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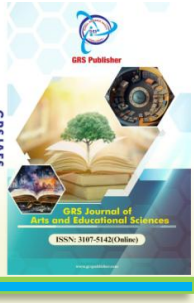

Effectual implementation of ERP based Learning methodology and its effectiveness during Covid

Dr. Vijaya Karthik S V

Software Engineer, Warsaw, Poland.

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Corresponding Author:
Dr. Vijaya Karthik S V

Abstract: Based on proposing a solution to the effectiveness of ERP based learning methodology at the time of COVID-19 outbreak, this investigation proposed a framework for consideration of ERP based learning methodology. This study compares the situation that held in learning methodology based on ERP, before the time of pandemic and after the period of covid-19. The backbone of the investigation, ie., samples that served in this investigation are academicians such as administrators, principles, various heads, teaching faculties and students. For the purpose of data accuracy, the sampling process such as online survey, qualitative and quantitative technique can be included in the data collection to access the current ground level accuracy of data. At last, this investigation summarizes the effectiveness of implementation of ERP based Learning methodology also its effectiveness during the period of covid pandemic through the comparison of the same with non-pandemic scenarios.

Keywords: Enterprise Resource Planning (ERP), covid-19, teaching and learning, methodology and education.

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Introduction

This investigation focuses on the implementing Enterprise Resource Planning (ERP) based learning methodology for educational setup also, this study sharply pin points the effectiveness of implementing ERP during Covid period. [1] Resplendently, 65% of researchers believe that implementing ERP systems has a moderate chance of throbbing in the system. ERP based learning methodologies software assist to supervise and manage the routine activities including administration, teaching, curriculum management, maintenance of student's data, students attendance, fee record management, assignment management and so on. Recently, in this pandemic situation, especially education and higher education need more concentration from their associate authorities to maintain the standard in learning methodologies. Learning methodologies help to arouse learners in reflection and in developing problem solving skills and also assist the learners to gain experience in technical skills and acquire, maintain social relationships within the peers and also in the societal context. In short, educational authorities need support for the successful maintenance of methodological aspects in the education sector. Many research studies concerned with ERP based learning methodology in educational setup have resulted in effective educational performance of learners with better learning outcomes. This is due to the interdisciplinary nature of ERP systems, which convert individuals to apply their personnel competency into practice to improve problem-solving skills such as exploratory searching, critical thinking and decision making, also ERP systems assist in organizing any process in a short time [2]. In short, implementing ERP in methodology is now making the awaked and otherwise tedious task in educational management easier and more efficient. Meanwhile this pandemics ituationmakes dis-connectivity within the individuals in educational setup, and this implementation of ERP in educational background areas (schools, colleges, institutes and universities) can help with a platform and this help to supervise various functions across departments, without manipulating trouble in the total system. So in this investigation, focuses the effectiveness of implementing ERP based learning methodology, and also its effectiveness in the covid period was studied.

ERP has become an integral part of all technical educational institutions (TEIs). The author concluded that various plan principles to be incorporated in ERP system for institutions for successful, cooperative learning, electronic learning and collaborative learning [3]. In the paper "Development of an ERP system Design Course to Improve Students Learning Outcomes" the author describes the plan and evaluation system to an ERP scheme of course, to assess learners with experiential learning situations with a free cost learning environment. This paper recommended that the impact of using ERP framework over a large period be a systematic profit in the educational sector [4]. Empirical investigation based on ERP established that the exercise of the simulation game for introducing the ERP concepts can be outleted with an anticipated knowledge and skills in learning, also

while increasing learners' objective for potential commitment in learning [5].

Basic concepts and Definitions

There are several definitions to define ERP and in general, it is a software package to assist with all types of management systems. This management system may be an organization, institutes, schools, educational related organizations etc. Thus ERP is defined as a packed software based system that deals with requirements of enterprise systems in whole fields like finance, human resources, manufacturing, sales and marketing [6]. The main aim of implementing ERP in learning methodology in educational institutions is to increase the ability of learning, research and teaching, at the reasonable cost, but currently it is very useful in this covid situation in order to reduce the workload and for the work appropriateness and effectiveness. These are all possible, since ERP is a software system that practices all required educational based transactions on a unique software on a single database.

Software components of ERP

To implement this ERP in learning methodology, it needs to be streamlined almost in every aspect that are all relevant to the educational setup usage. The major ERP software components that assisted in educational background are human resources, payroll, learner's information, learners accounts receivables, financial aid, travel & expenses and grants etc. Educational institutions can purchase ERP software within the higher education market, some of them are SunGard Higher Education, Oracle, SAP and Datatel. With these some of the ERP softwares that come under education & campus management are pictured below.

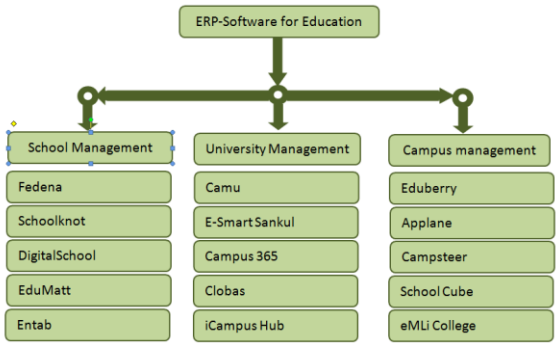

Figure: 1 Some ERP Educational Softwares

ERP based Learning methodology

ERP based learning methodology is a software program that supports an institution to design, accomplish and retain records of all the entire process running within. In the course of this cov situation individuals cannot easily assess manually by anything that is discussed for the educational purpose. And also due to the convenience of internet facility and fulfilling the learners requirements, institutions are favoring on the way to implementing ERP for learning methodology.Also the educational institutions make the learners life educationally wealth and shaping future in this covid period. Each and every step from kindergarten up to higher studies, education plays a critical role in cognitive and academic development of the learners. Educational institutions consider ERP as the best tools for their management practices, implementing academic processes, performing administrative work in utmost efficient manner. Especially from an academic point of view, the educational institutions keep themselves with updated relevancy in all aspects in the view of utilizing modern technology, improvement in terms of knowledge, and especially concentrating in the strategic framework of learner's development. In this cov situation,ERP in education institutions provides entire support that makes the academic year easy, effective and efficient. A school ERP software assists the educationalist to access and perform educational activities in any-time, any-where, as in real time, thus contrasting from traditional exertion loom, especially time-overriding and tedious. The ERP strategy in implementation is a major upgrading of institutions and the implementation strategy describes the plan for change that makes certain arrangements in an accurate relative position with overall educational goals and objectives [4].

Application of ERP based learning methodology

The highlights of ERP in educational setup is its applications. So the applications of ERP in various educational settings will be discussed below.

- Operations management of institutes at a place
- Creating and maintaining module for educational activities
- Modules for administration
- Modules for exams, fee, result, accounting, salary timetables and events.
- Attendance Maintenance for both teachers and learners
- Keeping tracks of student's activities
- Connoting parents through emails/SMS
- Transport maintenance
- Tracking bus locations
- Homework notifications
- Making announcements
- Digitize answer scripts and making them resulting in online
- Speed and efficacy of results process

Implementation of ERP system

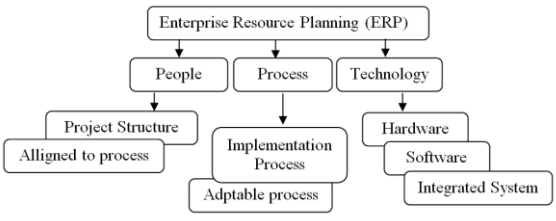

Figure: 2 ERP Model

In the figure , the application of ERP based learning methodology is centered on three major constraints such as people, process and technology. People in terms denoted to administrators, various,

head, principal, teaching faculties and learners. They can be incorporated with project structure and they can be aligned to the ERP based methodology in learning. In the domain of process, it can be implemented and adaptable by the individuals who are all currently engaged in the ERP based learning methodology. And in the final part technology theatres its role in ERP systems and it integrates the whole system in the means of hardware and software aspects.

Sample, Methodological Choices and Methodology

Sample

In this investigation,students, educators, administrators were considered as samples as a totality of 90 in numbers. The samples are just not restricted to any peculiar type of software user and they can be any software user or clients in the above ERP software. This can be left free by the sides of samples in means to collect the multivariate constraints of data. Consequently, a simple random sampling procedure was adopted in this investigation. The samples are contributed from various educational institutions all over India using various ERP software content to explore the current situations and also to recollect the adaptation of ERP methodology at before covid pandemic.

Methodological Choices

For collecting data from the samples in this current investigation, the researcher adopted some methodological choices for data accuracy in the periodical nature. The techniques may be online survey method, qualitative technique and quantitative technique collection of data.

Methodology

Data was collected in a manner that each sample considered with a situation that before and after covid situations. The data were tabulated to find out the effectiveness of ERP in learning methodology during covid period.

Research Questions

(H_1)There exists a significant difference between the project work undertaken in the educational sector assisting with ERP software before and after covid.

(H_2)There exists a significant influence of academic activities on teaching and learning before and after implementing ERP Strategy.

(H_3)There exists a significant difference in the mean scores of learning activities based on ERP content before and after covid.

Methodological Aspects

Background Characteristics Scores of Project work supporting with ERP

Preliminary analysis of the scores was done to capture the nature of the data related to project work based on ERP in the group of administrators, principals, HODs and educators. The objective was to compute the statistical invariables such as Mean, Median, Standard Deviation, Variance and calculate the 't' value of project work using ERP. The statistical aspects are summed up in table 1.

Table 1 - Summary of Mean, Median, Standard Deviation and variance of Pre-Covid and Post-Covid of project work based on ERP

	Group	Assessment	N	Mean	Median	Standard Deviation	Variance	Calculated t' value
Project Work	Administrators Principals HODs	Pre- Covid	30	13.37	13.50	2.85	8.12	0.44@
		Post- Covid	30	27.10	28.00	4.31	18.57	14.13**
	Educators	Pre- Covid	30	13.03	12.50	2.96	8.76	0.44@
		Post- Covid	30	13.47	13.00	3.05	9.30	14.13**

From the table 1, the statistical constants of measures of central tendencies such as mean and median of project work assisting with ERP in the pre-covid is 13.36, 13.50 respectively and the measure of dispersion i.e. standard deviation is 2.85 and variance is 8.12. From the observation of data, it seems that there is not much variation between the values of the measure of central tendencies. The mean and median of project work of post-covid are 27.10, 28.00 respectively and the S.D. is 4.31 and variance is 8.12.

The mean and median of project work of pre-covid for educators are 13.03, 12.50 respectively, the S.D. is 2.96 and the variance is 8.76. Similarly the mean and median of project work of post-covid of the same group are 13.47, 13.00 respectively, the S.D. is 3.05 and the variance is 9.30. Now we can apply the parametric tests for these distributions.

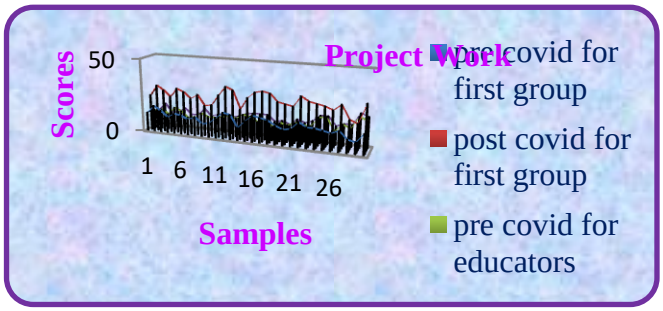

Figure: 3 Graphical Representations of Pre and Post-Covid Scores of Project work

Also the above table explored that the obtained t value of pre-covid scores of the first group and educators group in project work is (0.44), less than the table value and it is not significant at 0.05 level. Also the obtained 't' value (14.13) in post covid scores of the first group and educators group of project work is higher than the table value and it is significant at 0.01 level. It reveals that there exists no significant difference in the mean scores of these two groups in the project work at pre-covid stage. Also it revealed that there exists a significant difference in the mean scores of these two groups in the project work at post-covid stage. Therefore, the stated hypothesis "There exists a significant difference between the project work undertaken in the educational sector that assisting with ERP software before and after covid" is rejected at pre covid stage and accepted at post covid stage. Therefore implementation of ERP based learning methodology is more effective at the period of post covid than pre covid stage.

Influence of academic activities on teaching and learning before and after implementing ERP Strategy.

The objective is to find out the influence of academic activities on teaching and learning before and after implementing ERP Strategy. The data were analyzed and results are charted out in table 2.

Table 2 Data and Results of the Test of Regression Analysis and Significant Influence of academic activities on teaching and learning before and after implementing ERP Strategy.

Model Summary

R		R^2		Adjusted R^2		Standard Error	
Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
-0.1448	-0.4141	0.0209	0.1714	-0.0139	0.1418	2.6894	6.7269

Table 2(a) ANOVA

Model	**Coefficients**		**Standard Error**		t **value**		**Significance**	
	Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
ERP	8.083	38.505	2.396	7.949	3.373	4.843	0.002	4.25E-05
	-0.135	-0.697	0.175	0.289	-0.774	-2.406	0.445	0.0229

Table 2(b) COEFFICIENTS

Model	**Coefficients**		**Standard Error**		t **value**		**Significance**	
	Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
ERP	8.083	38.505	2.396	7.949	3.373	4.843	0.002	4.25E-05
	-0.135	-0.697	0.175	0.289	-0.774	-2.406	0.445	0.0229

The table 2 provides the values of R and R^2. The R value represents the simple correlation and is both -0.1448 and -0.4141, which indicates a high degree of influence. The R^2value indicates the total variation in the teaching and learning. In this case, the increase in the percentage from 2 to 17, this is very large. The coefficients R = -0.1448 and R = -0.4141 indicates that there is a strong influence between teaching and learning, those predicted by the regression model before and after implementing the ERP learning methodology.

The ANOVA table 2(a) reports how well the regression equation influences teaching and learning, before and after implementing the ERP learning methodology. Furthermore, it is indicated that the regression model predicts the teaching and learning as significantly well. This specifies the statistical significance of the influence of academic activities on teaching and learning in the regression model. Here, $p < 0.0005$, which is less than 0.05, and it overall indicates that the regression model statistically significantly predicts the outcome variable. The ANOVA table provides a F test for the null hypothesis that there is no significant influence of

academic activities on teaching and learning, otherwise, that R^2 is zero.

Here, the null hypothesis is clearly rejected, ($F(1,28) = 0.60, p < 0.445$ for before and $F(1,28) = 5.793,\ p < 0.022$ for after), and subsequently conclude that academic activities have significant influence on teaching and learning while concern on before and after implementing the ERP learning methodology.

In the coefficient table 2(b), the output provides estimates of the regression coefficients, standard error of the estimates, t tests that a coefficient takes the value zero, and confidence intervals. The estimated regression coefficients are standardized, so that they measure the change in the dependent variable in units of its standard deviation when the explanatory variable is increased by one standard deviation. This facilitates the comparison of influence across explanatory variables.

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Comparison of the Mean Scores of Learning Activities of Students at Pre & Post-Covid Stage

The objective was to compare the mean scores of Learning Activities of Students at Pre & Post-Covid Stage. Mean, Standard Deviation and calculated t' value is given in table 3

Table 3 Mean Scores of Learning Activities of Students at Pre & Post-Covid Stage

Learning Activities	Pre-Covid			Post-Covid			Calculated t-value
	N	Mean	SD	N	Mean	SD	
Students	30	6.72	1.71	30	8.34	2.56	2.70*

Note: * Significant at 0.01 level

From the statistical value given in table 3, it is observed that the obtained't' value (2.70) is significant at 0.01 level. Therefore, the hypothesis "There exists a significant difference in the mean scores of learning activities based on ERP content before and after covid" is accepted. To sum up, there exists a significant difference in the level of learning activities of the students at pre and post-covid stages. This states that the learning activities undertaken by students that occur on ERP based learning methodology is especially good, and more effective at the pandemic stage than the non-pandemic stage.

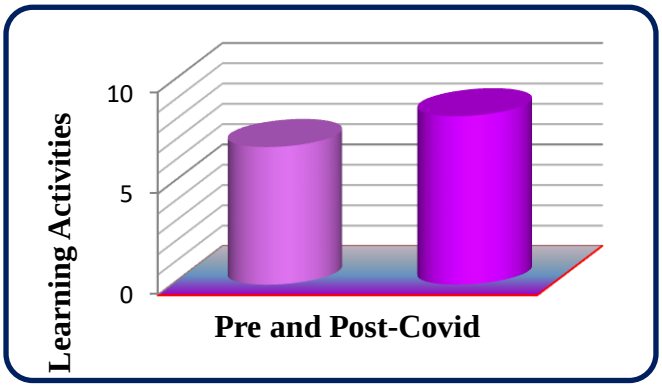

Figure: 4 Comparison of Learning activities of students at Pre and Post-Covid Stage

Suggestions for further Research

As a whole this investigation clearly arrived to a solution that ERP based learning methodology is more effective at the time of covid pandemic. Also the specially designed ERP software for various educational setup also highlighted in this investigation to get an enhanced conceptualization. Through the system, teachers can share the study materials virtually. Documents, e-books,sources,links and videos can be uploaded instantly after the completion of the concept. These kinds of features diminish the miscommunication,since the shared things can be reassessed by the students whenever required. With these process the learning is more effective. After log-in, into the virtual session, attendance can be maintained, classes can be recorded, and it assists the teachers to monitor the students activities, also this setup enhances the discipline rates. Evaluation be also done virtually by the teacher and after the completion of evaluation process the system can automatically generate reports of the students' development. This investigation suggest that, further study can be undertaken with the selection of one or two ERP software for the selected education system, any focus the effectiveness of its implementation and also an attempt can be taken to compare the ERP software in learning methodology.

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