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Competence and Practices of Teacher Educators in Integrating OER: An Economic Perspective

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Abstract

Open Educational Resources (OER) have emerged as an important approach to promoting accessible, affordable and sustainable education by enabling the free use, adaptation, reuse and sharing of educational materials. From an economic perspective, the integration of OER can contribute to the efficient utilization of educational resources and reduce dependence on costly conventional learning materials, which are cost-intensive. In Teacher Education, the effective use of OER can support teacher educators in accessing diverse resources while encouraging resource sharing and cost-conscious pedagogical practices. The present study examines the competence and practices of Teacher Educators in integrating OER from an economic perspective, investigates the influence of selected demographic variables, and determines the relationship between competence and practices. A descriptive survey design was adopted, and a stratified random sampling method was used to select 32 Teacher Educators from various teacher education institutions across Tamil Nadu. The researcher developed and used OER Integration Competence Scale and OER Integration Practices Scale for data collection. The data were analysed using statistical techniques of mean, standard deviation, t-test, ANOVA and correlation. The findings revealed that Teacher Educators exhibited high competence in OER integration, particularly in pedagogical activities, while their actual practices were at an average level, especially in research activities. Pedagogical integration was stronger than research integration. Gender influenced OER integration practices, and the location of the institution influenced OER integration competence. Competence and practices were moderately positively correlated. The study highlights the need for professional development, institutional support, OER repositories, and supportive policies to strengthen OER integration. Effective OER use can promote cost-effective resource utilization, affordability, resource sharing, and sustainable teaching and learning.

Keywords: Open Educational Resources, Pedagogical Activities, Research Activities Competence, Practices, Teacher Educators

1. Introduction

The increasing use of digital technology has changed the way educational resources are created, accessed, and shared. One important development in this context is Open Educational Resources (OER). OER refer to teaching, learning, and research materials that are available for use, adaptation, and redistribution under open licences. UNESCO (2019) describes OER as materials in any format that are either in the public domain or released under an open licence that permits free access, use, adaptation, and redistribution. Textbooks, lecture materials, videos, images, assessment materials, and lesson plans are among the resources that can be made available as OER.

The economic dimension of OER is particularly relevant to education. Educational institutions and learners may need to spend considerable amounts on textbooks, reference materials, and other learning resources. OER provides an alternative by making a wide range of materials freely accessible and allowing them to be reused and adapted. Sharing existing resources can also reduce duplication of effort and support better utilization of available educational resources. Thus, OER has the potential to contribute to affordability, resource efficiency, cost-conscious educational practices, and wider access to learning materials. In teacher education, these possibilities

are relevant because teacher educators can select, modify, and share resources according to the requirements of their courses and learners.

India has taken several initiatives to expand access to digital educational resources with the view to helping the poor students from the disadvantaged segments of society. The National Education Policy (NEP) 2020 emphasizes the appropriate use of technology and digital resources to improve access and quality in education. Initiatives such as the National Repository of Open Educational Resources (NROER), SWAYAM, and e-PG Pathshala provide access to educational content for different groups of learners and educators. These initiatives create opportunities for educational institutions to make greater use of freely available resources and to encourage sharing and reuse.

Teacher Educators are central to the preparation of prospective teachers. Their ability to identify suitable OER, evaluate their relevance, adapt them appropriately, and use them in teaching and research can influence the effective utilization of open resources. However, access to OER alone does not ensure effective integration. Competence in using digital resources, understanding open licences, adapting materials, and incorporating them into educational activities is also necessary. Limitations in technical knowledge, licensing awareness, institutional support, and access to suitable resources may affect the extent to which teacher educators make use of OER.

Tamil Nadu has a well-established teacher education system and increasing opportunities for technology-supported teaching and learning. Nevertheless, there is a need for greater understanding of how teacher educators actually use OER and whether their competence is reflected in their practices. Examining these aspects can provide useful information about the utilization of freely available educational resources and their potential contribution to economical and sustainable practices in teacher education.

Therefore, the present study examines the competence and practices of Teacher Educators in integrating Open Educational Resources from an economic perspective. It also examines the influence of selected demographic variables and the relationship between competence and practices. The findings are expected to provide insights into the potential of OER for affordable access, resource reuse and sharing, and efficient utilization of educational resources in teacher education.

2. Literature Review

Open Educational Resources (OER) are teaching, learning, and research materials that can be free of cost under open licences. UNESCO (2019) highlights OER as an important means of expanding access to knowledge. Wiley and Hilton (2018) further explain that OER can support an open and participatory approach in which educators and learners reuse, adapt, and create educational materials. Thus, OER has implications not only for teaching innovation but also for affordability and efficient use of educational resources.

The economic dimension of OER has been examined in previous studies. Hilton et al. (2014) reported substantial savings for students following the adoption of OER instead of commercial textbooks. Similarly, Hilton (2016), in a review of OER research, found evidence of significant cost savings while learning outcomes were generally comparable to those associated with traditional materials. These findings indicate the potential of OER to reduce the financial burden of educational materials and improve access to learning resources.

In Teacher Education, OER provides opportunities for educators to access, adapt, and share teaching materials according to local and learner needs. Clements and Pawlowski (2012) emphasized the flexibility of OER for adapting educational content, while Mishra (2017) discussed its potential for collaborative learning and professional development. Effective use of OER, however, depends on educators' competence in locating, evaluating, adapting, creating, and sharing open resources. Kimmons (2016) highlighted the importance of technological literacy and understanding of open licensing for effective OER use.

The actual practice of OER integration depends on educators' ability and willingness to incorporate open resources into teaching, learning, and research activities. Previous research has identified benefits such as resource sharing, instructional innovation, and professional learning, while also pointing to challenges related to technical skills, awareness of licensing, infrastructure, and institutional support. These findings suggest that access to OER

alone may not ensure effective integration; adequate competence, institutional support, and opportunities for professional development are also necessary.

Overall, the literature review indicates that OER has both educational and economic significance, particularly through free access, reuse, adaptation, sharing, and potential cost savings. However, limited research has examined the relationship between the competence and practices of Teacher Educators in OER integration, particularly from an economic perspective. The present study addresses this gap by examining Teacher Educators in Tamil Nadu.

3. Significance of the Study

This study is significant in understanding that Teacher Educators can effectively integrate Open Educational Resources (OER) into teaching and research activities while making efficient use of educational resources. OER can provide affordable access to learning materials through free access, reuse, adaptation, and sharing, thereby reducing dependence on costly conventional resources. The findings may help institutions identify the level of competence and actual practices of Teacher Educators and develop appropriate training, institutional support, and OER repositories. The study may also contribute to promoting resource sharing, digital competence, and cost-conscious educational practices. By examining Teacher Educators in Tamil Nadu, the study provides useful insights for developing sustainable and economically efficient approaches to OER integration in teacher education.

4. Objectives of the Study

The objectives of the present study are:

- To find out the Levels of Competence and Practices of the Teacher Educators in integrating Open Educational Resources into Pedagogical and Research Activities.
- To find out the significance of difference, if any in the Competence Levels of the Teacher Educators in integrating Open Educational Resources into Pedagogical and Research Activities, in terms of certain demographic variables.
- To find out the significance of difference, if any in the OER Integration Practices into Pedagogical and Research Activities of the Teacher Educators, in terms of certain demographic variables.
- To find out the nature of relationship, if any between the Competence and Practices of the Teacher Educators in integrating Open Educational Resources.

5. Hypotheses of the Study

In line with the above objectives, the hypotheses formulated, for the present study are as follows:

1. The level of competence of Teacher Educators in OER integration is high.
2. The level of practices among Teacher Educators towards OER integration is high.
3. The level of competence of Teacher Educators in OER integration into pedagogical activities is high.
4. The level of competence of Teacher Educators in OER integration into research activities is high.
5. The level of practices among Teacher Educators towards OER integration into pedagogical activities is high.
6. The level of practices among Teacher Educators towards OER integration into research activities is high.
7. There is no significant difference in the competence of Teacher Educators in OER integration into pedagogical and research activities with respect to the selected demographic variables.
8. There is no significant difference in the OER integration practices of Teacher Educators into pedagogical and research activities with respect to the selected demographic variables.

9. There is no significant relationship between the competence and the practices of Teacher Educators in OER integration.

6. Methodology of the Study

The present study is a descriptive research involving a normative survey. This design was chosen to describe and analyze the competence and practices of teacher educators in integrating Open Educational Resources. The population for the study includes the Teacher Educators working in Teacher Education Institutions in Tamil Nadu. For this study, the researcher selected 32 Teacher Educators using a stratified random sampling technique to ensure representation from different types of institutions. In the present study, the investigator constructed and utilized two tools, that is OER Integration Competence Scale (OER-INCOMS) and OER Integration Practices Scale (OER-INPRAS). The OER-INCOMS is a Likert-type scale that contains 91 items measuring the competence of Teacher Educators in integrating OER. It offers five response options: Fluently to the level of teaching others, Confidently, Possible without anyone's assistance/guidance, Possible with someone's assistance/guidance and Not at all possible. The OER-INPRAS is a Likert-type scale that contains 98 items measuring the practices of Teacher Educators in using OER. It offers five response options: Never, Rarely, Sometimes, Often and Always. Data were collected from the selected teacher educators in person and also through Google Forms to accommodate convenience and accessibility. The collected data were analyzed using descriptive, differential, and inferential statistical techniques.

7. Analysis of Data and Interpretation

The data, collected through the administration of the research tool, when analyzed statistically, has yielded the results, which are presented below with suitable interpretations. The analysis is presented with the hypotheses, followed by data tables and discussions of the results.

A consolidated analysis was performed on the following hypotheses.

H_01. The level of competence of Teacher Educators in OER integration is high.

H_02. The level of practices among Teacher Educators towards OER integration is high.

H_03. The level of competence of Teacher Educators in OER integration into pedagogical activities is high.

H_04. The level of competence of Teacher Educators in OER integration into research activities is high.

H_05. The level of practices among Teacher Educators towards OER integration into pedagogical activities is high.

H_06. The level of practices among Teacher Educators towards OER integration into research activities is high.

Table 1 Mean and Standard Deviation scores of the whole group

Sl. No.	Variables	N	Mean	SD	Level
1	Overall Competence	32	245.31	65.04	High
2	Pedagogical Competence	32	174.63	56.32	High
3	Research Competence	32	70.69	33.09	Average
4	Overall Practices	32	237.31	66.89	Average
5	Pedagogical Practices	32	100.31	30.92	High
6	Research Practices	32	137.00	44.90	Average

Table 1 reveals that, the calculated mean value of OER integration competence scores i.e., 245.31 falls in the High level. Hence, the Hypothesis 1 is accepted and it is concluded that the competence of OER integration among Teacher Educators in Tamil Nadu is high. However, the overall practices (Mean = 237.31) fall within the average level. Hence the hypothesis 2 is rejected and it is concluded that the OER integration practices among Teacher Educators in Tamil Nadu is Average.

The calculated mean scores of pedagogical competence (Mean = 174.63) and pedagogical practices (Mean = 100.31) are both at high levels. Hence, the hypotheses 3 & 5, are accepted and concluded that the level of competence and practices in OER integration into pedagogical activities among Teacher Educators in Tamil Nadu is High. In contrast, the calculated mean scores of research competence (Mean = 70.69) and research practices (Mean = 137.00) are at average levels. Hence, the hypotheses 4 & 6 concluded that the level of competence and practices in OER integration into Research activities among Teacher Educators in Tamil Nadu is Average.

Overall, the findings suggest that teacher educators demonstrate higher OER integration in pedagogical activities than in research activities, reflecting a stronger focus on teaching-related applications of OER.

$H_0$7. There is no significant difference in the competence of Teacher Educators in OER integration into pedagogical and research activities with respect to the selected demographic variables Gender, Age, Designation, Discipline, Type of management and Locality of institution.

Table 2 Group wise mean scores of OER integration competence in pedagogical and research activities of Teacher Educators in terms of age, designation, discipline and type of management.

Sl. No.	Demographic Variable	Statistical Test Used	Source of Variation	Sum of Squares	df	Mean Square	'F' value
1	Age	One-way ANOVA	Between Groups	1110.446	2	555.22	0.14*
			Within Groups	98060.11	26	3771.54	
2	Designation	One-way ANOVA	Between Groups	6633.482	2	3316.74	0.77*
			Within Groups	124515.4	29	4293.63	
3	Discipline	One-way ANOVA	Between Groups	594.456	2	297.22	0.06*
			Within Groups	130554.4	29	4501.877	
4	Type of Management	One-way ANOVA	Between Groups	3079.688	2	1539.844	0.34*
			Within Groups	128069.2	29	4416.179	

*Not Significant

Table 2 reveals that the demographic variables Age, Designation, Discipline, and Type of Management, analyzed using One-way ANOVA, shows F values 0.147, 0.772, 0.066, and 0.349 respectively with corresponding p-values greater than 0.05. This indicates that, there is no significant differences exist among the groups within these factors regarding the measured variable. Therefore, there is no significant difference in the competence of Teacher Educators in OER integration into pedagogical and research activities with respect to age, designation, discipline and type of management.

Table 3 Significance of Difference in the Competence of Teacher Educators in Integrating OER into Pedagogical and Research Activities with respect to Demographic Variables Gender and Locality of Institution

Sl. No	Demographic Variable	Statistical Test Used	Source of Variation	N	Mean	SD	't' value
5	Gender	t-Test	Male	18	262.66	57.34	1.76*
			Female	14	223	69.56	
6	Locality of Institution	t-Test	Urban	19	226.57	62.47	-2.07
			Rural	13	272.69	60.89	

*Not Significant

Table 3 reveals that the mean scores of male was 262.66 (SD=57.34) as compared with that of females i.e., 223 (SD=69.560; the t-value is 1.76, which is not significant. Therefore, the null hypothesis is accepted. It is concluded that, there is no significant difference between male and female Teacher Educators in their competence into pedagogical and research activities.

Conversely, the t-test for Locality of Institution yielded a t-value of -2.07, which is statistically significant at the 0.05 level. This result rejects the null hypothesis and it is concluded that, there is significant difference between Teacher Educators from urban and rural institutions in their competence in OER integration into pedagogical and research activities.

In summary, these results suggest that except for locality of institution, demographic variables such as age, designation, discipline, type of management, and gender do not significantly impact the dependent variable under investigation.

$H_0$8. There is no significant difference in the OER integration practices of teacher educators into pedagogical and research activities with respect to the selected demographic variables.

Table 4 Group wise mean scores of OER integration practices into pedagogical and research activities of Teacher Educators in terms of Age, Designation, Discipline and Type of Management

Sl.No.	Demographic Variable	Statistical Test Used	Source of Variation	Sum of Squares	df	Mean Square	'F' value
1	Age	One-way ANOVA	Between Groups	6113.208	2	3056.604	0.66*
			Within Groups	132589.7	29	4572.057	
2	Designation	One-way ANOVA	Between Groups	3265.881	2	1632.94	0.34*
			Within Groups	135437	29	4670.241	
3	Discipline	One-way ANOVA	Between Groups	5316.304	2	2658.152	0.57*

			Within Groups	133386.6	29	4599.537	
4	Type of Management	One-way ANOVA	Between Groups	9527.521	2	4763.76	1.06*
			Within Groups	129175.4	29	4454.323	

*Not Significant

Table 4 reveals that there is no significant difference in the practices of teacher educators in OER integration into pedagogical and research activities based on age, designation, discipline, or type of management. The F values for these variables 0.66, 0.34, 0.57, and 1.06 respectively, are all well below the threshold for significance at the 0.05 level, indicating that group means do not differ significantly.

Table 5 Significance of Difference in the Practices of Teacher Educators in OER integration into Pedagogical and Research Activities with respect to demographic variables Gender and locality of institution

Sl. No	Demographic Variable	Statistical Test Used	Source of Variation	N	Mean	SD	't' value
5	Gender	t-Test	Male	18	267.05	44.13	3.26
			Female	14	199.07	72.9	
6	Locality of Institution	t-Test	Urban	19	222.21	70.52	-1.58*
			Rural	13	259.38	56.63	

*Not Significant

Table 5 reveals that the difference in practices with respect to gender is marked by a t-value of 3.26, which is statistically significant. Male teacher educators (Mean = 267.05, SD = 44.13) have significantly higher scores than females (Mean = 199.07, SD = 72.9). In contrast, the comparison by locality (Urban vs Rural) yields a t-value of -1.58, which is not significant, indicating no substantial difference in OER integration practices between urban (Mean = 222.21, SD = 70.52) and rural (Mean = 259.38, SD = 56.63) teacher educators. These findings suggest that integration practices for OER among Teacher Educators are influenced by gender, but not by other demographic variables in this context.

$H_0$9. There is no significant relationship between the competence and the practices of Teacher Educators in integrating Open Educational Resources.

Table 5Correlation between OER Competence and Practices of Teacher Educators

Variables	N	r	Interpretation
Competence and Practices	32	0.678	Moderate Positive Correlation

The table 5 reveals that, the calculated correlation coefficient between Competence and Practices of Teacher Educators is 0.678, indicating a moderate positive correlation.
This shows that, the competence of Teacher Educators in OER integration increases, their practices in pedagogical and research activities also tend to improve. Hence, it can be inferred that competence and practices are positively related, meaning that higher competence is associated with better and more effective practices.

8. Findings of the Study

- The overall competence of Teacher Educators in integrating OER was at high level, suggesting that they have good knowledge and skills in integrating OER.
- The overall practices related to OER integration were at an average level, showing that pedagogical and research activities of OER are moderate.
- Pedagogical competence and pedagogical practices were both at high levels, indicating that Teacher Educators are confident in using OER for lesson planning, material preparation, and teaching activities.
- Research competence and research practices were found to be at average levels, showing that OER usage in research, publication, and data analysis is relatively less.
- The demographic variables gender, age, designation, discipline**,** and type of management indicates that no significant differences in the competence of Teacher Educators in integrating OER. However, the locality of the institution showed a significant difference. Teacher educators from rural institutions shows higher competence contrasted to their urban teacher educators. So, it is indicated that except for locality, all other demographic factors do not influence OER competence among Teacher Educators.
- The demographic variables age, designation, discipline**,** locality of institution and type of management suggest no significant differences in OER integration practices. The variable gender showed a significant difference, indicating that male teacher educators have significantly higher OER integration practices compared to female teacher educators. Hence, it can be concluded that gender influences OER integration practices, whereas other demographic factors do not.
- The correlation between OER Competence and Practices of Teacher Educators was found to be moderately positive correlation**.** This indicates that as if the competence of teacher educators' in integrating OER is higher, their practical application of OER in pedagogical and research contexts also improves. Therefore, the null hypothesis "there is no significant relationship between competence and practices" is rejected, showing a significant positive relationship between the two variables.

9. Results, Implications and Suggestions

The present study on "Competence and Practices of Teacher Educators in Integrating Open Educational Resources: An Economic Perspective" provides insights into the competence and practices of Teacher Educators in OER integration. The findings indicate that Teacher Educators demonstrate a high level of competence in integrating OER, while their actual practices are at an average level, particularly in research-related activities. Pedagogical integration was found to be stronger than research integration. These findings suggest that although Teacher Educators possess the competence required to use OER, there is scope for greater and more consistent application of open resources in their academic activities.

From an economic perspective, OER offers the possibility and prospects aspect for the affordable access, reuse, adaptation, sharing, and efficient utilization of educational resources**.** The comparatively lower level of practice in research activities indicates the need to extend the use of OER beyond classroom teaching to literature review, data collection, analysis, and other research-related activities.

Based on the findings, the following implications and suggestions are proposed:

- Organize regular training and professional development programmes on effective OER integration in teaching and research.
- Develop institutional policies and support systems that encourage the reuse, adaptation, and sharing of OER**.**
- Establish institutional or collaborative OER repositories to improve access to quality educational resources.
- Provide specific training on using OER for research activities.
- Encourage collaborative development and sharing of open educational materials among Teacher Educators.
- Conduct periodic reviews of OER usage to improve the quality and effective utilization of resources.

- Create awareness of the economic benefits and resource-saving potential of OER among Teacher Educators and institutions.

10. Conclusion

The study indicates that Teacher Educators possess a high level of competence in OER integration, while their actual practices remain at an average level, particularly in research activities. Strengthening professional development, institutional support, collaborative networks, and access to organized OER repositories can encourage more effective and consistent use of open resources. From an economic perspective, OER offers potential for affordable access, resource reuse, sharing, and efficient utilization of educational materials**.** Strengthening OER integration can therefore contribute to more sustainable and resource-efficient practices in teacher education. The findings highlight the importance of creating an institutional environment that enables Teacher Educators to make effective use of the educational and economic potential of OER.

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