channels. The PWC (2017) defined Fintech as a dynamic segment at the intersection of the financial services and technology sectors where technology-focused start-ups and new market entrants innovate the products and services currently provided by the traditional financial services industry.

2.1.2 Application of Financial Technology

Financial Technology (Fintech) makes the world more inclusive regardless of whether transactions are C2C (customer-to-customer) or B2B (business-to-business). Fintech integration has made international money transfers easier than ever. Thus, Fintech companies attract enormous venture capital investment worldwide to develop and create new financial technology products (FTPs) (Gupta and Mandy, 2018). The purpose of Financial Technology (Fintech) is to enhance service quality and work efficiency of financial services by using information technology applications. Fintech can also be used in P2P (peer-to-peer) lending, distributed ledger technology and third-party payment (Gai,Qiuand Sun, 2018).Fintech products (FTPs) are one form of Fintech leading the financial sector

towards digital banking and suppressing the traditional banks (FSB, 2019).The application of Financial Technology (Fintech) can be evident in investment management, mobile banking, payments and remittances, credit facilities, savings and deposits.

2.2 Bank Performance

2.2.1 Bank Performance Measurement

The selection of performance measurements is one of the most critical challenges for organizations. Performance measurement systems play a vital role in the improvement of strategic plans, the achievement of organizational targets estimation and compensation. In the banking sector, the quality of administration data, installation of modern technologies, the innovation of banking products and services, competitive cost structure, risk management, extensive information system, prominence of strategic planning and equity endowment are the most critical determinants for productive and successful performance (Pattanasak*et al*., 2022).Performance measurement and accounting systems are used to understand past behaviour, as well as for accurate decision-making regarding current issues and planning and forecasting the future. Performance of deposit money banks can therefore be measured in two categories namely: financial and non-financial performance.

Haralayya and Aithal (2021) argued that generally argues that the financial performance of a firm provides an insight into the asset utilization and the company's ability to generate revenue from its operations. Profitability ratios are used to determine an organization's capability in gaining profits. Other measures include turnover, strong cash flow(Fatihudin, 2018).

2.3 Theoretical Review

2.3.1 Technology Acceptance Model

This model was originally put forward by Davis in 1986 to expound on the attitude behind the urge to employ technological knowhow.TAM deals with perceptions and not systems real usage and argues when new technological advancement is introduced to the customers, either one of this occurs that is, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) influence their decision (Grover *et al*. 2019).PEOU is the level of confidence that people put on a system and if users perceive a new technology to be beneficial in support of both short and long-run, there is that encouragement to use the system. Further, the level by which an individual considers a system will boost performance in the short and long-run is the PU (Kodongo, 2018).The TAM affirms that the systems real utilization is established by each user's behavioral intention for usage and is inspired by an individual's perception to the system. Maqbool (2018) added that the theory explains that the perception towards new technology has a direct relation to its functionality as well as the simplicity of the system. TAM considers that acceptance of technology and functionality is influenced by consumer's intentions that establish the customer's perception towards system.The theory also supports that the recognition or

suspicions about the advancement are instrumental in the improvement of states of mind that will in the long run result in system usage conduct (Grover *et al*., 2019).

2.4 Reviewed of Empirical Studies

As a result of the worldwide acceptance of financial technology, several scholars have examined its growth and impact on the performance of the banks both in developing and developed countries. In Nigeria, some studies including that of Legowo, Subanidja and Sorongan(2021) and Stoiko (2020) both examined the introduction of electronic banking and its effect on bank profitability in Nigeria. It was found that ATM transactions play a significant role more than other channels on the performance of banks in Nigeria. In a related study, Sen and Jijan (2020)explored the evolution of Banking from Retail to Mobile Banks and FinTech.Findings from the study posited that the future of banking is characterized by innovative services and products offered online which, however, would need to be supported by a regulatory framework, able to eliminate entry barriers for newcomers in the banking sector.

Yin(2021) also studied the Fintech evolution in Nigeria achieving double bottom line impact through innovation and entrepreneurship and found that FinTech's performance in Nigeria impacts the ecosystem economically and socially in three broad dimensions: through stimulating economic activity, by creating a multiplier effect, and by driving progress towards development goals. In another study by Sadekin*et al*. (2019), it was argued that financial technology (Fintech) innovations have positively influenced the return on Equity of commercial banks in Nigeria. They narrowed down to electronic banking citing that more customer transactions are observed and hence more transaction fees leading more revenues.

On the impact of emerging technologies on performance of banks, Mabrouk andMamoghli (2018) considered the use of ATMs, Mobile banking and other technological mechanisms that facilitate the banking process. They established that those banks that adopted innovations earlier had superior performance when compared to those that adopted much later. A study on financial innovation revealed that most of the financial innovations have a positive effect on income generating potentials of banks. It was noted that the diffusion of financial innovation is more determined by customer's acceptance than by the seller offerings (Ejike, 2019).

2.5Theoretical Framework

The framework of this study is based on the technology acceptance theory introduced by Davis in 1989 which explains technology user acceptance behaviour. The theory proposed that technology acceptance (integration) depends on perceived ease of use and perceived usefulness, attitude and behavioral intention to use. It is however believed that the perceived usefulness and perceived ease of

use forms the end-user's beliefs on a technology and therefore predict his or her attitude towards the technology, which in turn predicts its acceptance.

Integration of Technology = *f*(perceived usefulness and perceived ease of use) (1)

The major explanation provided by this theory is that for financial technology to be integrated, it must gain wide acceptance by users and this will be based on the ease of use (Madugba*et al*., 2021). It therefore implies that if financial technology gains wide acceptance, then its integration will be high and as such it will have a form of influence on performance of the organization. Hence, among the determinants of the performance of an organization the extent to which financial technology have been integrated which can be expressed implicitly as:

Financial Performance = *f*(financial technology integration) (2)

3. Methodology

3.1 Research Design

This study employed the survey research design which focused on data collection with the aid of questionnaire. This has the ability to collect large amount of data in a population-based research. This method is used because it ensures a coherent research instrument for gathering data and generating information that will be drawn on the study. The use of questionnaire in this study allows for respondent to disclose their perception on current and emerging issues with respect to financial technology and financial performance of deposit money banks in Nigeria. It is also faster and relatively inexpensive to use.

3.2 Population of the Study

The target population include the twenty-four (24) deposit money banks listed by the central bank of Nigeria with both local and international authorization as at June 2021.This study uses a sample of eleven (11) deposit money banks with both local and international authorization. The simple random sampling technique was used to select the needed sample from the population, this is because simple random sampling is objective and unbiased.

3.3 Description of Research Instrument

The Research Questionnaire consist of sections A to E. Section A focused on the essential demographic characteristics of the respondents, while Section B focused on financial services provided by deposit money banks in Nigeria, section C contains questions with regard to financial technology and the extent to which it has been integrated, section D focused on financial performance of deposit money banks in Nigeria.Each question of the questionnaire from Section B to D were structured in Likert Scale which required the respondents to grade their options on a scale of 1–5. The

questions had scaled responses as of Very Large Extent (coded 4), Large Extent (coded 3), Some Extent (coded 2), Minor Extent (coded 1) and Not At All (coded 0).

3.4 Model Specification

The general model of this study is founded on the theoretical framework specified by equation (1) above. This is in line with the objective of the study which is to examine the effect of technology integration on financial performance of deposit money banks in Nigeria. The functional relationship is expressed as below

$$FP = f(\text{Financial Technology}) \quad (3)$$

Where:*FP* is the financial performance of deposit money banks. To achieve the objective of this study, five (5) financial technology tool will be used as a measure of financial technology which is in line with past studies (Okpara, Ikpefan and Aigbiremolen, 2018;Keskar and Pandey, 2018). The equation (3) can then be re-expressed as;

$$FP = f(\text{ATM, POS, IB, MB, USSD}) \quad (4)$$

This can be expressed in estimable form as follows

$$FP = \alpha_0 + \alpha_1 ATM + \alpha_2 POS + \alpha_3 IB + \alpha_4 MB + \alpha_5 USSD + \varepsilon \quad (5)$$

Where,FP = financial performance of deposit money banks in Nigeria, *ATM* = Automated Teller Machine, *POS* = Point of Sales, *IB* = Internet Banking, *MB* = Mobile Banking, *USSD* = Unstructured Supplementary Service Data, α_0 = Constant term, $\alpha_{1\text{-}5}$ = coefficient of the variables, ε = error term.

3.5 Method of Data Analysis

To achieve the objectives of this study, the descriptive and inferential analysis. Descriptive analysis was carried out to show the demography of the respondents and give insightful information regarding the distribution of the respondents. The data for the study was analyze using version 26 of the SPSS (Statistical Package for Social Sciences) software.

4. Results and Discussion of Findings

4.1 Demographic Data Analysis

For the purpose of this study, 150 participants from 11 selected deposit money banks in Nigeria were considered, out of which 112 responses were retrieved. The respondents comprise of both male and females. It was revealed that majority of the participants were females represented by 52.5% while the male respondents were 47.5 %. In terms of marital status of the respondents, majority are married (68.9%) followed by those that are single (29.2%) while those that are divorced and separated are represented by 0.9% each. With regards to education, majority of the participants are HND/B.Sc holders (71.3%) followed by M.Ed./M.Sc. (16.7%) and NCE/OND (8.3%), while the least represented were the PhD holders with 3.7%. In terms of age, the age range with the highest participation is those

between 26 to 35 with 51.4% followed by those that falls within the range of 36 to 45 with 27.1%. Those that are within the range of 18 to 25 are 15% while the least are those above 46 years of age (6.5%). In addition, it was also discovered that majority of the respondent are still relatively new at their respective banks as participants with 1 to 3 years work experience account for 31.8%, followed by 22.7% of those with 4 to 6 years work experience in the banking industry. Those that have more than 10-year work experience were 19.1% followed by those with 7 to 10 years (15.5%), while the least represented were those with less than a year (10.9%).

4.2 Investigation of the Effect of Financial Technology on the Financial Performance of Deposit Money Banks in Nigeria

In line with the second objective of this study which seek to investigate the effect of financial technology on the financial performance of deposit money banks in Nigeria, the study employs exploratory factor analysis (EFA) using the principal components analysis (PCA). The EFA method is used to condense the information contained in a large number of variables into a number of information or factor loading. The statistical purpose of this technique is to determine the combination of variables that will help summarize the data and identify underlying relationships. It also collectively analyse all variables under investigation to identify underlying factors. This is carried out using principal component analysis which is a variable reduction technique with the aim of reducing a larger set of variables into a smaller set of 'artificial' variables, called 'principal components', which account for most of the variance in the original variables. However, this method is subject to some assumptions, as a result, the following pre-test was carried out on the whole questionnaire.

4.2.1 Correlation

The correlation matrix result produced a huge correlation table, which was recorded in the appendix of this study. Factor analysis checks for relationships between the data, the expectation is that there should be at least some moderate-to-high correlations in the data (for instance correlations above the value of r=0.3). As seen in the result of the correlation matrix for integration of financial technology, constraints to the integration of technology and financial performance of deposit money banks in Nigeria shows that there are several moderate correlations which suggest that the analysis is appropriate. However, in order to avoid multicollinearity in factor analysis, any variable with a very high correlation of r>0.9 should be removed. From the result in this study, there are no variables with r>0.9 which indicate the absence of multicollinearity. However, further test needs to be carried out to test the strength of the correlation.

4.2.2 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

Table 1: The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

Variables	KMO Test	Bartlett's Test	
		Approx. Chi-Square	Sig
ATMs	0.809	159.767	0.000
Internet Banking	0.693	80.883	0.000
POS	0.719	141.127	0.000
Mobile Banking	0.665	118.612	0.000
USSD	0.691	174.930	0.000
Constraints	0.860	1147.105	0.000
Financial Performance	0.835	318.501	0.000

Source: Author's Computation (2022)using SPSS 26.

The result of Kaiser-Meyer-Olkin measure of sampling adequacy was for all the variables as presented in the table1 shows that all the variables are within the acceptable values of 0.5 and 1. This implies that there is a strong partial correlation among the variables. In addition, the Bartlett's test of Sphericity was used to test whether the correlation matrix is the same as the identity matrix. The purpose of this is to make sure that the correlation matrix of the variables in the datasets diverges significantly from the identity matrix, so that we know a data reduction technique is suitable to use.A significant statistical test is expected to be below 0.05 to show that correlation matrix is indeed not an identity matrix which means rejection of the null hypothesis. The Bartlett's Test of Sphericity in this study is less than 0.01 for all variables of interest. With the results meeting the assumptions of the principal components analysis (PCA) test, this means that PCA test can therefore be carried out with reliable result.

4.2.3 Extracted Factors and Percentage of Variance

For each of the variables, factors were extracted and labeled. This includes ATMs, internet banking, POS, mobile banking and USSD as well as financial performance (PERF).Having determined the factors/variables for this study, the hypothesis can therefore be tested. The hypotheses in this study presumed that financial technology has no significant effect of financial performance of deposit money banks in Nigeria and constraints to technology integration has no significant effect on financial performance of deposit money banks in Nigeria. To test this, a multiple regression was conducted to establish the significant level of the impact financial technology and constraints to integration of technology on financial performance of deposit money banks in Nigeria.

Table 2: Result of the Investigation of the Effect of Financial Technology Tools on the Financial Performance of Deposit Money Banks in Nigeria

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R-Square	Collinearity Statistics	
	B	Std. Error	Beta					Tolerance	VIF
(Constant)	0.006	0.089		0.064	0.949	0.487	0.237		
Automated Teller Machine (ATMs)	0.349	0.092	0.349	3.778	0.000			1.000	1.000
Internet Banking	0.360	0.092	0.358	3.909	0.000			1.000	1.000
Point of Sales (POS)	0.268	0.095	0.266	2.813	0.006			1.000	1.000
Mobile Banking	0.171	0.096	0.170	1.770	0.080			1.000	1.000
Unstructured Supplementary Service Data (USSD)	0.207	0.096	0.206	2.147	0.034			1.000	1.000

Source: Author's Computation (2022) using SPSS 26.

The result of the multiple regression, estimating the effect of financial technology tools on financial performance of deposit money banks in Nigeria was reported in the table 2. The result shows that there is a positive and moderate association between the five financial technology tools (ATMs, Internet Banking, POS, Mobile Banking and USSD) and financial performance of deposit money banks in Nigeria ($r = 0.49$, $p < 0.01$). These financial technology tools also collectively explain 23.7% of the variation in the financial performance of deposit money banks in Nigeria.

The coefficient results reported in table 2 shows that each of the financial technology tools (ATMs, Internet Banking, POS, Mobile Banking and USSD) have a positive and significant effect on financial performance of deposit money bank in Nigeria. Although, ATMs ($\beta = 0.349$), internet banking ($\beta = 0.360$) and POS ($\beta = 0.268$) are significant at 1% level of significance, while mobile banking ($\beta = 0.171$) and USSD ($\beta = 0.207$) are significant at 10% and 5% level of significance respectively.

The implication of this is that the financial performance of deposit money banks in Nigeria will improve by 34.9% as a result of improvement in integration of ATMs, 36% as a result of improvement in integration of internet banking, 26.8% as a result of improvement in integration of POS, 17.1% as a result of improvement in integration of mobile banking and 20.7% as a result of improvement in integration of USSD. Table 2 further reported the test for multicollinearity using the variance inflation factor (VIF) which is less than 3 (VIF = 1) for each of the financial technology tools. This means there is an absence of multicollinearity in the model.

Table 3: Result of the Investigation of the Effect of Financial Technology on the Financial Performance of Deposit Money Banks in Nigeria

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R-Square	Collinearity Statistics	
	β	Std. Error	Beta					Tolerance	VIF
(Constant)	0.002	0.097		0.025	0.980	0.224	0.050		
Financial Technology	0.224	0.096	0.224	2.320	.022			1.000	1.000

Source: Author's Computation (2022) using SPSS 26.

The regression result estimating the impact of overall financial technology on the financial performance of deposit money banks in Nigeria is presented in Table 3. The result indicated that there exist a positive but weak correlation between financial technology and financial performance of deposit money banks ($r=0.224$, $p<0.05$). It was also discovered that financial technology account for 5% of the variation in the financial performance of deposit money banks in Nigeria. This implies that there several other factors that account for the financial performance of deposit money banks in Nigeria.

The coefficient results reported in Table 3 shows that there is a positive and significant impact of financial technology on the financial performance of deposit money banks in Nigeria ($B= 0.224$, $t= 2.320$, $p < 0.05$). The implication of this is that an improvement in the financial technology integration in providing financial services by deposit money banks will improve financial performance by 22.4%. The table further reported the test for multicollinearity using the variance inflation factor (VIF) which is less than 3 (VIF = 1). This means there is an absence of multicollinearity in the model.

4.3 Discussion of Findings

This study investigated the impact of technology integration on financial performance of deposit money banks in Nigeria. The result of the multiple regression, estimating the effect of financial technology tools on financial performance of deposit money banks in Nigeria. showed that there is a positive and moderate association between the five financial technology tools (ATMs, Internet Banking, POS, Mobile Banking and USSD) and financial performance of deposit money banks in Nigeria ($r = 0.49$, $p <0.01$). These financial technology tools also collectively explain 23.7% of the variation in the financial performance of deposit money banks in Nigeria.

The study further tested the effect of financial technology on financial performance of deposit money banks in Nigeria. It was found that there exist a positive but weak correlation between financial technology and financial performance of deposit money banks ($r=0.224$, $p<0.05$). It was also

discovered that financial technology account for 5% of the variation in the financial performance of deposit money banks in Nigeria. This implies that there several other factors that account for the financial performance of deposit money banks in Nigeria. Improvement in integration of technology to provide financial services, financial performance of deposit money banks will improve by 22.4%. Banks should therefore focus more on integrating technology and encouraging the use of the adopted technology by customers as this will boost their performance.

This finding is in line with the result of other scholars who have investigated similar objectives. Similar result was found by other scholars which support that ATM has a positive and significant association with Earning EPS and ROA; POS and NEFT significantly affect ROA, while WEB has an insignificant impact on both EPS and ROA. This imply that electronic banking significantly affects financial performance of deposit money banks in Nigeria (Anigbogu, 2013; Chung and Paynter, 2002;and Edwin, Okpara, Ikpefan and Aigbiremolen, 2014).

5. Conclusion

The purpose of this research was to determine how much of an effect the increased use of technology has on the performance of deposit money banks. The effects were examined and determined using descriptive statistics, correlation, exploratory factor analysis, and regression models. The impact of financial technology and technological instruments on financial performance was proven to be positive and significant. Financial technology tools and financial technology as a whole were found to be major determinants of financial success of deposit money banks in Nigeria, which is consistent with the study's findings.

On the basis of the findings of this study, it was recommended that deposit money banks should embark on aggressive campaign and re-orientation of clients to create awareness for the customers to patronize the facilities especially in the area of use of ATMs, USSD, Internet banking, POS, mobile banking and others because increasing acceptance and use of these financial technology tools will consolidate the gains from investing in them and improve the financial performance. Deposit money banks should ensure cybersecurity as related to internet and mobile transactions and improve safety measures to protect customer details during and after online transactions.

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PERCEPTION OF PROSPECTIVE TEACHERS' ON ICT INTEGRATION IN TEACHING-LEARNING AND ASSESSMENT AT SECONDARY LEVEL

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Abstract

The purpose of this article was to investigate how future secondary school teachers in Tripura (n=90) feel about using ICT in the classroom. The current study, which used a descriptive survey research approach, aimed to investigate how future educators view the incorporation of ICT in pedagogy, and assessment. The study found that future educators had a favorable impression of using ICT for instruction, learning, and evaluation. In terms of integrating ICT into teaching and learning, there was no statistically significant difference between male and female prospective teachers, whereas there were differences between male and female prospective teachers in integrating ICT into assessment at secondary level. The study also suggested that this new approach of teaching and assessment is one of the core skills among the prospective teachers in views of 21st century teachers.

Keywords: ICT Integration, Perception, Prospective Teachers, Teaching- Learning Process and Assessment.

Introduction

Secondary education is the bedrock of each nation's school system. The next step for those who have completed secondary school is to figure out how they want to make a difference in the world. The instructors represent secondary-level expertise in a wide range of fields. Educators may choose to present information in a variety of ways, including but not limited to: lectures, demonstrations, lectures combined with demonstrations, heuristics, projects, case studies, or laboratory methods; demonstrations using technology, such as web-based entertainment; educational technology medium, such as audio, visual, and global media; or the incorporation of information and communication technology.

ICT coordinates showing gaining and appraisal currently function very differently than they did in the past as a result of the rapid development of technology. Over the past few decades, the effect of ICT on education and national progress has been accounted for. The schedule is a document that specifies not only the clear goals for each stage, but also the precise topics to be covered and the skills, knowledge, and mindset to be consciously acquired. NCERT advocates for uniformity in all areas of

Indian education. The National Curriculum Framework (NCF) gives each state the choice of adopting/modifying the NCERT timetable or advocating their suitable plan. The National Curriculum Framework for 2005 states that schools should encourage students to cultivate traits like curiosity, originality, objectivity, risk-taking, question-posing, and a sense of style. Subjects taught in secondary school (Classes IX and X) would primarily focus on helping students develop problem-solving and decision-making skills through exposure to universal scientific principles.

Gestalt psychologists (Köhler, 1940) referred to this problem as the Hoffding function. It was named after the Danish psychologist Harald Hoffding, who was active in the 19th century. He questioned if perception is as simple as establishing a connection between visual input and memory storage (associations). A famous and divisive theorist, James J. Gibson called into question the value of ties between things (1904–1980).

Gibson's theory of direct perception states that all that is needed to have a perceptual experience is the information available to our sensory receptors, including the sensory context. We get everything we need to perceive from our surroundings, hence this viewpoint is also called ecological perception. What this means is that neither our senses nor any higher-level cognitive processes are necessary for us to form an interpretation of what we take in through them. A person can perceive without having any sort of belief system in place or any kind of inferential reasoning abilities.

According to Gibson, in the actual world, one usually has enough background information to form sound judgements based on sensory input. He argued that there is no need for more sophisticated AI to explain consciousness. Gibson (1979) argued that it was important to make direct use of this background knowledge. Overall, it's built into our biological make-up for a reason. Gibson suggests that we use changes in texture to determine spatial depth. As a result of these cues, we are better able to gauge the distance between objects and their constituent parts.

For varying amounts of time, the federal government has formed many commissions and committees whose purview includes the development of instructional methodologies for use in K-12 settings. During its tenure (1964–1966), the Education Commission (Kothari Commission) greatly advanced its knowledge of India's educational system. In order to aid students in comprehending the material, TLM and other teaching techniques were implemented. The National Curriculum Frameworks of 1975, 1988, 2000, and 2005 all advocated for a more hands-on, inquiry-based science curriculum, more active learner participation in the construction of their knowledge, and the use of technology to spark students' interest. Both NPE (1986) and POA (2001) advocate for the use of technological tools in education to aid in the instruction, assessment, and preparation of both current and future educators (1992). Using information and communication technology (ICT) in classrooms is now a priority of the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) (RMSA-2009). As such, it has suggested developing educational situations. Using ICT to improve education changes the perspective of both parents and educators, as stated in the National Policy on ICT in School Education (2012). The CABE

also discussed the convergence of technologies in its 2005 report on mandatory secondary education. There has to be a comprehensive review of all ICTs with potential for improving education across the country. Only with the support of a solid policy can schools make an informed decision about how best to use information and communication technologies to advance education as a whole. The push to establish ICT policies in schools was motivated by the vast potential of ICT to increase access and improve quality of education.

The ways in which educators view, think about, and conceptualise their pupils are shaped by their own experiences and worldviews. They may meet people because of where they live, what they do for a living, what they study, what their families do, or what traditions they observe. These and other elements influence how a person interprets their surroundings and the people in it. Perception is crucial due to the fact that it reflects how a person is seen by the various people around them.

Institutions of higher education are under constant pressure from students, parents, and administration to adopt a more ICT-based approach to instruction, assessment, and student skill development. This is essential in the 21st century. Due to the widespread recognition of the transformative potential of ICT in the modern classroom, an increasing number of schools are mandating its use in the classroom. Institutions are also working to adapt educational curricula and classroom infrastructure to address the existing technology divide in teaching and learning (Buabeng-Andoh, 2012). There are several benefits to using technology in the classroom. Information and communication technologies (ICTs) simplify access to credible sources and aid students in conceptualising complex ideas (Qing, 2007). Using technology in the classroom increases students' motivation and sense of competence (Torff & Tirotta, 2010). Another benefit of computer use in the classroom is improved student achievement (House, 2012; Mercier &Higgins, 2013). It's simple for educators of any grade level to create online group projects for their students to work on together. Given the obvious importance of ICTs to education, teachers should take the initiative to integrate them into their classrooms. There are a lot of factors affecting this procedure. These features have developed during the past century to the present day. The extent to which teachers successfully incorporate ICTs into instruction is influenced by organisational characteristics, educators' attitudes toward technology, and other factors (Chen, 2008; Tondeur, Van Braak, & Valcke, 2008; Lim & Chai, 2008; Clausen, 2007). Several factors, including a person's disposition toward computers and their age, gender, level of education, and prior work or school experience with computers, can affect the likelihood of their adopting a new technology (Schiler, 2003). Such as Tondeur, Valcke, and Van Braak (2008) found that male teachers were more likely to use and positively view ICTs in the classroom. The success of incorporating ICTs into the classroom is influenced in part by teachers' perspectives and beliefs about the role of technology in education (Hew & Brush, 2007; Keengwe & Onchwari, 2008). If teachers have positive attitudes regarding the use of educational technology, they will have an easy time explaining how to embrace and incorporate ICTs into the classroom. Teachers' perspectives on the usefulness of technology in the

classroom have been found to have an effect on how much teachers use the tool and how successfully it is integrated into lessons (Huang & Liaw, 2005).

This study's title, "Perception of Prospective Teachers on ICT Integration in Teaching, Learning, and Assessment at Secondary Level," reflects a societal need. Those in the community are looking for a school that is accepting of their kids and also provides some sort of information and communication technology (ICT) infrastructure. A teacher is the same way; he or she has biases and preferences towards the students in their classroom. When teachers have high expectations for their students, the students tend to live up to those standards. When teachers have low expectations for their students, on the other hand, those students tend to underachieve. All of them are within the scope of this research. So, the study's goal is to learn how prospective teachers in Tripura feel about the use of technology in the classroom and how they judge the quality of instruction and student growth in secondary schools where ICT is integrated into the curriculum and pedagogy.

Rationale of the Study:

According to neuroscientific research, direct perception may also contribute to our social perceptions. Mirror neurons light up when one does a task and then sees another person complete the same task. And studies have shown that the lateral occipital region of the brain has its own set of circuits (what circuits?) for analysing shape, colour, and texture. In order to get insight into these fields, numerous studies have been conducted. Some of them are listed below.

In 2021, Thanavathi surveyed professors to find out how they felt about digital media tools. Many problems were uncovered during the study, including a shortage of qualified educators, a large student body, high teacher and student attrition rates, and inadequate curricula. Giving educators a firm grounding in and training with digital technology is the most transparent approach to enhancing their professional growth. It's crucial that teachers become proficient in the latest technological advancements so that they can be used effectively in the classroom. The ability to conduct research, analyse data critically, integrate data from several sources, and reframe retrieved content are all skills that teachers should be proficient in using digital media technology to accomplish. Pongsakdi et al. (2021) found that after the training, teachers in the high confidence group required less assistance with ICT, while those in the low confidence group saw no change. Schools that had to close due to the COVID-19 pandemic found that ICT resources, especially digital teacher competency and opportunities for teacher education to improve digital competence, were essential for adjusting to online teaching. A 2019 study by Merillo and Domingo found that educators felt that incorporating ICT into the classroom can benefit students' educational experiences. Most of the educators surveyed in this study were certain that their students would learn more if they used ICT since classes would be more interesting and fun. Researchers found that instructors' perceptions of ICT integration's effectiveness in language classrooms varied significantly according to both age and years of experience in the field. Using ICT in classrooms, participants agreed, according to Jatileni & Jatileni

(2018), will improve education. Another key finding is that male educators are much more likely to make use of ICT than their female counterparts. According to studies conducted by Eickelmann and Vennemann, teachers' positive attitudes and beliefs, especially PU and PEU, are recognised as crucial determinants and predictors of teachers' use of ICT in education (2017). It was found by Bas (2017) that there was no significant difference between men and women in their figurative understandings of ICT. Teachers' attitudes about ICT integration shifted significantly, particularly among those who had received training through a mixed learning approach, claim Qasem and Viswanathappa (2016). The education authorities in Yemen should take advantage of teachers' readiness to embrace ICT by incorporating it into existing programmes for in-service instructors. Charles and Issifu (2015) report that students valued their work highly and placed a high price tag on it. When compared to female students, male students value the integration of ICT into the classroom more highly. Another interesting fact is that students in public schools value the use of technology more highly than those in private institutions. The majority of kids surveyed expressed positive feelings toward ICT use. Ndibalema (2014) claims that while African educators viewed ICTs favourably, they did not properly incorporate them into their teaching practise. It was also found that a major issue was the teachers' inexperience in using ICTs in the classroom. It's important to keep in mind that educators' mindsets can significantly affect the quality of ICT implementation in the classroom (Kusano et al., 2013). Other studies have found a connection between teachers' use of technology in the classroom and their pedagogical philosophy (such as their philosophies of teaching and learning). In order to influence teachers' worldviews, educational institutions must develop strong leaders. Furthermore, school administrators should aid individual teachers and staff members in their roles as both formal supervisors and personal advisors (Kim, Kim, Lee, Spector, & DeMeester, 2013). Martinovic and Zhang (2012) investigated the perspectives, expectations, and perceptions of future educators on the availability and usability of ICTs in the classroom. The primary findings were that future educators, regardless of their level of skill, were not adequately prepared to use ICTs in their classrooms, had unrealistic expectations about what it would be like to learn and teach with ICTs, and had limited access to such tools in their institutions of higher education. In 2012, Rana interviewed Indian professors for his study. Researchers found that most teacher educators saw the potential benefits of information and communication technologies (ICTs) for education and the classroom positively. There were no significant variations in opinions regarding the use of ICTs in teacher training between the sexes, while there may be differences in opinions depending on age. According to research conducted by Alazam, Bakar, Hamzah, and Asmiran (2012), the majority of teachers who took part in the study used ICTs to a moderate degree and had moderate ICT skills. Teachers levels of expertise with digital tools varied widely by gender, age, and years of experience in the classroom. Analyzing Buabeng-Andoh may reveal similar complications (2012). Peeraer and Van Petegem (2011) found that while some Vietnamese educators were using ICT apps in the classroom, it was generally to replace more traditional methods of teaching. Presently, the use of ICT in the classroom is determined

by teachers' own ICT competence and their students' computer literacy. Teachers' ICT use and attitudes are positively correlated, according to research by Al-Zaidiyeen, Mei, and Fook (2010). Educators tended to use ICTs at a low level for instructional purposes. Voogt (2010) argues that professors who incorporate technology into their lectures tend to be very confident in their pedagogical technology abilities and to place a premium on a learner-centered approach. Teachers who use technology in the classroom are more likely to participate in professional development opportunities and collaborate with colleagues than their non-technologically savvy counterparts. You'll find a summary of key findings from relevant studies below. For instance, in 2009, Cavas, Cavas, Karaoglan, and Ksla conducted a study with Turkish scientific educators. The results showed that Turkish science educators generally held positive views of ICTs. While there was no significant difference in ICT attitudes between teachers of different sexes, there were differences by age, computer ownership at home, and years of experience using computers in the classroom. An optimistic view of computers is expected to boost its use in the classroom (VanBraak, Tondeur, & Valcke, 2004). It is important for consumers to have positive attitudes toward innovation, as stated by Woodrow (1992), for educational practise to successfully shift. As can be seen, all authors acknowledged a variety of challenges associated with incorporating ICTs into the classroom, yet nearly all authors recognise the vital function that ICTs serve in teaching and learning. The more comfortable and confident a teacher feels using a computer, the more likely they are to positively influence their students. There is a positive correlation between teachers' level of computer literacy and the degree to which they view computers favourably in the classroom (Rozell & Gardner, 1999).
Research based on the aforementioned studies has indicated the perspective of aspiring secondary school teachers regarding ICT integration in the teaching, learning, and evaluating processes. As evidenced by said research, the title of this piece of work is appropriate.

Statement of the Problem:

The present study is an attempt to investigate the “Perception of Prospective Teachers on ICT Integration in Teaching Learning and Assessment Process at Secondary Level”

Objectives of the Study:

The present study consisted with following objectives:

1. To compare the perception of male and female perspective teachers on ICT integrated teaching learning and assessment at the secondary level.
2. To know the willingness of prospective teachers on ICT integrated teaching learning and assessment at the secondary level.

Hypotheses of the Study:

Review of the related literature (Contradictory findings in research studies regarding the variables used in the present study) supported the investigator to construct hypotheses for the present study. In the pursuit of the above stated objectives the following research hypotheses were formulated.

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1. There will be no significant difference in male and female perspectives teachers' perception of ICT integrated teaching learning and assessment at the secondary level.
2. There will be no significant difference in the willingness and unwillingness of prospective teachers towards the use of ICT integrated teaching learning and assessment at the secondary level.

Methodology of Study:

The present study examined the perception of Prospective Teachers towards the use of ICT integrated teaching learning and assessment at the secondary level. For this reason, the researcher adopted a descriptive survey method.

For the present study, researchers took 90 samples (Prospective Teachers) of TEIs in Tripura through random sampling techniques.

The researcher used self-developed tools to know the perception of prospective teachers towards ICT integration in teaching learning and assessment at the secondary level in the present study. There were 32 items based on the Likert scale format, i.e. 1 for Strongly Disagree, 2 for Disagree, 3 for Undecided, 4 for Agree and 5 for Strongly Agree. The prospective teachers have to choose any one option out of these for each item.

Procedure of the Study:

The investigator had visited TEIs physically and collected data from the prospective teachers. The researcher had used a questionnaire for collection of data. The self developed questionnaire was standardized with the help of different teachers and teacher educators.

Measuring Tools:

In this study, the researcher had used a self developed questionnaire.

Data Analysis:

The Investigators used inferential statistics like a t-test (Independent) for analysis and interpretation of the data. In the present study, the level of significance was 0.05. The investigator used MS Excel and jamovi project 2021 to analyse the quantitative data in the study.

Table-4.1. Descriptive statistics of perception of prospective teachers towards ICT integration in teaching learning and assessment process at secondary level

Q. No.	Types of Particulars	Gender (1- Male and 2- Female)	N	Mean	Std. Error of Mean	Median	SD	Minimum	Maximum	Shapiro-Wilk	
										W	p
1	Perception of ICT integration in	1	35	3.69	0.1067	4	0.631	2	5	0.708	<.001
		2	55	4.02	0.0841	4	0.623	3	5	0.776	<.001
2		1	35	4.34	0.1293	5	0.765	3	5	0.753	< .001
		2	55	4.29	0.1027	4	0.762	3	5	0.769	< .001

3		1	35	3.14	0.1929	3	1.141	2	5	0.822	< .001
		2	55	3.00	0.1421	3	1.054	2	5	0.803	< .001
4		1	35	3.66	0.1531	3	0.906	2	5	0.840	< .001
		2	55	3.91	0.1278	4	0.948	2	5	0.812	< .001
5		1	35	3.94	0.1080	4	0.639	3	5	0.785	< .001
		2	55	3.84	0.0723	4	0.536	2	5	0.676	< .001
6		1	35	3.80	0.0987	4	0.584	3	5	0.748	< .001
		2	55	3.96	0.0898	4	0.666	1	5	0.692	< .001
7	**Use of Educational Technology**	1	35	3.97	0.1665	4	0.985	2	5	0.824	< .001
		2	55	4.20	0.1113	4	0.826	1	5	0.785	< .001
8		1	35	3.09	0.1186	3	0.702	2	5	0.816	< .001
		2	55	3.78	0.1091	4	0.809	2	5	0.831	< .001
9		1	35	4.00	0.0820	4	0.485	3	5	0.659	< .001
		2	55	3.93	0.1065	4	0.790	1	5	0.701	< .001
10		1	35	4.26	0.0750	4	0.443	4	5	0.546	< .001
		2	55	4.16	0.1062	4	0.788	2	5	0.778	< .001
11		1	35	4.29	0.1268	4	0.750	3	5	0.777	< .001
		2	55	4.29	0.1027	4	0.762	3	5	0.769	< .001
12		1	35	4.09	0.1186	4	0.702	3	5	0.805	< .001
		2	55	4.00	0.0971	4	0.720	3	5	0.809	< .001
13	**Technology based Assessment**	1	35	3.26	0.1803	4	1.067	1	4	0.706	< .001
		2	55	3.51	0.1241	4	0.920	1	5	0.784	< .001
14		1	35	3.37	0.1236	3	0.731	2	5	0.793	< .001
		2	55	3.78	0.1122	4	0.832	2	5	0.859	< .001
15		1	35	3.80	0.1283	4	0.759	3	5	0.795	< .001
		2	55	4.02	0.1146	4	0.850	2	5	0.829	< .001
16		1	35	4.20	0.0898	4	0.531	3	5	0.702	< .001
		2	55	3.80	0.1255	4	0.931	1	5	0.788	< .001
17		1	35	3.97	0.1389	4	0.822	3	5	0.797	< .001
		2	55	3.93	0.1394	4	1.034	1	5	0.853	< .001
18		1	35	3.89	0.1407	4	0.832	3	5	0.786	< .001
		2	55	3.87	0.1072	4	0.795	2	5	0.842	< .001
19	**Employ ICT integration in teaching, learning and assessment**	1	35	3.09	0.1499	3	0.887	1	5	0.854	< .001
		2	55	3.42	0.1341	3	0.994	2	5	0.870	< .001
20		1	35	3.97	0.0765	4	0.453	3	5	0.621	< .001
		2	55	3.71	0.0887	4	0.658	2	5	0.688	< .001
21		1	35	3.63	0.1091	4	0.646	3	5	0.759	< .001
		2	55	3.69	0.0931	4	0.690	3	5	0.776	< .001
22		1	35	2.94	0.1784	3	1.056	1	5	0.895	0.003
		2	55	2.42	0.1715	2	1.272	1	5	0.869	< .001
23		1	35	3.94	0.1155	4	0.684	2	5	0.571	< .001
		2	55	3.91	0.0746	4	0.554	1	5	0.505	< .001
24	**Differences between male and**	1	35	3.91	0.1255	4	0.742	3	5	0.809	< .001
		2	55	3.82	0.1447	4	1.073	2	5	0.847	< .001
25		1	35	3.03	0.1613	3	0.954	1	5	0.897	0.003
		2	55	2.96	0.1467	3	1.088	1	5	0.890	< .001

26		1	35	3.83	0.1328	4	0.785	2	5	0.844	< .001
		2	55	3.91	0.1014	4	0.752	2	5	0.809	< .001
27		1	35	3.54	0.1253	4	0.741	2	5	0.847	< .001
		2	55	3.35	0.0869	3	0.645	2	5	0.789	< .001
28		1	35	3.71	0.0877	4	0.519	2	4	0.582	< .001
		2	55	3.65	0.0788	4	0.584	2	5	0.709	< .001
29	**Using own device or Institutes device**	1	35	3.91	0.1320	4	0.781	2	5	0.825	< .001
		2	55	3.96	0.1100	4	0.816	2	5	0.839	< .001
30		1	35	3.69	0.1143	4	0.676	3	5	0.776	< .001
		2	55	3.75	0.1012	4	0.751	2	5	0.808	< .001
31		1	35	4.17	0.0868	4	0.514	3	5	0.685	< .001
		2	55	4.05	0.0951	4	0.705	2	5	0.815	< .001
32		1	35	3.51	0.1320	4	0.781	2	5	0.834	< .001
		2	55	3.65	0.1303	4	0.966	1	5	0.890	< .001

Table has been drawn from Jamovi 20 free open source.

Table-4.2: Means differences of male and female prospective teachers on perception towards ICT integration in teaching learning and assessment process

Q. No.	Name of test	Mean diff.	Std. error diff.	Statistics	df	p
1	**Student's t**	-0.33247	0.135	-2.4548	88	0.016
2		0.05195	0.165	0.3149	88	0.754
3		0.14286	0.235	0.6069	88	0.545
4		-0.25195	0.202	-1.2503	88	0.215
5		0.10649	0.125	0.8519	88	0.397
6		-0.16364	0.137	-1.1911	88	0.237
7		-0.22857	0.193	-1.1872	88	0.238
8		-0.69610	0.166	-4.1830	88	< .001
9		0.07273	0.149	0.4886	88	0.626
10		0.09351	0.146	0.6397	88	0.524
11		-0.00519	0.164	-0.0317	88	0.975
12		0.08571	0.154	0.5559	88	0.580
13		-0.25195	0.212	-1.1896	88	0.237
14		-0.41039	0.172	-2.3888	88	0.019
15		-0.21818	0.176	-1.2367	88	0.219
16		0.40000	0.173	2.3108	88	0.023
17		0.04416	0.207	0.2133	88	0.832
18		0.01299	0.175	0.0742	88	0.941
19		-0.33247	0.206	-1.6114	88	0.111
20		0.26234	0.127	2.0671	88	0.042
21		-0.06234	0.146	-0.4281	88	0.670
22		0.52468	0.258	2.0338	88	0.045
23		0.03377	0.131	0.2572	88	0.798

24		0.09610	0.207	0.4635	88	0.644
25		0.06494	0.225	0.2892	88	0.773
26		-0.08052	0.165	-0.4867	88	0.628
27		0.19740	0.148	1.3355	88	0.185
28		0.05974	0.121	0.4935	88	0.623
29		-0.04935	0.174	-0.2844	88	0.777
30		-0.05974	0.156	-0.3822	88	0.703
31		0.11688	0.138	0.8474	88	0.399
32		-0.14026	0.194	-0.7213	88	0.473

Table has been drawn from Jamovi 20 free open source.

Findings of the Study:

1. In many questions about how potential teachers perceive ICT integration in teaching, learning, and assessment, there is a statistically significant difference between male and female candidates at the 0.05 level. Therefore, the secondary level ICT integration in teaching, learning, and evaluation processes is viewed favorably by potential teachers.
2. At 0.05 levels, there is a considerable disparity between how male and female future teachers use educational technology to integrate it into teaching, learning, and evaluation. In light of this, it is clear that both male and female prospective teachers have a favorable opinion of the need to incorporate ICT into the teaching, learning, and evaluation processes.
3. At 0.05 levels, there is a substantial difference between male and female prospective teachers' technology-based assessment methods for ICT integration in the assessment process. Because of this, both male and female prospective instructors have a favorable opinion of the use of ICT in assessment to gauge students' learning.
4. In terms of the perception to employ ICT integration in teaching learning and assessment at 0.05 levels, there is no statistically significant difference between the means of male and female future teachers. As a result, the environment and culture of the institution affect both male and female willingness.
5. At 0.05 levels, there is no discernible difference in how the prospective teachers use ICT for assessment. The view of using ICT for evaluation is therefore the same for both male and female prospective teachers.
6. The use of one's own device or one provided by the institution to use ICT in teaching, learning, and assessment by aspiring teachers does not significantly differ from either. Therefore, it is irrelevant to the teaching, learning, and assessment processes whether male or female prospective teachers believe that using their own or the institution's equipment is appropriate. There is no such training or setting to include ICT into the process of teaching, learning, and assessment.

Educational Implications:

This study examined how potential teachers perceived the use of ICT in secondary-level teaching, learning, and assessment processes in TEIs in west Tripura. Students, teachers, teachers, educators, administrators, curriculum creators, textbook authors, educational planners, parents, minority education trustees, religious, educational societies, and NGOs engaged in the field of education can all benefit from the study's findings.

Research Institutions: In the current study, the researcher employed a self-developed questionnaire on potential teachers' perceptions of the use of ICT in teaching, learning, and assessment that could be used in TEIs, schools, HEIs, and other training institutions.

Educational Planners and Administrators: Educational planners and administrators can take the initiative to create standardized manuals for new teachers and instructors already in the classroom to integrate ICT in teaching, learning, and assessment at all levels of the educational system.

Pre-service and in-service teacher training programmes: The current Study discovered that ICT integration in instruction, learning, and evaluation has a positive perception and may be helpful to all trainees shortly.

Book Author and Editors: Authors and editors can update textbooks by including certain chosen or pertinent ICT in instruction, learning, and assessment. Authors and editors of textbooks can also use these.

Curriculum planner: They comprehend new concepts and build them successfully; effective teaching and learning strategies are needed. Because of this, curriculum designers can include ICT integration in the teaching, learning, and evaluation processes.

Teachers: The current study emphasized the importance of ICT integration in education, which is emphasized in NEP-2020. Therefore, by integrating ICT into the teaching, learning, and evaluation processes, all teachers can be motivated, trained, and orientated to present the material in a more approachable way.

Parents: Parents, ICT integration in instructional strategies encourage active student participation in teaching-learning. In particular tasks, it aids their development of creative and critical thinking. Parents can therefore encourage their children to create and use ICT Integration in teaching, learning, and evaluation. In the same way, it helps Students, NGOs, Religious and Minorities trusts/ Societies and other Investigators.

Conclusion:

The present investigation uncovers that the perception of prospective teachers towards ICT integration in teaching learning and assessment strategy has a significantly better effect on prospective teachers to utilize ICT integration in teaching learning and assessment process.' The study has also highlighted and influences that use of educational technology by prospective teachers' perception have significant effect in modern education. Consequently, it is recommended that teachers should

utilize ICT integration teaching learning and assessment processes in training centers and academic schools for better outcomes among the teachers as well as students. There is no significant difference between male and female teachers should develop technological pedagogical content knowledge in their subject so that ICT can be effectively integrated in teaching, learning and assessment. At last but not the least, the study explained that there is no significant impact of teacher's own device or institutional devices; it shows only their perception which helps to teaching learning and assessment process through integration of ICT. Finally, research can conclude that perception of ICT integration in teaching, learning and assessment is demand in modern teaching learning process from primary to higher education level. In this context prospective teachers and teachers may use ICT integration teaching, learning and assessment process for better out comes among the youth.

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PUBLIC DOMESTIC DEBT, PRIVATE INVESTMENT AND ECONOMIC GROWTH IN AFRICA: A DYNAMIC GMM PANEL ANALYSIS

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Abstracts

Political leaders in Sub-Saharan Africa (SSA) have relied on excessive borrowing from the financial system to finance their unsustainable fiscal deficits, a trend that has decreased loanable funds and stifled investment in private sector and economic progress. The study looked into the effects of government domestic debt, private investment and private consumption spending on growth in SSA. Between 1980 and 2018, data from the World Bank Development Index (WDI) was collected on a random sample of five (5) African countries from the five different regions. Dynamic Panel GMM estimation methods was used to estimate the results. The results show that, public debt and consumption expenditure have a significant inverse effect on growth, while private investment exerts a significant positive impact on growth. According to the findings, public debt has a significant negative effect on growth in SSA. As a result, the paper recommends for policy makersto implement policies that discourage public borrowing, increase internal revenue, and reduce wasteful spending.

Key Words: Public debt, Private investment, Economic growth, Sub-Sahara Africa, Consumption expenditure

1. Introduction

Financial resources to start-up and manage investments must be sufficient for companies or private individuals to invest. According to Adam, Sule, and Ayo (2016), governments across the world barely have enough resources to carry out their obligations, so borrowing becomes a viable option. As a result, countries borrow to expand their economies, sustain growth, and eventually raise the living standards of their citizens based on scarcity principles (Ngerebo-A, 2014). Though the government has many options for funding its expanding operations, such as printing money, holding foreign exchange reserves, borrowing abroad, or tapping into the domestic economy, the method chosen to finance the government deficit has an impact on resource allocation and, by extension, macroeconomic activities (Apere, 2014). As a result, governments often see domestic borrowing as a way to escape both inflation and external crises (Apere, 2014). As the government borrows money from within the country, it competes with private firms for the same funds in the local financial sector, restricting the amount of credit available to private investors (Asaleye, Oladipo&Obasaju, 2018).

The crowding-out hypothesis states that government borrowing discourages private investment. If the government borrows a larger portion of domestic resources to fund deficits, there would be very little left for private investment. Despite the benefits of domestic debt, it limits the amount of credit available for private companies, placing downward pressure on local interest rates. Even when interest rates are kept low, domestic debt contributes to credit rationing and the dilution of the private sector's share of the market. Government domestic borrowing would help to force the private sector to borrow further internationally if the economy is well integrated with foreign capital markets (Apere, 2014). According to Aswata, Nnyanzi, and Bbale (2012), since money supply is constant in principle, borrowing from the local market by the government can stifle private sector investment by diverting funds away from industrious activities. Low access to credit alongside rising interest rates retard the private investment, just as rising local debt will lead to higher interest rates, raising manufacturing costs and making tradable products more costly and non-competitive in international markets. As a result, excessive public debt poses a challenge to capital growth in both domestic and foreign investment (Emenike, 2015)

Governments borrow when revenue projections fall short of expected expenditures or to repay maturing loans (Ponzi schemes) (Babu, Kiprop, Kalio&Gisore, 2015). In line with theory, sustainable debt level for less developed countries can enhance growth by fast-tracking growth ininfrastructural level (Siew-Peng& Yan-Ling, 2015). Borrowing, according to Ari and Koc (2018), allows individuals to balance their income and expenditures (consumption) in the face of higher-than-expected volatility. It also allows businesses to balance their output and investment as profits fluctuate dramatically and at unpredictable times. It also allowsthe state to curtail fluctuations in revenue and uncertainty resulting from taxation, other sources of income, and expenses. Governments are cautioned, however, to avoid accumulating debt above a particular threshold, such as the Maastricht guidelines used by the European Communities in 1992, in order to keep their debt under control and provide a buffer zone in the event that exceptional events occur that drive their level of borrowing that endanger their long-term growth and stability (Easterly, 1990).

One of the major obstacles to SSA achieving macroeconomic stability and inclusive growth has been the government'sover dependence on financial system loans to fund unsustainable budget deficits. The influx of high-powered capital into the economy by the banks amounts to a loan, which has significant negative consequences for price and exchange rate stability. In the same vein, it excludes the private companies from the financial market, causing investment and production growth to stagnate (Okwu, Obiwuru, Obiakor&Oluwalaiye, 2016). As a result, the interest rate has risen and the amount of lendable funds available to private investors has decreased (Mbanasor&Obioma, 2017). It has also made the country one of the most indebted countries on the planet. Worse still, debt resources have not been adequately used because the funds were channeled into projects with insufficient or practical preparation, resulting in a failure to produce sufficient resources to service the debt lent. Since the government spends too much money on debt repayments, it has less money to spend on education,

health, and other social services, which has harmed socioeconomic growth (Babu, Kiprop, Kalio&Gisore, 2015).

The government has taken a number of steps to keep the domestic debt in check, including debt rescheduling, debt conversion, debt-equity, and debt forgiveness. Despite these efforts, domestic debt has continued to rise, although private investment has remained low. Because of the government's dependence on the banking system for loans, the private sector has been shut out of the credit market, stalling investment and production growth (Adofu&Abula, 2012). Several research on the nexus between public debt, private investment, and domestic debt abound in the available literature, both nationally and internationally. Their conclusions, however, are not consistent, which may be due to the type of debt considered, the type of expenditure investigated, sampling, methodology, data used, or the country or area under investigation. Meanwhile, there is a paucity of literature in Sub-Saharan Africa SSA that captures the decomposition of public debt into public domestic debt and examines its relationship with private local investment and development, despite the fact that the country's domestic debt profile has continued to increase and the private sector has continued to fold. To fill this gap, the study looks at how public domestic debt and private investment, which is classified as private domestic investment in this case, affect economic growth in SSA.

1.3 Research Questions

The study make a concerted effort to provide answers to:

i. What is the effect of government domestic debt on economic growth inSSA?
ii. What is the effect of private investment on economic growth in SSA?
iii. How does private consumption expenditure affect growth SSA?

The findings of the study would be extremely beneficial to a variety of individuals, including government policymakers, the general public, and academics. Government policymakers would be able to make informed decisions about the amount of domestic debt to take on to fund government budgets, thus guiding government borrowing policies and investors in making investment decisions, based on the results. The study is expected to serve as a model for other developing countries in terms of debt sustainability. The study is restricted to a descriptive and empirical examination of the relationship between domestic debt and private investment between 1981 and 2018. The report just looks at the government's domestic debt. The study period was chosen based on the availability of data..

2 Literature Review

2.1 Conceptual Review

According to Adofu and Abula (2010), debt does not have a generally agreed meaning, but it is primarily defined as what a party legally owes to another and has agreed to repay in the future. It is a liability that can be enforced by court action. Borrowing is the act that creates debt. It is a debt that a

person, a company, or a country must repay when it matures (Kumar & Woo, 2010). Debt is therefore a financial undertaking that should be respected as time passes according to the terms of the agreement. Debt, according to Asogwa (2008), is defined as a contractual responsibility of owing or accrued borrowing with a pledge to repay at a later date. Domestic or foreign public debt may be gross or net, marketable or non-marketable, short, medium, or long term, and interest bearing or non-interest bearing (Anyanwu, 1993). According to Chowdhury (2001), public debt can be classified as the amount of foreign and domestic debt. When a loan comes from a foreign market or an institution outside the country of origin to fund domestic investment, it is referred to as external debt (Anyanwu, 1993). In general, the public debt includes all of a government's obligations (including currency obligations). Currency, short-term debt, floating debt, and subsidized debt are examples of such commitments.

The expenditure of money for potential use is referred to as an investment. It is a real asset venture; real assets are physical assets such as factories, property, capital goods, infrastructure, inventories, and so on (Agu, 2015). It entails sacrificing current consumption in favor of future consumption. Investment necessitates the commitment of funds intended for immediate use (Mbanasor and Obioma, 2017). Investment, according to Ekpo (2016), is the accumulation of actual capital goods. It is a phase of gradual change in capital stock in which an economic agent (individuals, companies, or the government) invests resources to acquire capital assets in order to increase potential profits, production, and performance, and improve people's living standards. The public and private sectors are the two primary sectors in which investment activities are carried out. As a result, investment is divided into two types: public and private (Mbanasor and Obioma, 2017). Private investment is often thought of in terms of the creation of physical capital. It includes physical capital investments made by businesses and individuals to acquire actual capital goods over time, resulting in potential product flows (Soludo, 2003).

2.1 **Theoretical Literature**

The following are some of the hypotheses that have been proposed to connect debt and investment: In the traditional model, a rise in public debt is a burden on the economy, while an increase in public spending is an expansionary fiscal shock to a nation. If the country's revenue fails to cover the spending, increase in state expendituretranslates to a reduction in public debt, which in turn translate to a rise in demand for goods and services. This is because there will be more money in the economy seeking less goods and services. Given the short-term price stability, increased demand for goods and services will boost output and employment (Ntshakala, 2015). Modigliani's Theory, published in 1961, argued that although an increase in national debt benefits those who are alive at the time of the boom, the burden of the current national debt is passed on to the next generation through a reduction of private capital stock. A decrease in national debt levels, on the other hand, is a burden to the current generation and a benefit to the next. The cost or benefit to future generations is determined by

the rate of interest at which the government borrows money, which can be used as a proxy for changes in private capital productivity. If the rise in debt contributes to an increase in government spending that raises future generations' real income through channels such as efficient public investments, the burden may be partially, fully, or more than fully offset (Modigliani, 1961).

In the investment process, investment models distinguish two distinct components: the measurement Establishing an ideal capital stock and the creation of an adjustment procedure to bridge the gap between the ideal and actual capital stocks (Spyros, 1983). One such idea, known as the "accelerator hypothesis," dates back to Clark (1917), who showed how the increase in capital demand is a consequence of the accelerating demand for final goods. Because it focused on quantity rather than price, Clark's model was known as the "rigid" or "basic" accelerator model of investment. This is because it was seen as having "Keynesian" principles (Akkina and Celebi, 2002). The flexible accelerator model was created later as a result of reformulating the rigid model to take into account the impact of volatility, earnings, financial factors, and other variables on investment. The rigid accelerator model only considers investment as a function of demand growth and assumes that the required stock of capital is reached in each time span. A rival model to the accelerator model is Jorgenson's (1967) investment strategy, sometimes referred to as the Neoclassical Model of Investment. Jorgenson posits that firms maximize advantage under a Cobb-Douglas production technique. Investment is seen as a distributed lag function of the desired capital's movement, with the desired capital being determined by the output volume, price, and consumer cost of capital. The production of the company and the user cost of capital, therefore, dictate spending. The neoclassical model, however, is restricted by a number of assumptions, such as rational expectations (although lags have been added in some model variations to capture adaptive prospects), unit elasticity of capital and labor substitution, exogenously determined output prices, reversible investment, and malleable capital stock (factor input ratios of equipment), among others (Aswata, Nnyanzi and Bbale, 2012).

Empirical Literature

In this subsection, studies that relate one type of debt to a specific type of investment or other macroeconomic variables are examined. There are several studies on the link between debt and investment as well as other macroeconomic factors in emerging nations. To test the idea that political strife discourages private investment, Azzimonti (2017) developed a high-frequency indicator of partisan conflict index using a semantic search approach to assess the frequency of newspaper stories describing parliamentarians' policy disagreements. According to the data, PCI and total spending are inversely related in the US. For four of the world's fastest-growing countries (the US, China, Japan, and Germany), Ari and Koc (2018) examine the causal link between public expenditure and sovereign debt in terms of the sustainability of public debt from 2000 to 2015. Based on mathematical data and empirical results, the thesis that sovereign debt is harmful to the financing of public infrastructure if it surpasses specific thresholds, as suggested in this research and according to the literature, was found to be supported.Afonso and Aubyn (2016) utilize a VAR survey with yearly data from 1960 to 2014

to examine the macroeconomic effects of public and private expenditure in 17 OECD nations. According to impulse response functions, public investment has a direct growth influence in the majority of countries but a contractionary impact in Finland, the United Kingdom, Sweden, Japan, and Canada. While the majority of the nations saw crowding-in effects, private investment was driven out of Belgium, Ireland, Finland, Canada, Sweden, and the United Kingdom as a consequence of state expenditure. Private investment has a positive relationship with impact in every country, however state investment pushes out (crowds in) private investment in Belgium and Sweden (in the rest of the countries). returns on public and private investments that are only partially favorable. Similar to this, Sineviciene and Railiene (2015) used a systematic, logical, and comparative review of scientific literature, descriptive statistics, hierarchical cluster analysis, and correlation analysis with cross-sectional data from EU countries between 2003 and 2012 to examine the relationship between government size, tax burden, and private investment. The research comes to the conclusion that there are other factors preventing private investment in addition to government size and tax load.

There are many studies on established and developing market economies, many of which link debt to investment or other macroeconomic factors. In their study, Abdullahi, Bakar, and Hassan (2016) examined the link between foreign debt and capital creation in Sub-Saharan African (SSA) nations. One of the most crucial macroeconomic factors for long-term development, capital accumulation, was shown to be negatively impacted by foreign debt. Immurana, Boachie, and Sakyi are on the same boat. (2016) examine the immediate and long-term impacts of financial development on private investment in Ghana from 1970 to 2014. The results, which are concentrated on ARDL bounds testing to cointegration, show that in the short run, the influence of financial development on private investment depends on how financial development is measured, whereas in the long run, financial development has not been a major driver of private investment. The impacts of domestic debt on growth in Pakistan from 1972 to 2009 are examined by Sheikh, Faridi, and Tariq (2010) using the Least Squares approach. The results show that domestic debt benefits Pakistan's economic growth. Therefore, the inverse effect of paying domestic debt on growth is bigger than the direct effect of domestic debt on growth. Sakyi, Boachie, and Immurana (2016) simultaneously examined the short- and long-term impacts of financial development on private investment in Ghana between 1970 and 2014. The results, which are based on the ARDL bounds testing approach to cointegration, show that in the short run, the impact of financial development on private investment depends on how financial development is measured, while in the long run, financial development has not been a significant driver of private investment. From a comparable vantage point, Ntshakala (2015) investigates the impact of public domestic and international debt on Swaziland's growth. The time series data from 1988 to 2013 were examined using the Ordinary Least Square (OLS) technique. For the time period under consideration, it was shown that there is no significant association between Swaziland's foreign debt and economic development, however internal debt exhibits a substantial positive relationship with economic growth at a significant stage of 5%. Research on the connection between debt and

investment is widely available in Nigeria. For instance, Apere (2014) examined the impact of governmental debt on private investment in Nigeria between 1981 and 2012. In Nigeria, domestic debt has a linear, favorable influence on private investment, but international debt has a U-shaped effect.

Onogbosele and Ben (2016) looked at the effect of Nigerian domestic debt on economic growth from 1985 to 2014. The variance decomposition study showed that the growth rate of Nigeria's gross domestic product is more affected by federal government bonds, according to the results of the multivariate Vector Autoregression model. Then came treasury bond shocks, which had the least effect on GDP shocks, followed by growth stocks and interest rates. Economic growth reacted positively to shocks in Nigerian federal government bonds and negatively to shocks in treasury bonds over a ten-year period, according to the findings of the impulse response feature in support of the variance decomposition study. Meanwhile, the GDP reacted erratically to changes in construction stocks and interest rates. Idenyi, Feyinwa, and Gabriel (2016) investigated the impact of increasing public debt on unemployment in Nigeria between 1980 and 2015 using the auto regressive distributed lag model. The findings of the analysis reveal a long-term relationship between the dependent and independent variables. As a result, the study concludes that Nigeria's public borrowing has not had the desired economic effect, and thus the rise in public debt has not resulted in a decrease in unemployment. In a related report, Chete and Akpokodje (1997) look at the factors that affect private investment in Nigeria. The results suggest that a combination of internal disequilibrium and external shocks is to blame for the sluggish speed of private investment recovery.

For instance, Onyeiwu (2012) studies the connection between domestic debt in Nigeria and economic growth. Quarterly data from 1994 to 2008 were assessed using the Ordinary Least Squares Method (OLS), Error Correction, and parsimonious models. The finding that domestic government debt holdings are substantially beyond the healthy threshold of 35 percent of bank deposits, average 114.98 percent throughout the research period, suggests that private investments are being squeezed out. Naturally, the analysis comes to the conclusion that high debt levels are bad for economic growth.

Akpansung and Gidigbi (2020) examined the causal connection between the two variables as well as the structural flaws in the variables. The investigation covered the years 1981 to 2018 and employed annual time-series data from Nigeria. The techniques for Johansen-Juseliuscointegration, vector error correction modeling, Granger causality, Augmented Dickey-Fuller, and Bai-multiple Perron's structural breaks were used to evaluate the data. The findings confirmed that there are both steady short- and long-term correlations between government debt and economic growth. According to the analysis, there was no direct relationship between Nigeria's public domestic debt-to-GDP ratio and the country's real GDP growth rate. There was also no lag time effect of domestic debt-to-GDP ratio on GDP growth rate. Five structural breaks in the variables were discovered using the Bai-Perron test. All of these breakdowns happened throughout the sample period and corresponded with visible political and economic events in the area. Additionally, Ayuba and Khan (2019) look at the long-term

link between Nigerian domestic debt and fiscal policy for economic development from 1981 to 2013. The research uses Narayan's autoregressive distributed lag (ARDL) method and looks at boundaries in order to examine endogenous growth theory (2005). The results show that although negative domestic debt is detrimental to the economy as a whole, it is beneficial to total aggregate government income and economic development in Nigeria throughout the research period. Similarly, Abdulkarim and Saidatulakmal (2020) used yearly time series data from 1980 to 2018 to investigate the impact of public debt on Nigeria's economic development. A quantitative and ex-post facto research approach was employed to gather, evaluate, and interpret secondary data pertinent to the study's goal. The short- and long-term relationships between measures of economic growth and public debt were examined using the Autoregressive Distributed Lag technique. The empirical results showed that the foreign loan stock had a short-run growth-enhancing effect while being a long-term development barrier. Although domestic debt buildup had a short-term negative impact on production growth, it had a long-term favorable benefit. Long- and short-term growth were both slower due to debt service payments than they were due to a rise in foreign reserve holdings. The diagnostic tests found no non-normality, serial correlation, heteroscedasticity, or errors in the projected model specification.

3. Methodology

3.1 Theoretical Framework

The theoretical framework used in this research is based on the workofOkwu, Obiwuru, Obiakor and Oluwalaiye (2016) based on adapted "debt-growth viability model"proposed by Solis and Zedillo (1985). The framework linked growth as proxy by output level Y and debt measure by capital *K*, to analysis the effect of debt on indebted nations

$$Y = \sigma K \quad (1)$$

where σ is the efficiency parameter of capital, *K*. Change in *Y* is attributed to change in *K*. Thus,

$$\Delta Y = \sigma(\Delta K) \quad (2)$$

Considering change in capital, *K*, "as the positive difference between current investment, *It*, and the level of immediate preceding capital stock, *Kt-1" (*Obiakor and Oluwalaiye, 2016), the right-hand side of the model two changes to:

$$\Delta K = It - \delta Kt\text{-}1 \quad (3)$$

where δ is continuous movement in immediate past capital stock, *Kt-1*. As a result, present production, *Yt*, can be written as the addition of present investment, *It*, and immediate previous production volume, *Yt-1*. Thus,

$$Yt = \sigma It + (1\text{-}\delta)Yt\text{-}1 \quad (4)$$

Given the following national output and income identities

$$Yt = Ct + It + (Xt - Mt) \quad (1.1)$$

$$Yt = Ct + St + rtDt\text{-}1 \quad (1.2)$$

where *Ct* is present consumption spending, *(Xt – Mt)* is net export, *St* is present savings, *Dt-1* is the immediate past debt volume with its growth rate, and *r* is debt service rate during time period, *t*. Depicting the sum of net export and demand for investible funds as *dt* yields:

$$dt = (Xt - Mt) + rDt\text{-}1 \quad (6)$$

Therefore,

$$It = St + dt \quad (7)$$

Given the savings function as

$$St = s(Yt - rtDt\text{-}1) \quad (8)$$

Using equation (4), investment can be written

$$I_t = \left[\frac{s(1-\delta)}{1-s\sigma}\right] Y_t\text{-}1 \left(\frac{s}{1-s\sigma}\right) r_t D_t\text{-}1 + \left(\frac{1}{1-s\sigma}a\right) d_t \quad (9)$$

Equations fourand ninewere solved for a number of possible paths of *Dt*and *rt*. The rule used for *Dt*is the dynamic equation.

3.2 Research Design and Model Specification

Since the outcome of the explanatory variable is already defined, an ex post facto research design was used to investigate the impact of public domestic debt and private investment on economic growth in Sub-Sahara Africa. The model used in the study was adapted from Emmanuel's (2012) study on the impact of public debt on growth in Nigeria, in which the growth rate was the explanatory variable and the explanatory variables were domestic debt, foreign debt, total debt, foreign debt service, and domestic debt service in line with the total factor productivity theoretical framework. Their model was tweaked to include economic growth as the dependent variable, with public debt, consumer spending, and private investment proxy by capital formulation as explanatory variables. It is estimated that the following equation will be true:

$$GDP_{i,t} = \alpha_0 + \alpha_1 PBDT_{i,t} + \alpha_2 CONX_{i,t} + \alpha_3 PRIV_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where economic growth is the dependent variable, and the main explanatory variables are the shares of public debt, as well as control variables such as consumption expenditure and private investment proxy by capital formulation, which may have an effect on growth. The a priori expectation is that public debt will have a negative impact on economic growth in Africa, whereas consumption expenditure and private investment are expected to have a positive impact.

3.3 Estimation and Data Sources

A random sample of five (5) African countries was used in the study. One country was selected at random from each of Africa's five regions: East, Central, West, Southern, and North Africa. Côte d'Ivoire, Ghana, Mauritania, Nigeria, and So Tomé and Principe make up this group. The data used in the analysis came from the World Bank Development Index (WDI) 2018, and the sample included in the study spanned the years 1980 to 2017.

We used dynamic panel data estimate techniques, which have the benefit of enabling the utilization of both time series and cross sectional data dimensions (Bogdan and Alina, 2015). The variables' stationarity is confirmed by Im, Pesaran, and Shin's IPS test (2003). Both fixed and random factors are taken into account while estimating the equations in order to control particular country-specific features. The robustness of the findings is examined, and fixed and random effects are distinguished using the Hausman test. The key distinction between fixed effects and random effects models is how they presume to represent heterogeneity and the most appropriate estimate technique for each (Bogdan and Alina, 2015). For fixed effects models, OLS is necessary, but GLS is necessary for random effects models. The Hausman statistic has a high level of significance, which rules out the null hypothesis. The random effects model may also be assessed separately using the Breusch Pagan Lagrange multiplier test with the null hypothesis that the variances across entities are zero (Bogdan and Alina, 2015). Then, using Arrelano and Bond's first differenced Generalized Method of Moments

(GMM), the potential time invariant nation fixed effects supported by the Hausman test are retrieved (1991).

4. Data Analysis and Results

4.1 Unit root test

The study used Im, Pesaran and Shin W-stat to test for the presence of stationary in the panel data.

Table: Unit rootresults.

Variables	Im, Pesaran and Shin W-stat		Order of Integration
	Level	First Diff	
GDP	-13.5	-	I(0)
PBDT	8.82	-12.06	I(1)
CONX	-7.992	-	I(0)
PRIV	6.168	-16.776	I(1)

Source: Author, 2019

Note: I(0) series are included in the analysis without been differenced while I(1) series are differenced assuming asymptotic normality for the probability value

Table 1 show that gross domestic product and consumption expenditure are stationary at level I(0) based on 5% critical value while public debt and private investment are stationary only at first difference

4.2 Empirical Result

4.2.1 Random and Fixed Effect Estimates

Table 2illustrate the outcome of estimating random and fixed effects equation (1)of the static panel. The estimation is conducted to determine theeffect of public debt and private investment on economic growth in SSA through fixed and random effects estimators.

Table 2: Random and Fixed Effect Estimates

Variables	**Coeff**	Standard error	P>/z)	Adj.R	Prob>F
Randomn effect model				0.461	0.000
Constant	-0.283	0.012	0.0012		
PBDT	0.279	0.011	0.0000		
CONX	0.458	0.118	0.0100		
PRIV	0.0421	0.238	0.0000		
Fixed effect model					
Constant	0.231	0.028	0.1102		
PBDT	-0.450	0.117	0.0100		
CONX	-0.939	0.237	0.0150		
PRIV	0.954	0.238	0.0000		
Hausman test	9.69				
Prob>chi2	**0.0079**				

Source: Author, 2019

Table2 present the result of the random and fixed effect model in a static panel analysis and the robustness results based on the Hausman test. The computed Hausman test statistics favour the fixed effects model estimator. Therefore there is no need to interpret the random effects. In this case, public

debt (β=-0.450, P<0.05)and consumption expenditure (β = -0.939, P<0.05) show a significant inverse relationship with economic growth while private investment(β =0.954, P<0.05) exerts a significant direct impact on economic growth in Africa at 5 percent level.

4.2.2 Dynamic Panel Data Estimates

Table 3 reports the results of the dynamic estimation with one period lag.

Table 3: Dynamic Panel Data Estimates

Variables	**Coefficient**	Standard error	P>/z)
GDP-1	0.084	0.0000	0.0373
PBDT	-0.075	0.0261	0.0002
CONX	-0.089	0.0101	0.0136
PRIV	0.142	0.0000	0.0001
Wald test	125.12		
Prob>chi2	0.0000		

Source: Author, 2019

Notes: The level of significant is at 5 percent level.

Table 3 shows that public debt (β =-0.075, P0.05) and consumer spending ((β = -0.089, P0.05) have a significant inverse relationship with economic growth in at the 5% stage, while private investment (β =0.142, P0.05) has a significant positive effect. The lag value of economic growth in Africa also reveals a strong direct relationship.

5. Conclusion and Recommendations

This study used Dynamic panel analysis to determine the relationship between public domestic debt, private investment, and economic growth in Sub-Saharan Africa, which has not been well established in the literature. Given the fact that most of the studies on Africa region have been country specific, with findings that cannot be generalised for the entire region, a generalised method of moment estimation technique could help to shed light on the implications of public domestic debt in the region and provide the required reason for the disagreement in prior works.

According to the findings, public debt has a significant negative impact on economic growth in Africa. As a result, the majority of economies will be unable to continue borrowing. This may be due to Africa countries' long-term budget deficits. However, if the public debt in the region continues to rise unabated, the long-term consequences of public debt on these countries will be disastrous. As a result, policymakers should pursue policies that discourage public borrowing, increase internal revenue, and reduce wasteful spending, according to the findings.

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ORIGIN OF THE CONCEPT OF SURROGACY IN INDIA: AN OVERVIEW ON HISTORICAL AND LEGAL PERSPECTIVE

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Abstract

The human physique is a mysterious contraption consideration of which is still a riddle. The impending childbearing through the process of test tube babies, and surrogate motherhood through new reproductive and cloning technology will introduce some undreamt possibilities in the sexual arena. It is the inherent right of every woman to enjoy, conceive and cherish the feeling of motherhood. The infertility of a couple deprives them of the opportunity of experiencing this pleasure. Surrogacy is a wonderful and exciting reproduction system where the woman consents to become pregnant for the purpose of gestating and giving birth to a child for others to raise. In some jurisdictions, the possibility of surrogacy has been allowed and the intended parents may be recognized as the legal parents from birth. Commercial surrogacy, or "Womb for rent", is a growing business in India. In our rapidly globalizing world, the growth of reproductive tourism is a fairly recent phenomenon.The surrogacy contracts cross the threshold into in India mainly involve women from the lower strata who are uneducated, unlike the commissioning parents who are educated and have a better understanding of the contractual commitment. The surrogacy business is exploiting poor women in countries like India already have an alarmingly high maternal death rate. Without a foolproof legal framework, patients will invariably be misled and the surrogates exploited. This article aims to focus on all those issues and also on the recognition of surrogate mothers as autonomous person who is given the exclusive right to determine their legal status.

Keywords: Commercial Surrogacy, Paternity issues, Legal status, Women′s right to health.

Introduction

If mythology is to be believed, this seemingly new technique of surrogate motherhood may not be so new after all. It explains the one hundred children of Dhritarastra and Gandhari in Mahabharata.[1]

It is the birthright of every woman to conceive and cherish the feelings of motherhood. Surrogacy is a practice where one female bears a child for another couple with the intention to hand over the child

[1] Law and Medicine, “Surrogacy” Dr. Lily Srivastava Page no. 126

after its birth. The use of artificial insemination and the recent development of in vitro fertilization have eliminated the necessity for sexual intercourse in order to establish a pregnancy. Surrogate motherhood or surrogate birth involves artificial insemination with the help of another woman who bears a child that has been formed from the gametes of another woman and man. The couple might choose to use a surrogate for a variety of reasons, the most common one being the infertility of the woman.

The word 'surrogate' originated from the Latin word 'surrogatus' which means substitute, a person serving the place of another. Surrogacy is a "form of third-party reproduction in which a woman agrees to create and/or maintain a pregnancy for another person or couple, typically for monetary compensation".[2] Now, a woman can bear a child for a couple and even for a single person. The initiating couple or the person is known as the commissioning couple or person. The agreed women may be medically inseminated with the sperm of the commissioning man or donor. She may be under different situations, implanted with the embryo produce in-vitro.

Types of Surrogacy

There are two types of Surrogacy. They are:

1. Traditional Surrogacy
2. Gestational Surrogacy.

1. **Traditional Surrogacy**: The traditional Surrogacy is known as 'complete surrogacy', partial surrogacy as well as straight surrogacy. In this process of surrogacy, the eggs of the surrogate mother and the sperm of the commissioning husband are used in the conception of the child. It makes the surrogate mother genetic and biological mother of the child. This can happen at a fertility clinic through a process which is called as Intrauterine Insemination (IUI). During this process the washed sperm cells are implanted in the uterus directly by a catheter. The main point here is that the surrogate mother is having some emotional and natural connection with the child she carries—which is entitled with some ethical and legal complications. For example, a surrogate may change their mind about giving the baby to the intended parent or parents and could call into question a surrogacy contract. Depending on where you live, that contract may or may not be considered legitimate. The risk is even greater if a sperm donor is used, as the child is not genetically related to the intended father or mother but is related to the surrogate.

While a traditional surrogacy arrangement may seem preferable since it can be less expensive compared to gestational surrogacy, it's uncommon due to these concerns. In fact, some surrogacy

[2] Medical Law and Ethics in India, "Legal and Policy Challenges to Surrogacy in India", Dr. Sairam Bhat & Srividya R. Sastry

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programs no longer support traditional surrogacy arrangements, according to the American College of Obstetricians and Gynecologists (ACOG).

2. **Gestational Surrogacy:** Gestational surrogacy, on the other hand, is the more common option for those looking to start a family via surrogacy these days. It's also known as IVF surrogacy, host surrogacy, or full surrogacy. In this type of arrangement, the gestational carrier does not have a genetic tie to the child they carry. In this type of surrogacy, an embryo created in vitro is transferred into the uterus of a woman who does not contribute to the egg.

These two types of surrogacy are considered to be commercialized when the surrogate mother is paid in monetary terms not only for the period of her pregnancy but also for providing her services as a surrogate. But when the surrogate mother does receive any amount as compensation or any child support for her services and it is termed as altruistic surrogacy.

Surrogacy: An International Practice

Laws involving to surrogacy differ from country to country. In many countries like Sweden, Spain, France, and Germany surrogacy arrangements have been made unequivocally illegal, since it is contrary to their public policy, and in a few other countries, only altruistic surrogacy has been made legal. [3]

The perception of surrogacy has come into the fame, since the case of Elizabeth Kane in 1980. These technologies emphasis on gratifying the desire and dream of individuals to have their own biological child with the help of another individual by using scientific spreads. This scientific practice encompasses enduring concerns of human society to have offspring to linger their legacy, name, family, and property. The origin and expansion of surrogacy can be traced to ancient cultures, religions, and advances all over the world which have molded the insolence of the generations in the direction of surrogacy and its human rights implications.[4]

The use of surrogacy is a technique for procuring a biological child deliberately with full acceptance. Commonly, surrogacy performs were carried out in secret. However, the Baby M Case, due to its peculiar nature fetched surrogacy into the acquaintance of the public. In this case, Mary Beth Whitehead gave birth to Melissa Stern as a traditional surrogate mother in 1986. However, after the birth of the child, Mary Beth transformed her mind and instead of handing over the child to the intended parents, she took the decision to keep the baby herself. As a result, there was a two-year

[3] Infra footnote 2
[4] SURROGACY: LEGAL, ETHICAL, AND MORAL ISSUES, Anish V. Pillai

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legal battle between Melissa's biological father, Bill Stern, and her intended mother, Betsy Stern, over custody. Finally, the Sterns were fruitful in getting guardianship of the child and Mary Beth was given a right to visit casually. This extremely revealed case highpoints the various incompatible legal and human rights problems tangled in surrogacy and there is a requirement for a specific legal framework for its directive and control.

Along with supplementary progresses in the field of surrogacy, there has been an extraordinary intensification in occurrences of the application of surrogacy for obtaining a biological child. One of such occurrence is that, in case of Teresa Anderson, who is aged about 54-year-old gave birth to five boys as a gestational surrogate mother in 2005 on behalf of a couple she had introduced through online platform. Moreover, Ann Stopler, aged about 58 years gave birth to her twin granddaughters in August 2007. It was because of her own daughter, Caryn Chomsky, was unable to conceive due to cervical cancer. Another example is that of 56-year-old Jaci Dalenberg who became the oldest woman ever to give birth to triplets in 2008. She acted as a gestational surrogate mother for her daughter Kim and delivered her own grandchildren. One of the landmark events in the history of surrogacy is that of a surrogate woman who gave birth to her own grandchild at the age of 61 years. This event took place in Japan in 2008.

Surrogacy in India

Though the concept of surrogacy is measured as a new aspect of reproductive technologies in India, however, it is a long-standing concept that has its indication in the scripts of primeval Hindu Mythology. At that time the exercise of surrogacy was ended by sustaining secrecy. The illustration of surrogacy can be seen in the Bhagavat Purana. In accumulation to artificial fertilization, there occurred in ancient India a practice known as Niyog Pratha. This practice was trailed by young widows who did not have children when their husbands were alive but sought motherhood, infertile women, and women whose husbands were impotent. The preferred male for the act, in today's times, may be called a surrogate father. An esteemed person, who may or may not be associated to the woman, was preferred for surrogate fatherhood. More often, it was the brother-in-law of the woman, who became the surrogate father. There were clauses associated with the Niyog process. The preferred man would have no prerogative right over the child, and the performance would be only for duly bearing a child and not for desire, that he would be permitted a maximum of three times, that while accomplishment the act both associates should not be obsessed by desire or passion, and that the man and the woman would neither see respectively other's face nor comprise in arousal during the Ambalika begets Pandu through Niyog Pratha is pronounced in Manu smriti and the Mahabharata. In the Mahabharata, the widow of Vichitravirya Ambika creates Dhritarastra and Ambalika begets Pandu through Niyog Pratha. The admired man, a Rishi, preferred for the act was their brother-in-law Ved-Vyas. One of the queen's maids begets Vidura over the same process by Rishi Ved Vyas.

Niyog Pratha was also practiced before the Mahabharata times. This finds indication in the epic itself. Candrabali Tripathi and Chandra Mauli Mani wrote in their book "The Evolution of Ideals of Womanhood in Indian Society" "…. The Mahabharata does quote examples that prove the existence of Niyog prior to Mahabharata times….when Queen of Saudasa, with Vasishta to produce son Ashmaka."[5]

Hindu mythology also provides the existence of surrogacy in various periods. In Bhagavata Purana, Lord Vishnu heard Vasudev's prayers begging Kansa not to kill all sons being born. Vishnu heard that prayer of a father and had an embryo from Daivaki's womb transferred to the womb of Rohini, the other wife of Vasudev. Rohini then give birth to the baby Balaram, brother of Krishna, and secretly raised the child while Vasudev and Devki told Kansa that the child was born dead.

Consequently, the History of surrogacy also belonged to the Mahabharata, as in Mahabharata Gandhari delivered a semi-solid material at the place of delivering a child, Maharishi Vyas further divided that semi-solid material into 100 pieces and planted them in different pans. Thus 100 Kauravas were born.

Commercialization of Surrogacy in India

With an upsurge in the global marketplace for surrogacy, the surrogacy commerce in India has grown immensely. India's commercial surrogacy industry of India has grown enormously. India's commercial surrogacy industry accounts for about $2.5 billion. It is prophesied that the marketplace for surrogacy will be intense in India, which provides admittance to modern-day technology, and skilled doctors at very low rates compared to established nations that have legitimate surrogacy like the USA.

As the market for commercial surrogacy is growing, both doctors and surrogate mothers are engaging in exploiting activity. Newspapers have accounted for a few examples where the families have actually invigorated the surrogate mothers to take up surrogacy because that would help them to build a better life for themselves and their families.[6]

The commerce of a child is a thing that can be hard to imagine as the child is the symbol of love not of money and having a child is a perception away from the concept of marketing activities. But surrogacy has become a part of the commercial business in a country like India. This commercialization of surrogacy has now gone to become a political debate in Indian society. The market of surrogacy is now fetching very large and growing very rapidly. There are numbers of budding parents in a country like India who wishes to hire other women to bear their children.

[5]https://www.myindiamyglory.com
[6]Wanna Rent a Womb, Come to Anand, Times of India, 11th February 2006

The notion of surrogacy has orbited around unusual biotic function of the body of a woman into a commercial contract and henceforth the surrogate services are now even revealed. Surrogates are being conscripted and the functioning agencies make huge profits from them. The commercialization of surrogacy is nothing but giving rise to the new problem of selling children and setting up breeding farms which may turn women into baby producers.[7]

Commercial surrogacy, or "wombs for rent," is an increasing business in India. Critics have designated the admiration of surrogacy measures in India as a 'baby booming business', 'womb on hire', 'baby firm', and 'parenthood by proxy'. Surrogacy has turned a normal organic purpose of a woman body into a commercial contract. Surrogate services are publicized, surrogates are employed and operating agencies make large profits. The commercialization of surrogacy elevates fears of a black market and baby-selling, breeding farms, spinning impoverished women into baby producers, and the possibility of selective breeding at a price. In India surrogacy is fetching a booming industry due to the fact that surrogate mothers are easily available and the entire cost of this method which is very fewer compared to some other countries. High demand for surrogates has been observed in India because of the proportional ease with which foreigners can find surrogate mothers. Non-intervention of law had made surrogacy a knotty issue in India. At present surrogate motherhood in India involves a business of $445 billion, and faces severe pressures from different social concerns. India is the only country in the world that has legalized commercial surrogacy.[8]Legitimate in India in 2002, it is now a half-a billion-dollar-a-year industry, with surrogacy services offered in at least 350 clinics.

Legal Framework Regarding Surrogacy in India

Since many nation state ban surrogacy preparations or have tough laws or the charge of the same is high, many people prefer India as their destination for surrogacy. This makes it necessary to examine the legal framework of surrogacy in India.

In the year 2002 commercial surrogacy was legitimatize by India seeing this immense growth of surrogacy in India leads to the growth of many commercial surrogacy firms that claim to have the specialty in the surrogacy law and assist foreigners who came to India in search of a mother womb as a rent. Such rationalizing is painstaking to be very combustible in nature as it leads to the commercialization of baby selling and also harms the dignity and the reputation of the vouchsafed phenomenon of women's reproductive capabilities.

The 228th report of the Law Commission of India has indorsed prohibiting the process of commercial surrogacy and endorsed suitable legislation which allows performing altruistic surgery

[7]Surrogacy under the framework of the Indian Constitution, written by Divyansh Singh Sisodiya
[8] Commercialization of Surrogacy in India: A critical analysis, S.S. Das

which is ethical. There were certain strategies issued by the Indian council of medical research for regulating surrogacy arrangements they are:[9]

- Every surrogate mother will get the permission of monetary compensations, that the value of which would be definite by the couple and the surrogate mother.
- Another important point is that the surrogate mother cannot leave her own egg for the surrogacy and she must relinquish all parental rights related to the surrogate child.

The Indian Council for Medical Research (ICMR) along with the National Academy of Medical Sciences in the year 2005 for first time came out with Guidelines for the Certification, Management, and Parameter of Assisted Reproductive Technology Clinics in India. A transitory reading of the strategies affords that this was an attempt to ensure that the ART clinics are accredited, regulated, and supervised in India, and to promise their patients that they would provide world-class services.

Regarding surrogacy the following guidelines have been provided:[10]

i. Children born out of surrogacy must be espoused by the genetic parents except they cannot demonstrate that they are the genetic parents.
ii. Surrogacy should be assumed only where the patients are incompetent of apprehending for complete terms either physically or medically.
iii. The Guidelines forbid the ART centers to comprise in any monetary feature and advertising for surrogacy. Imbursement made to the surrogate mother should concealment genuine expenditures relating to pregnancy and documentary indication of financial prearrangement should be made accessible.
iv. The choice of finding a surrogate mother respites with the couple or a semen bank.
v. The surrogate according to strategies should be less than 45 years of age. The surrogate should satisfy certain tests for HIV and should show that she is seronegative for this virus instantly before embryo transmission.
vi. A woman cannot act as a surrogate for more than three times in her lifetime.

Assisted Reproductive Technology Bill, 2013

Rendering to the provision ART (Assisted Reproductive Technology) bill 2013 no woman of age less than 21 years and more than 35 years can performance as a surrogate mother. This bill leads to stroking conditions on foreign couples who are captivating wombs as rent which was the first t by this ART bill 2013. The compensation for surrogacy as per the guidelines by the ART bill 2013 draft

[9] ibid
[10] Infra page no. 2

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will be the private intercession between the surrogate mother and the commissioning couples. The ART bill 2013 leads to disqualify homosexual couples, foreign single individuals, and couples in live-in relationships from having a child through a surrogate mother in India.

Impact of the Surrogacy Bill, 2020 on Surrogacy Contract

Subsequently the Bill has presented strict controlling mechanisms. Surrogacy contracts play a vital role in the technique of surrogacy.

The absenteeism of a surrogacy contract becomes very challenging to decriminalize the system since it could lead to a lot of legal amplifications. The major resilience of surrogacy contracts is to armour the surrogate mothers, the antedating parent(s) and harmoniously the child.

The pecuniary and legitimate issues are occupied by such contracts. Relating to the matter of surrogacy contracts certain conflicting issues arises therein. Those are mainly as like as follows:

a. Whether Surrogacy Agreements amount to baby trade?
b. Whether it is contrasting to public policy and forbidden by Law?
c. Whether the determination of surrogacy is unlawful in lieu of S. 24 of the Indian Contract Act, 1872?

The most controversial issue elevated on surrogacy resolutions is whether such contracts aim in baby selling. The 2020 Bill has put an end to all such speculations and it seeks to put a comprehensive ban on commercial surrogacy.

The supporters as well as the followers of commercial surrogacy specified that a woman who is going to be a surrogate mother has the right to promulgate and can claim compensation for the pregnancy period. However, such an argument does not stand valid in the eyes of law because commercial surrogacy contracts ignore the rights of the surrogate mothers and undermine them.

In the famous *Baby M case*, the court has the utilitarian thought that it is very problematic to get consent in cases of surrogacy. The surrogate mother naturally grows deep attachment with a child which leads to changes of the mind to handover the child to the demanding parents.

Taking into consideration of this matter, the 2020 Bill has postulated that a child born through surrogacy will be believed to be the biological child of the anticipating couple or anticipating woman.

Another question that arises is whether surrogacy contracts are forbidden by any law or opposed to public policy. In certain situations, courts can refuse to enforce a contract on contemplations of public policy.

Many complainers complain that altruistic surrogacy in itself is an immoral bargain since it is against the interests of the child. The SC has applied section 23 of the Indian Contracts Act, to agreements injuring public interest or public welfare. However, it is a difficult task to create a relationship between authorizing surrogacy and public interest, and in such cases public policy doesn't fit in. Further, Indian courts have as well supported all forms of surrogacy contracts, and in fact, documented reproductive rights as part of the right to privacy.

In the case of *Jan Balaz(S) v. Anand Municipality& 6 (S)*[11], the Gujarat High Court held that though some regulations are required for protection of the rights of a surrogate mother, guardianship as well as responsibilities of the fertility clinic, etc., the law will demand for public welfare and its aim is not affect the enforceability of surrogacy contracts. The 2020 Bill seeks to repair the loopholes by authenticating the provisions governing surrogacy.

Further, it cannot be appealed that the objective of surrogacy contracts is unlawful in lieu of section 24 of the Indian Contracts Act since section 35 of the 2020 Bill strictly prohibits commercial surrogacy, and exploitation of surrogate mothers and children born through surrogacy. It penalizes the same. Therefore, the 2020 Bill has ensured that the validity of surrogacy contracts remains intact. Moreover, regulatory bodies have been assigned to implement the safeguards.

Surrogacy (Regulation) Act, 2021

As per the provision of Surrogacy (Regulation) Act, 2021, the following three main provisions have been laid down. These are mainly:

1. A woman who is widow or divorcee and aged about 35 to 45 years or a legally married couple can avail surrogacy as the alternative option to their natural motherhood or parenthood;
2. It strictly bans commercial surrogacy. If anyone doing commercial surrogacy it will be punishable with a imprisonment of 10 years and a fine of up to 10 lakhs rupees.
3. This law allows only altruistic surrogacy where monetary compensation. It is give as the expenditure of medication and all. In this case a surrogate mother is genetically related to these who are seeking a child.

Furthermore this current Act fails to balance the interest of the surrogate mother and the child; it is because there is a question of economic exploitation of poor surrogate mothers. This act tries to enforce the traditional practice of our society that no economic values to women's work which clearly violates value to women's work which clearly violated the fundamental rights under Art. 21 i.e. Reproductive Right of every woman.

[11]AIR 2010 Guj 21

On the other hand by criminalising Commercial Surrogacy this law has denied the legitimate source of earning of a surrogate mother. Due to this, now a day, maximum of women are not willing to be the surrogate mother.

Further this act denies children to the couples who are choosing to get the parenthood of the surrogate child.

This legislation allows Altruistic Surrogacy. It allows a friend, relative as a surrogate mother. But practically it will lead to emotional complications not only for the intended parents but also for the surrogate child and moreover there is deal of risking the relationship during both surrogacy and post birth period. It also limits the option of the intending parents in choosing a surrogate mother among the limited relatives and friends who are willing to do that. So it can be said that examining all the above mentioned factors we can say that there is a need of strict modification of this legislation.

Surrogacy and Indian Judiciary

In famous Baby Manji Yamada v. Union of India's[12] case, the Japanese couple entered into a bond with an Indian woman to be the surrogate mother for their child after the birth of Baby Manji Yamada to an Indian surrogate mother. Further, the commissioning father Mr. Yamada wants to take his child to Japan with them for which he applies for a visa to Japan which the embassy of Japan in India denied as the Japanese civil code did not permit the surrogate child. After this Mr. Yamada wanted to file for an Indian visa which needs a birth certificate an on the birth certificate there is a need for the name of the Father and Mother of the child, but in this case, Mr. Yamada was the genomic father of the baby Manji but vagueness arises in the case of the mother name as there are three mothers for that child- The commissioning mother, the egg donor, and the surrogate mother; seeing this authority refuses to give visa to child Manji as the legal mother was not certain. In the end, the Apex court of India had to intercede and the child Manji was allowed to leave the country with her grandmother.

After the case of Manji, the Supreme Court of India in 2008 held that surrogacy is permitted in India which subsequently increases international assurance in going in for surrogacy in India.

The German Couple Case in this case an issueless German couple has twins over the surrogate mother with the assistance of Anand Infertility Clinic Gujarat. Since the German laws did not admits the surrogacy as a way of parenthood, due to this twins are not considered to be the German citizen so the citizen so the German contracting parents to avoid the predictable hurdle of the Immigration laws approach to the High court of Gujarat for authorizing their surrogate twin with the Indian Passport, on which Gujarat High Court held that the child who born through the surrogate

[12](2008) 13 SCC 51

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mother will carry the name of the surrogate mother but not of the Biological mother and the child should be authorized with the Indian Passport and certifies him as the Indian citizen and the surrogate mother, in turn, had to give the child to the German couples in adoption.

In another case, the Israel gay couple Yonatan and Omer Gher became parents in India in the year 2008 through the help of a surrogate mother who belonged from Mumbai in an infertility clinic in Bandra. After this, both the gay couples vouchsafed with a baby as the Israeli laws do not allow same-sex marriage and the surrogate child so they came to India for their child. After the child born the gay couple left for Israel in the year 2008.

In **K. Kalaiselvi V. Chennai Port Trust, 2013** it Surrogacy was termed as most popular and effective mode of reproduction where women give her consent to be a surrogate mother of a child whom she has to hand over to a contracting party. In this case Rule 3A o Madras Port Trust (Leave) Regulation, 1987 was the matter of argument. In this case the matter of question was that whether a woman employee working in the respondent port trust was entitled to avail herself of maternity leave, to be precise "child care leave" even in case where she opt surrogacy as a option of her motherhood. The Hon'ble court held that the benefit of Rule 3-A ought to be extended to the said employee as well.

In another case of **Geetha v. The Kerala Livestock Development, 2014** the petitioner and her husband opt for gestational surrogacy as a option of their parenthood. They took custody of the baby on the very day of birth as per the agreement. The petitioner applied for the for the maternity leave. In this case the court comes to the decisions that there should not be any discrimination of a woman as far as the maternity benefits are concerned only on the ground that she has obtained the baby through surrogacy.

In **Sushma Devi v. state of Himachal Pradesh and Others, 2021** it was held by the Bombay High Court that the object of the maternity leave is to protect the dignity of motherhood by providing for full and healthy maintenance to the woman and her child. Maternity leave is intended to achieve the object of ensuring social justice to women.

Evaluation and Conclusion

The lawful issues involving to surrogacy are very intricate and need to be addressed by all-inclusive legislation. It can be said that this new recommendation would have both positive and negative aftermaths. It would be ill-fated for a multi-crore industry. As the circular states that if any surrogacy process has started before the circular is issued, in that case, the parties would have to approach the State Health Authorities for consent after completion of the other formalities. Similarly, it would create problems for the women who have already rented their wombs as after the child is

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born it won't be easy for them to get exit permission. However, at the same time, it will prevent the cases of trafficking and abandonment of children after birth through surrogacy by restricting it only to needy infertile parents.

Considering all the pros and cons surrogacy brings a ray of light into the life of individual and couples who are seeking their biological child or do not intend to go for adoption. Framing of appropriate and fair laws which are implemented world over and having consensus statement of international societies on this vital issue are need of the hour. If judiciously used with correct intent this technique can surely prove to be a rewarding experience for all.

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CRITICAL THINKING AND EXPERIENTIAL LEARNING FOR EMPLOYABILITY AMONG UNDERGRADUATE STUDENTS OF TRIPURA WITH REFERENCE TO NEP-2020: AN ANALYSIS

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Abstract

The study aimed to explore undergraduate students' critical thinking and experiential learning for their employability in the coming days. Experiential learning helps students to learn employability skills, while critical thinking provides desired expectations. Different skills help in professional skills like communication, innovation, integrity, critical and time management. In the present study, undergraduate students' critical thinking has been taken to understand their professional skills for employability. The study shows no significant difference between male and female undergraduate students with experiential learning and critical thinking. At the same time, there is a significant difference between low and high achievers of state and central university undergraduate students in experiential learning and critical thinking. The paper also suggests concerning NEP-2020 teaching-learning process among undergraduate students for their employability.

Key Words: Experiential Learning, Critical Thinking, Undergraduate Students, and NEP-2020

Introduction

"Education must be conceived as a continuing reconstruction of experience; the process and goal of education is one and the same thing" (Dewey, 1897).

Learning plays a crucial role in every individual's life. It starts from the birth and ends with the death of an individual. People are constantly learning new things which help them to live their life in a good way. Everyday learning is taking place in one way or another, which helps us to develop our experiences, thinking abilities, social and communication skills etc.

Experiential Learning

Experiential learning in simple words, is the learning process through which a certain level of experience is gained by the individuals or students engaged in a particular course or academic subject. It is the process of learning by doing various activities. The learning which helps students to develop their experience or to increase the level of their experience is called experiential learning. It can be any kind of training, coaching, workshop, teaching etc to create experience among the participants.

Experiential learning is totally opposite of the regular mood of learning where only bookish knowledge is provided to the students or individuals participating in a certain course or educational process. It differs from traditional classroom learning and includes various kinds of activities like seminars, workshops, PowerPoint presentations and projects to help students and individual learners to gain experience about a particular topic.

It is the process of learning by doing, through practical implication of certain topics in the real world to gain experience. It is the process of learning that results from processing and collecting data, information from the surrounding world through direct engagement.

Experiential learning takes place not only in educational institutions but outside the four walls of the educational institution also. It does not take place in a single day but it takes time to develop in the individual. It is the process to engage the students in hand to hand experience, so that the concept can be easier for them to understand. It can engage learners of all ages, backgrounds and experience level to develop themselves. It helps to understand the practical application of knowledge and skills in real world situations, for the development of the learner.

Experiential learning is built on the past experience and knowledge of the individual and it requires active participation of the individual to develop their previous learning.

According to David Kolb, experiential learning is "The process whereby knowledge is created through the transformation of experience. Knowledge results from the combinations of grasping and transforming the experience."

Carl Rogers stated that "Experiential education, or learning by doing, is the process of actively engaging students in an authentic experience that has benefits and consequences. Students make discoveries and experiment with knowledge themselves, instead of hearing or reading about the experiences of others".

Experiential learning has a lot of advantages in the teaching learning process some of the methods which help to provide experiential learning like projects/assignments/fieldwork, Internships, co-curricular activities, group discussion, use of ICT, and educational or excursion trips to gain

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experience and critical thinking among undergraduate students for better employability in coming days.

Critical Thinking

Critical thinking is basically reflective thinking. It means to question any thought, idea, theory and information that does not satisfy our concerns. We can question others' thoughts and decisions as well as ours also. The critical thinker must have to be logical and should accept what is right and wrong. Critical thinking does not mean biased or partial towards any particular thought or reasons of oneself as well as others.

Critical thinker must be an active participant in all debate and discussion; he/she should not be a passive one and tries to defend arguments and points made by him/her. Critical thinking must be an open minded process and willing to see things from other people's perspective.

According to Elder and Paul that "Critical thinking is that mode of thinking - about any subject, content, or problem - in which the thinker improves the quality of his or her thinking by skilfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them."

Similarly, Facione stated that "Critical Thinking is judging in a reflective way what to do or what to believe".

Some of the activities to develop critical thinking skills among the students are as debate and discussion, assignment, presentation; mentor and mentee work with peers.

The development of critical thinking among the students is very much important to survive in today's modern competitive world. If students will not be able to think critically, they will not be able to progress in the modern times. Only bookish knowledge can't help to develop critical thinking skills among the students. It can be seen that many students with good academic achievements, knowledge and degrees had not been able to survive or adjust in the society or not been able to solve real life problems just because of the lack of proper critical thinking ability among them. It ultimately affects both the individual and the society and the reason behind this is that the students are not being taught or engaged in activities during their school and college time, which will help them to develop their critical thinking skills.

National Education Policy 2020

The vision of the policy is to transform the education system of the nation and to instill among the learners a deep rooted pride of being an Indian. The policy has also recommended for critical thinking and experiential learning in higher education through flexible learning, focused on

practical education, and credit based learning. It also suggests that multidisciplinary and holistic education for all.

The new education policy aims to facilitate an inclusive, participatory and holistic approach, which takes into consideration field experiences, empirical research, stakeholders feedback, as well as lessons learned from best practices. It is a progressive shift towards a more scientific approach to education.

Rationale of the study

There is a big gap between the present learning process, activities of the UG level and that of the step, activities recommended by NEP-2020 to be in the UG level. Because of this the students are effecting badly. Few researchers have conducted their study to see the effect of experiential learning and critical thinking among students for employability is as given below:

Naveen (2022) conducted a study on 'NEP, 2020: general education embedded with skill and vocational education'. He found that development of skills among the students of higher education institutes, through the integration of various vocational courses. **Kumar, (2021)** studied on the 'New Education Policy (NEP): A Roadmap for India 2.0'. He concluded with his findings on the idea of excellence, accountability, morality, financial, overall and multi disciplinary approach. For that reason it will bring major changes in the service and educational sector of the nation. **Sawant and Sankpal (2021)** stated in their study on National Education Policy 2020 and Higher Education: A Brief Review and found that it has given a new look and structure for the higher education sector with wide range, plenty of provision and opportunities with dynamic comprehensive institutes to lead the higher educational field. It also provided universal education through flexible curriculum, unification of study, inclusion of vocational education and entry exist at multiple levels in the educational course. It suggests that simplification of independent governance in the institutional administration to provide autonomy in the areas of academic, administrative and economic fields. **Pathak (2021)** conducted a study on 'NEP 2020: A road map to Vocational Development and found that vocational education will be given to students along with their regular academic studies. **K and Ambekar (2021)** studied on NEP 2020 on higher education and route sustainable development and concluded with flexible learning, setting up foreign institutes in India for create competition and multidisciplinary institutions for all. **Kumar, & Meenakshi (2021)**, conducted a study on "Professional Competence Attributes for Physical Education Trainee Teachers: New Education Policy (Nep 2020) Perspective". The study found that Professional enhancement in physical education of the teachers and the students will engage them beyond the bookish knowledge and help the teaching-learning process much more effectively. It also suggests that national and international higher education institutes must have physical education courses in their institutions and should engage students and faculty members in

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various activities related to physical education for their development. **Faith et al. and Malik et al. (2022)** studied on Entrepreneurship and employability. The study suggested that in India students prefer to take admission in general courses rather than joining vocational courses. Unless and until there are good job opportunities, prestige, awareness and social acceptance, it is not possible to attract students in these courses. **Sharma (2021)** conducted a study on, 'National Education Policy (NEP) 2020 for Students: A Review'. The study found that vocational education can play a significant role in changing the situation, which is emphasized in NEP-2020. There are some barriers in implementation of this policy and it will take some time to give us results, but once implemented properly it will bring a significant change in the nation. **Kheria (2020)** conducted a study on "NEP 2020: Features, Challenges and Prospects". He stated based on the study that ICT integrated teaching-learning, combining various subjects for teaching-learning, encouraging the use of different languages in teaching-learning and focusing on co-curricular activities will help to transform the Indian education system once and for all. **Kalyani (2020)** studied on the NEP 2020 with Special Reference to the Future of Indian Education System and Its Effects on the Stakeholder". He suggested that NEP-2020, which was introduced after 34 years, will bring significant changes in the education system of the nation. Previous policy was not matching with the current requirement of the industries and education of the individuals, that's why there is a lack of qualified individuals, for which the unemployment rate was increasing and affecting the growth and production rate of the nation. All these reasons, ultimately leading to frustration and depression among the youths.

If this policy is implemented properly in the ground level then it will help to change the total learning environment in the colleges and higher education institutes which will ultimately benefit both the students and the faculty members.

Objectives

- To understand the experiential learning and critical thinking of low and high achievers undergraduate students of West Tripura with respect to NEP-2020.
- To see the experiential learning and critical thinking of undergraduate students of West Tripura with respect to gender.
- To compare the experiential learning and critical thinking of undergraduate students of West Tripura in respect to institute.

Hypothesis of the study

- There is a significant difference between high and low achievers' undergraduate students of west Tripura in relation to their experiential learning and critical thinking with respect to NEP-2020.
- There is a significant difference between Undergraduate boys and girls of west Tripura with respect to their experiential learning and critical thinking.
- There is a significant difference between undergraduate students' of state university and central university in relation to their experiential learning and critical thinking.

Methodology of the study:

In the present study, researchers have used survey method research design. In the study 'Experience Learning and Critical Thinking' are independent variables (IV) and the 'NEP-2020' is dependent variable (DV).

In the present study, the investigators have taken total 285 samples from different higher education institutes of Tripura. The samples were selected through Random Sampling technique in the present study. The present study was delimited to the west Tripura due to the time and resource limitation.

Tools of the study:

In the present study, researchers have used a Self made questionnaire to complete the study. In this questionnaire 20 questions are there. The Questionnaire consists of 20 questions with options of 'YES' and 'NO' are given below in each one. The scale is measured by scores given to YES = 1 and NO = 0. So the highest score you can get from this scale is 20 and the lowest score on this scale is 0. There is no negative scoring through this scale.

Procedure of Data Collection

In the present study, the investigators visited Degree colleges of west Tripura physically and interacted with students with due permission from the Principal of the institution for data collection from students of degree college. The researchers had used a questionnaire for collection of data.

Statistical Technique

The researcher had used appropriate descriptive and inferential statistics to analyze and interpret the data of the study. The statistical techniques like Mean, Standard Deviation, and the t-test. In the present study, the level of significance of the t-test was 0.05.

Data Analysis and Interpretation:

In the present study the data are analyzed in terms of descriptive statistics, graphical representation and inferential statistics.

The obtained raw scores in response to different variables have been arranged and analysed accordingly. The detail analysis is given in table number-1.

Table-1: Descriptive statistics of Mean, SD, t-value of high and low achiever students of undergraduate students in relation to their experiential learning and critical thinking.

Category	Number	Mean	SD	df	t-value	p value
Higher Achiever	158	9.92	1.52	283	26.18	0.01
Low Achiever	127	5.6	1.24			

The table number 2 states that, there is a significant difference between the high and low achiever students of undergraduate students in relation to their experiential learning and critical thinking. There were a total 158 high achiever students and 127 low achiever students. The high achiever students have a Mean value of 9.92 and SD 1.52 and the low achiever students have a Mean value of 5.6 and SD 1.24, both of their df is 283 and the t-value is 26.18. The statistical description is given in table number-1 and graphical representation is shown below in figure-1.

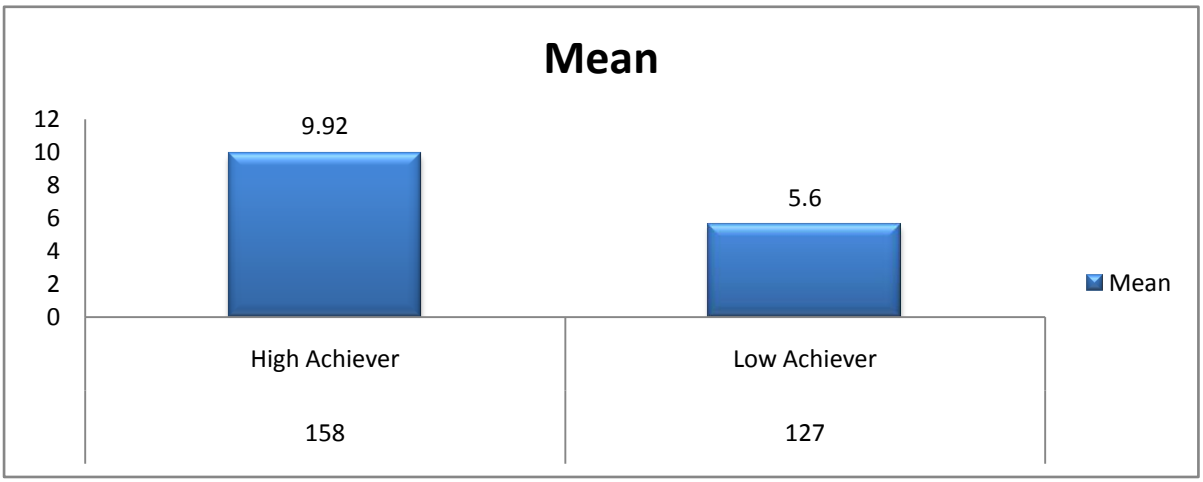

Figure-1: Histogram graph of Mean of high achievers and low achievers of undergraduate students in relation to critical thinking and experiential learning.

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The researchers have also analyzed the data based on male and female undergraduate students' experiential learning and critical thinking with respect to NEP-2020 in relation employability. The detail discussion has made in table number-2.

Table-2: descriptive and inferential statistics of Male and Female undergraduate students' experiential learning and critical thinking.

Category	Number	Mean	SD	df	t-value	p value
Boys/Male	105	7.74	2.68	283	1.32	0.09
Girls/Female	180	8.16	2.45			

The table number 2 states that, there is no significant difference between male and female undergraduate students' experiential learning and critical thinking with respect to NEP-2020 in relation employability. There were total 105 boys students and 180 girls students. The male students have a Mean value of 7.74, SD 2.68 and the female students have Mean value of 8.16 and SD 2.45, both of their df is 283 and the t-value is 1.32. The graphical representation has given below in figure-2

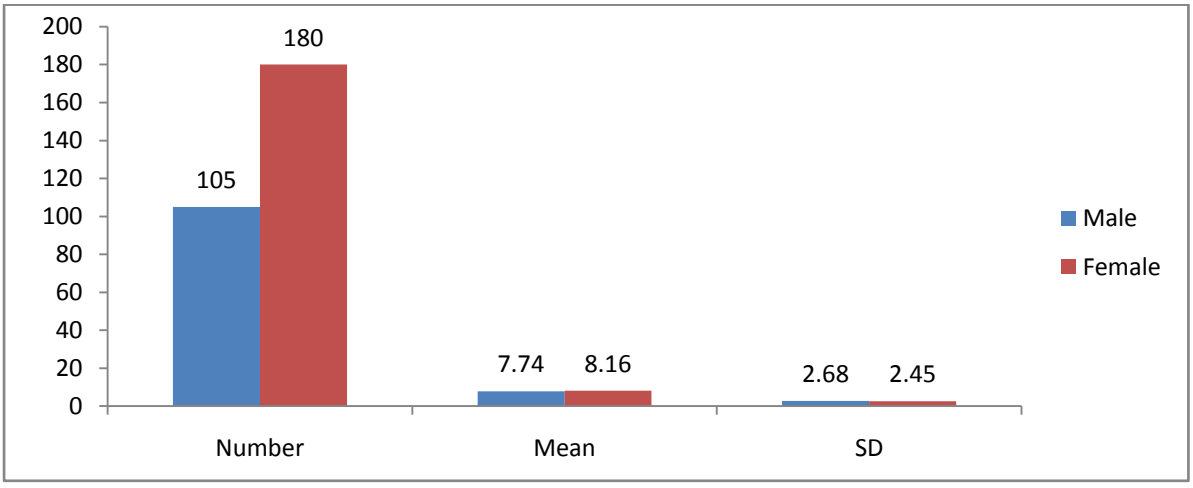

Figure-2: Histogram graph of mean value of male and female undergraduate students in relation to critical thinking and experiential learning.

In the last part of the data, the investigators have draw the descriptive and inferential statistics table to understand awareness among undergraduate students of state and Central University in relation to

their experiential learning and critical thinking for their employability. The detail description has given in table number-3.

Table-3: Descriptive and Inferential analysis of undergraduate students of state and Central University in relation to their experiential learning and critical thinking for their employability

Category	Number	Mean	SD	df	t-value	p value
State University	143	8.36	2.54	283	2.416	0.05
Central University	142	7.64	2.5			

The above table number 3 states that, there is a significant difference between state university students and central university students in relation to their experiential learning and critical thinking. There were 143 State University Students and 142 Central University students. The State University students have a Mean Value of 8.36 and SD 2.54 and the Central University students have Mean value of 7.64 and SD 2.5, both of their df is 283 and the T-value is 2.416. The t-value is accepted at 0.05 levels and not at the 0.01 level. The graphical representation has shown in the figure-3.

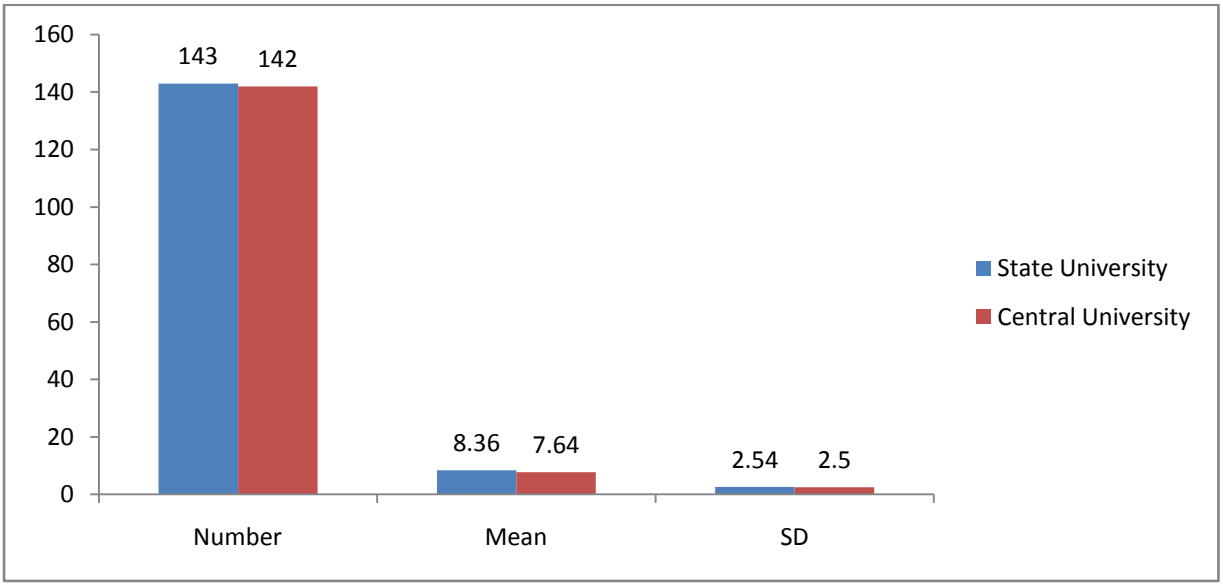

Figure-3: Histogram graph of mean value of undergraduate students of state and Central University in relation to their experiential learning and critical thinking for their employability

Major findings

- The present study found that there is a significant difference between high and low achiever undergraduate students in relation to their experiential learning and critical thinking for their employability.
- The study also found that there is no significant difference in their employability between male and female undergraduate students with regard to their experiential learning and critical thinking.
- The study showed that there is a significant difference undergraduate student of state university and central university in relation to their experiential learning and critical thinking for their employability.
- The study has also focused on NEP-2020, which has reflected in different higher education institutes of Tripura; it plays a significant role in transforming the higher education institutes (HEIs) of the state. The HEIs have implemented its recommendations for better outcomes among the students.
- Undergraduate students and their teachers have used ICT in educational activities; it helped in developing their experiential learning and Critical thinking and also selecting the information about different employment.
- The study also found that due to lack of time, and engagement of students and teachers many activities had not been completed due to the engagement of faculty members in their other work.

Conclusion

The present study discovered a sizable gap between UG level high achiever and low achiever students in terms of their experiential learning and critical thinking. Due to their dedication to their studies, those who spend more time participating in educational activities have better critical thinking skills and experience than those who did not. Students from State universities and Central universities differ significantly in terms of their experiential learning and critical thinking skills. The educational activities, management, and curricula of the colleges affiliated with the two distinct universities differ.

Students in the state universities in the state of Tripura participate in more educational activities than students at the central universities; therefore they have a greater capacity for critical thinking and experiential learning.

In terms of their critical thinking and experiential learning, undergraduate students who are boys and girls do not differ much. For both boys and girls in undergraduate students, the NEP-2020 has created equal possibilities for them to flourish through participation in various educational activities. Because both boys and girls took the same activity or course, they developed the same degree of experience and critical thinking skills.

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In the end, The National Education Policy-2020 has created the foundation of a roadmap for dynamic education keeping the essence of ancient ethos of Indian tradition, culture, values, to build new nation with futuristic vision.

Educational Implication

The present study was carried out in the Government degree colleges of west Tripura district of Tripura to check the experiential learning and Critical thinking of the undergraduate students.

The current study reveals that critical thinking and experience learning are crucial to the growth of undergraduate students. Many measures that will aid in fostering students' experience and critical thinking through their learning activities have been highlighted by the National Education Policy-2020. To involve students in diverse activities that will aid in their general development, it is now entirely up to the State and Central governments, college authorities, specific departments, and faculty members. The UG and higher education systems' educational systems will significantly alter if the efforts that the policy has discussed are appropriately executed at the local level.

Students, teachers, teachers' educators, administrators, curriculum creators, textbook authors, educational planners, parents, minority education trustees, religious educational societies, and NGOs engaged in the field of education can all benefit from the study's findings.

Suggestion of further research

Further the study may be conducted in various fields related to this topic. The experiential learning and critical thinking of students with respect to NEP-2020 can be extended at different levels. This is mentioned below:

- Study may be conducted among Three years Undergraduate and Integrated Undergraduate students of government and private degree colleges.
- Study may be conducted among professional Undergraduate and Integrated professional Undergraduate students of government and private degree colleges.
- Study may be conducted among professional Undergraduate and Integrated professional Undergraduate students of government and private degree colleges.
- Study may be conducted among professional postgraduate and integrated postgraduate students of government and private degree colleges.
- The study may be extended to undergraduate and postgraduate students of whole Tripura or entire north-eastern states.

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1 RANKED Among Top Engineering Colleges of Tripura CSR - GHRDC Ranking 2020

2 RANKED Top Engineering Colleges of Excellence (Govt. & Pvt.) in India CSR - GHRDC Ranking 2020

27 RATING Top 100 Engineering Colleges 2021 siliconindia

32 RANKED By INDIA TODAY MDRA Best Universities Survey 2020

8 RANKED 'Beginner' under the category University & Deemed to be University (SELF-FINANCE/PRIVATE/TECHNICAL) ARIIA 2021

About The University

ICFAI University, Tripura was established in 2004 through an Act of State Legislature (Tripura Act 8 of 2004). The University has been approved by the University Gants Commission, under section 2(f) of the UGC Act, 1956 and the University is empowered to award degrees under section 22 of UGC Act, 1956.

Accreditations

- University Grants Commission (UGC)
- National Assessment and Accreditation Council (NAAC)
- Bar Council of India (BCI)
- National Council for Teacher Education (NCTE)
- Distance Education Bureau (DEB)
- Rehabilitation Council of India (RCI)
- Tripura Nursing Council (TNC)
- Indian Nursing Council (INC)
- MSME(HI/BI), Govt of India has recognised as Host Institute to Support for Entrepreneurial and Managerial Development of MSMEs through Business Incubators
- Established Skill Management & Accreditation of Training centre (SMART) recognised by Ministry of Skill Development & Entrepreneurship, NSDC, Govt of India.

Membership

- Member of the Association of Indian Universities, New Delhi, India
- Member of the Association of Commonwealth Universities,London, UK.
- Member of Institute of Engineers (India)
- Members of Association of Management Development Institutions in South Asia (AMDISA)
- Registered Member with Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India
- Member of Confederation of Indian Industry (CII).
- Member of Vijnana Bharati.
- Member of Academy of Hospital Administration, Govt of India.
- National Cyber Safety and Security Standards (NCSSS)
- National HRD Network (NHRDN), Gurgaon
- Inter- University National Cultural Board (IUNCB)
- Amazon Internet services Pvt. Ltd for AWS (Cloud Computing) Program
- Oracle Academy bearing ID No.: 23681394
- Indo-Australian Chamber of Commerce
- VMware IT Academy

Ranking/Certificates

- Ranked 7th among the Top Engineering Colleges of Excellence (Govt. & Pvt) in India by CSR GHRDC- Engineering Ranking 2020.
- ICFAI University Tripura is ranked 32 by India Today- MDRA Best Universities Survey 2020
- Ranked 27 in the Top 100 Engineering College ranking survey 2020 and ranked 3rd in the Top 10 Engineering colleges 2020 region wise ranking announced by Silicon India.
- Department of Chemistry of ICFAI University Tripura Nature Index ranked is 82nd in India as on 25th April, 2020.
- Established 'Institute Innovation Council (IIC) as per norms of Innovation Cell, Ministry of MHRD, Govt. of India
- Registered with NGO Darpan, Niti Ayog, Govt. Of India
- Certified by ISO 9001: 2015
- Best Universities & Colleges 2018-19 awarded to ICFAI University Tripura in the special category by Rubber Skill Development Council (RSDC).
- ICFAI University Tripura certified by Directorate of Social Welfare & Social Education.
- ICFAI Univesity Tripura got AAA rating in Northeast India by Careers360 Magazine– India's Best Engineering Colleges 2020
- ICFAI Law School got AA+ rating by Careers360 Magazine among India's (East Zone) best law Colleges 2021
- ICFAI University Tripura is recognized in the band "BEGINNER" under the category "University & Deemed to be university(Private/Self Financed)(Technical)" in ARIIA 2021

Science and Technology Programs

- B.Tech (CE, ME, ECE, EEE, CSE)
- B.Tech (Lateral Entry)
- BCA
- Integrated MCA
- MCA
- M.Tech

Basic Science Programs

- B.Sc (Hons) Physics
- B.Sc (Hons) Chemistry
- B.Sc (Hons) Mathematics
- M.Sc Physics
- M.Sc Chemistry
- M.Sc Mathematics

Education Programs

- B.Ed
- M.A (Education)
- M.Ed

Liberal Arts

- B.A-English (Hons.)
- B.A-psychology (Hons.)
- M.A-(English)
- M.A-psychology

Nursing Program

- ANM (Auxiliary Nursing Midwifery)

Allied Health Science Programs

- BSc. in Emergency Medical Technology
- BSc. in Cardiac Care Technology
- BSc. in Dialysis Therapy Technology
- Bachelor in Health Information Management
- Bachelor in Science in Medical Laboratory Technology (BMLT)
- Master of Science in Medical Laboratory Technology (MMLT)

Management & Commerce Programs

- BBA
- B.Com (Hons.)
- MBA
- MHA (Master of Hospital Administration)
- M.Com

Law Programs

- BA-LLB (Hons.)
- BBA-LLB (Hons.)
- LL.B
- LL.M (2 Years)

Special Education Programs

- B.Ed Spl. Ed (ID)
- D.Ed.Spl Ed (ID)
- M.Ed Spl. Ed (ID)

Physical Education & Yoga

- B.P.Ed
- D.P.Ed
- PGD in Yoga
- B.P.E.S
- B.P.E.S (Lateral Entry)
- M.P.E.S

Clinical Psychology Program

- M.Phil in Clinical Psychology

Library Science Program

- M.Lib.I.Sc (Integrated) - 2 Year
- M.Lib.I.Sc - 1 Year
- B.Lib.I.Sc - 1 Year

Certificate Programs

- French
- Data Science
- HR Analytics & HR Audit

Programs Offered at ICFAI University Tripura

Science and Technology

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B. Tech (CE, CSE, ECE, ME, EEE)	4 Years	Pass in 10 + 2 (Phy/Chem/Math) with minimum 45%, (40 % in case of SC/ST/ OBC)aggregate marks	50,000	57,500	IT,ITEs, Manufacturing,Companies, Corporates, Telecom, Banks, Govt. Services
B. Tech - Lateral Entry (CE, CSE, ECE, ME, EEE)	3 Years	Pass in 3 - year diploma course with minimum 45 % (40 % in case of SC/ ST/ OBC) aggregate marks	50,000	57,500	IT,ITEs, Manufacturing,Companies, Corporates, Telecom, Banks, Govt. Services
BCA	3 Years	Pass in 10 + 2 (any Discipline) examination	29,000	32,000	IT,ITEs, Corporates, Banks,Govt. Services, NGO's.
Integrated MCA	5 Years	Pass in 10 + 2 (any Discipline) examination	29,000	32,000	IT,ITEs, Corporates, Banks,Govt. Services, NGO's.
MCA	2 Years	Graduation in any discipline, with 40% and above aggregate marks.	30,000	33,000	IT,ITEs, Corporates, Banks, Govt. Services, NGO's, Research
M.Tech	2 Years	Valid GATE Scorer with B.Tech /B.E in Civil Engineering or B.Tech /B.E in Civil Engineering with 60% marks	60,000	65,000	Research, consultant to Pvt. Organization in the field of flood forecasting, flood inundation, flood disaster management, Entrepreneur.

Basic Science

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.Sc. Physics (Hons.)	3 Years	Pass in 10 + 2 with 40 % marks in Physics & pass in maths	29,000	31,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
B.Sc. Chemistry (Hons.)	3 Years	Pass in 10 + 2 with 40 % marks in Chemistry	29,000	31,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
B.Sc. Mathamatics (Hons.)	3 Years	Pass in 10 + 2 with 40 % marks in Mathematics	27,000	29,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
M.Sc. Physics	2 Years	Graduate with 45 %(40 % in case of SC/ST/ OBC) marks in Physics	35,000	37,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
M.Sc. Chemistry	2 Years	Graduate with 40 % marks in Chemistry from a recognized University	35,000	37,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
M.Sc. Mathematics	2 Years	Graduate with 40 % marks in Mathematics	28,000	30,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate

Liberal Arts

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.A - English (Hons.)	3 Years	Pass in 10 + 2 (any Discipline) with 40 % marks in English	25,000	27,000	Jobs in Govt., Teaching in Schools/Educational Administrators/ Corporate, Banks, Telecom, Media, Journalism
M.A - English	2 Years	Graduate in any Discipline with minimum 45 % (40% in case of SC/ST/ OBC) aggregate marks	26,000	28,000	Jobs in Govt., Teaching in Schools/Educational Administrators/ Corporate, Banks, Telecom, Media, Journalism/ Research
B.A - Psychology (Hons)	3 Years	Pass in 10 + 2 (any Discipline) with 50 % (45% in case of SC/ST/ OBC) marks	22,000	24,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate
M.A - Psychology	2 Years	Graduate with 45 %(40 % in case of SC/ST/ OBC) marks in Psychology	24,000	26,000	Teaching in Schools/ Colleges/ Educational Administrator/ Corporate

Library And Information Sciences

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.Lib.I.Sc	1 Year	Graduate in any discipline	21,000	23,000	School/ College/ University/ district/ State / National Librararies, Bank, Govt. Services, NGO's, Research
M.Lib.I.Sc- Integrated	2 Years	Graduate in any Discipline	21,000	23,000	School/ College/ University/ district/ State / NationalLibrararies, Bank, Govt. Services, NGO's, Research
M.Lib.I.Sc	1 Year	Graduate with B.Lib.I.Sc	21,000	23,000	School/ College/ University/ district/ State / NationalLibrararies, Bank, Govt. Services, NGO's, Research

Law

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
BBA-LLB Integrated	5 Years	Pass in 10 + 2 with minimum 45 % (40 % in case of SC/ST, 42% in case of OBC) aggregate marks	30,000	32,000	Corporates, Banking, Judiciary, Legal Practice, NGO's IPR
BA-LLB Integrated	5 Years	Pass in 10 + 2 with minimum 45 % (40 % in case of SC/ST, 42% in case of OBC) aggregate marks	30,000	32,000	Corporates, Banking, Judiciary, Legal Practice, NGO's IPR
LLB	3 Years	Graduate in any Discipline with minimum 45 % (40 % in case of SC/ST, 42% in case of OBC) aggregate marks	32,000	34,000	Corporates, Banking, Judiciary, Legal Practice, NGO's IPR
LLM	2 Years	Graduate with LLB degree (Recognised by BCI)	35,000	40,000	Corporates, Banking, Judiciary, Legal Practice, NGO's IPR, Research

D* = Domicile: Students from North East States (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura). **ND**=** Non-Domicile: Students from states other than North East states.

Management Studies

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.Com (Hons.)	3 Years	Pass in 10 + 2 examination in commerce or Science with 45% (40% in case of ST/ SC/OBC) marks	26,000	28,000	Banks, Financial Services, Corporates
BBA	3 Years	Pass in 10 + 2 (any Discipline) examination with minimum 40% marks	30,000	32,000	Banks, Financial Services, IT, Insurance, Telecom, Corporates, Consulting Companies.
MBA	2 Years	Graduate in any discipline with minimum 50 % (45 % in case of SC/ST/OBC) aggregate marks	65,000	75,000	Banks, Financial Services, IT, Insurance, Telecom, Corporates, Consulting Companies, Research
M.Com	2 Years	B.com (Pass or Hons) from any recognized University/ Institution with 45% marks in aggregate Or equivalent grades. 5% relaxation will be given to SC, ST, and OBC candidates.	26,000	28,000	Banks, Financial service, Corporate, Tax consultants, Finance Advisor/Planner, etc
Master of Hospital Administration(MHA)	2 Years	Graduate with 50% aggregate marks (Preference will be given to MBBS, BDS, BHMS, B.Sc Nursing, BPT, BAMS, B.Sc Allied Health Science, Veterinary Sciences & B.Sc Pharma)	65,000	75,000	Hospitals(Government /Private), NUHM, NRHM, NRLM, Healthcare consultancy firm, Hospitality industry, Medico-legal consultancy firm, Insurance sector (Government/ Private)

Allied Health Sciences

Program	Duration	Eligibility	Program Fee Per Semester(Rs)	Career Prospects Employment Opportunities
Bsc. in Emergency Medical Technology	4 Years	Pass in 10 + 2 (Science Discipline) with 45% marks in PCB (5% relaxation for SC/ST/OBC Candidates)	35,000 (3 years/6 semester) & 10,000 (Last 1 year/ 2 semester)	Opportunity in Government /Private hospital having ICU/ITU/Critical care unit, Demand in disaster management team for both state/central government, army/navy/airforce. Eligible for Post graduation courses.
Bsc. in Cardiac Care Technology	4 Years	Pass in 10 + 2 (Science Discipline) with 45 % marks in PCB (5% relaxation for SC/ST/OBC Candidates)	35,000 (3 years/6 semester) & 10,000 (Last 1 year/ 2 semester)	Opportunity in Government /Private Hospitals in cardiology department, different cath- labs or diagnostic centers. Eligible for postgraduate courses.
Bsc. in Dialysis Therapy Technology	4 Years	Pass in 10 + 2 (Science Discipline) with 45 % marks in PCB (5% relaxation for SC/ST/OBC Candidates)	35,000 (3 years/6 semester) & 10,000 (Last 1 year/ 2 semester)	Opportunity in Government /Private hospitals, NRHM, NUHM, NGO, clinics/healthcare setup offering dialysis treatment. Eligible for Post Graduation courses in dialysis.
Bachelor in Health Information Management	4 Years	Pass in 10 + 2 (any Discipline) with 45 % marks (5% relaxation for SC/ST/OBC Candidates)	35,000 (3 years/6 semester) & 10,000 (Last 1 year/ 2 semester)	Opportunity in Government / Private hospitals, diagnostic centers, NRHM/NUHM, legal firms,Healthcare consultancy .Eligible for Post Graduate courses.
B.Sc. Medical Lab Technology (BMLT)	4 Years	Pass in 10 + 2 (Science Discipline) with 45% marks in PCB (5% relaxation for SC/ST/OBC Candidates)	26,000 (3 years/6 semester) & 10,000 (Last 1 year/ 2 semester)	Opportunity in Government /Private hospital having ICU/ITU/Critical care unit, Demand in disaster management team for both state/central government, army/navy/airforce. Eligible for Post graduation courses.
M.Sc. Medical Lab Technology(MMLT)	2 Years	Candidate must have passed degree, e.g. B.Sc. MLT/ B.Sc. Physiology/ Microbiology/ Biotechnology/ Biochemistry or equivalent B.Sc. Biosciences from a recognized University	60,000 (D*) 65,000 (ND)	Opportunity in Government / Private sector, Lab Technician, Medical Lab Incharge, Research and Development Manager (Laboratory), Technical Officer etc. Can pursue research or can flourish in academics as well

Education

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.Ed.	2 Years	Graduate or post graduate in any discipline with minimum 50 % (45 % in case SC/ST/ OBC) aggregate marks	45,000	47,000	Teaching in Secondary level
MA - Education	2 Years	Graduate in any discipline	20,000	22,000	Teaching in Schools/Educational Administrators/ Research
M.Ed.	2 Years	B.Ed. (1/2 years)/ B.EL.ED/B.Sc.B.Ed./ B.A B.Ed./ D.EL.Ed./D.Ed. with a Bachelors degree. 50% marks at all the levels	48,000		Teaching in Teacher Education

Physical Education and Yoga

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.P.Ed	2 Years	Graduate or post graduate in any discipline with minimum 50 % (45 % in case SC/ST/ OBC) aggregate marks	22,000	24,000	Jobs in Schools/ Colleges/ University , Physical Trainer
D.P.Ed	2 Years	Pass in 10+2 or equivalent with 50% of marks in any stream	20,000		Jobs in Schools/ Colleges/ Physical Trainer
PGD in Yoga	1 Year	Any graduate	16,000	21,000	Yoga Teacher in Schools, Yoga Therapist/ Yoga Psycologist/ Yoga Inspector in MNC's, Health Club, Yoga Club
B.P.E.S	3 Years	Pass in 10 + 2 examination or equivalent from any recognised education Board/ University	20,000		Jobs in Schools/ Colleges/ University , Physical Trainer
B.P.E.S(Lateral Entry)	1 Year	Pass in two years diploma in Physical education	20,000		Jobs in Schools/ Colleges/ University , Physical Trainer
M.P.E.S	2 Years	Candidates must have passed with at least 50% marks for Gen/OBC and 45% for ST/SC category. B.P.Ed (4yrs. Integrated)/ B.PEd. (1yr or 2 yr)/ BPE(3yrs)/ B.Sc (Physical Education)/ BPES (3yr).	30,000	35,000	Jobs in Schools/ Colleges/ University , Physical Trainer/Sports/Job in Govt. and Private sector as teacher,instructor, coach etc.

Special Education

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
B.Ed. Spl.Ed. (ID)	2 Years	Graduate or post graduate in any discipline with minimum 50 % (45 % in case SC/ST/ OBC) aggregate marks	40,000	42,000	Teaching in Secondary level and at special schools
D.Ed.Spl.Edu (ID)	2 Years	Pass in 10 + 2 (any Discipline) with minimum 50% marks	25,000		Special schools, Sarva Siksha Abhiyan/ Resource teacher in General School/ Integrated/ Inclusive setup
M.Ed.Spl.Ed(ID)	2 Years	B.Ed. Spl. Ed (ID) / B.Ed. General with D.Ed. Spl. Ed (ID) with 50% marks (RCI).	37,500		Professional preparation of teacher educators-engaged in continuous professional development of teachers
M. Phil in Clinical Psychology	2 Years	M.A. / M.Sc degree in the Psychology with 55% marks in aggregate, Preferably with special paper in Clinical Psychology.	72,000		Qualified professional & extensive inputs & widesp-read Clinical experience to acquire the necessary skills in the area of Clinical Psychology

Nursing Science

Program	Duration	Eligibility	Program Fee Per Semester(Rs) (D)*	Program Fee Per Semester(Rs) (ND)*	Career Prospects Employment Opportunities
ANM	2 Years	Pass in 10 + 2 (any Discipline)examination	43,000		Hospitals(Government /Private), NUHM, NRHM, NRLM, Healthcare consultancy firm, Hospitality industry, Medico-legal consultancy firm, Insurance sector (Government/ Private)

Certificate Program

Program	Duration	Eligibility	Program Fee (Rs)
Data Science	6 Months	Minimum graduation in Science or Engineering.	25,000
HR Analytics & HR Audit	4 Months	Graduation with Computer Literacy	35,000
French	6 Months	Minimum pass in 10+2 (in any discipline)	15,000

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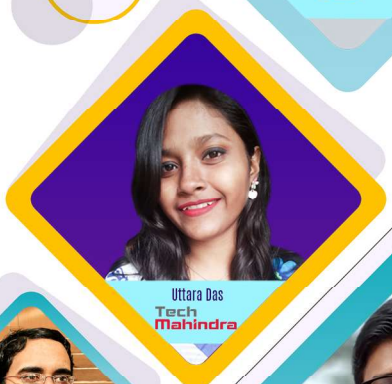
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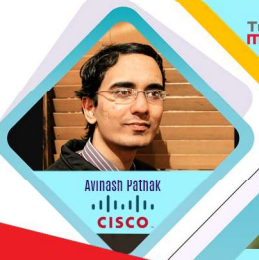
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HDFC BANK
pinclick
BHARAT
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- Smart Class Rooms
- Labs / Workshop
- Enriched Library
- Hostels
- Full Campus is Under cctv Surveillance
- Yoga
- Medical Centre
- Gymnasium
- Soccer Field
- Basket ball court
- 24 x7 Ambulance Service
- 24 hours Power Generator back-up etc.
- Full Campus is Covered by Jio wifi, BSNL wifi, ICFAI wifi
- Badminton court

Unique Features

- Fee concession for students from North Eastern States
- N J Y Memorial Scholarships
- Merit Scholarships during Admission and also during study at University
- Signed MOA with IIT Bombay for setting up North Eastern Region Spoken Tutorial FOSS HUB at ICFAI University Tripura
- French & Chinese Language as Elective Course for all Programs
- Setup Virtual Lab in Collaboration with IIT, Delhi.

ICFAI University Tripura
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