



ENHANCING SOCIAL SCIENCE LEARNING THROUGH E-CONTENT: EVIDENCE FROM A PRE-TEST-POST-TEST EXPERIMENT AMONG IX STANDARD STUDENTS

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Abstract

This study investigates the effectiveness of e-content in enhancing academic achievement in Social Science among IX standard students in Erode District under the Tamil Nadu syllabus. Employing a quasi-experimental design, the research compared the performance of control and experimental groups through pre-test and post-test analysis, focusing on gender (boys/girls) and geographical (rural/urban) distinctions. Pre-test results confirmed the statistical equivalence of both groups. Post-test analysis, however, revealed significant differences favouring the experimental group across all categories. The experimental boys, girls, rural, and urban subgroups consistently outperformed their control counterparts, confirming the positive impact of the e-content intervention. The findings underscore the transformative potential of digital content in school-level social science instruction, affirming its role in bridging educational disparities and enhancing learner performance.

Keywords: *E-content, Social Science Achievement Test, Experimental Group Design, IX Standard Social Science, Quasi-Experimental Design*

1. Introduction

In recent decades, technological advancements have revolutionized various sectors including education. Digital learning environments, multimedia tools, and internet-based learning platforms have become integral components of modern instructional practices. Among these emerging approaches, *e-content* has gained significant importance in school education. E-content refers to digitally developed instructional materials such as educational videos, animations, interactive simulations, and digital presentations designed to facilitate teaching and learning.

In the context of Social Science education, students are often required to deal with abstract themes related to history, geography, economics, citizenship, and social institutions. Traditional teaching methods may not always effectively capture student interest or provide adequate visualisation of complex ideas. E-content, however, makes Social Science lessons more engaging, visual, interactive, and student-centred. Therefore, integrating e-content into classroom teaching



has the potential to enhance students' conceptual understanding, motivation, classroom participation, and ultimately academic achievement.

The present study attempts to examine the effectiveness of e-content on academic achievement in Social Science among IX Standard students in Erode District of Tamil Nadu by comparing the performance of students who learned through e-content with those exposed to traditional teaching methods.

1.1 Statement of the Problem

The present investigation entitled "*Effectiveness of E-Content in Achievement of Social Science among IX Standard Students in Erode District – Tamil Nadu, India*" seeks to analyze whether digitally designed learning materials improve students' academic learning outcomes in Social Science. Although various studies have highlighted the benefits of multimedia-based instruction, limited empirical research has been conducted among secondary school students in Tamil Nadu in the specific domain of Social Science. Hence, this study aims to fill this research gap by evaluating the impact of e-content in comparison with traditional teaching pedagogy.

1.2 Need for the Study

The integration of digital resources has become indispensable in contemporary education, especially in response to the growing demand for technology-supported learning environments. Social Science subjects frequently involve extensive information, conceptual themes, maps, data interpretation, and socio-political understanding. E-content offers a potential solution by presenting information in visually enriched and interactive formats, thereby improving comprehension and retention among learners.

Jonassen (2008) asserted that "interactive e-learning tools can enhance the learning experience, making complex social issues more relatable," suggesting that digital resources support constructive and meaningful learning experiences. Furthermore, Glass (2015) emphasized that "access to knowledge is a fundamental human right, and digital content can help achieve that," indicating that e-content not only improves academic efficiency but also democratizes educational access for diverse learners.

In view of the above, the study becomes necessary to determine whether e-content can actually improve academic achievement among secondary-level Social Science learners in a real-classroom context.



1.3 Scope of the Study

The scope of the present study is limited to investigating the effect of e-content on academic achievement in Social Science among IX Standard students of Erode District in Tamil Nadu. The study specifically focuses on the difference in post-test achievement between students instructed using e-content and those taught through traditional methods. In addition to achievement, the study also seeks to understand student engagement while learning Social Science through digital instructional resources.

1.4 Hypotheses

The study was guided by the following null hypotheses:

- **H₀₁:** There is no significant difference between control group and experimental group boys in their post-test achievement scores.
- **H₀₂:** There is no significant difference between control group and experimental group girls in their post-test achievement scores.
- **H₀₃:** There is no significant difference between control group and experimental group rural students in their post-test achievement scores.
- **H₀₄:** There is no significant difference between control group and experimental group urban students in their post-test achievement scores.

1.5 Limitations of the Study

1. The study was confined to IX Standard students in selected high schools of Erode District, Tamil Nadu.
2. The sample consisted of only 60 students (30 in the control group and 30 in the experimental group), which limits the scope of generalization.
3. The study results may not be generalized to other schools, districts, or states due to contextual variations.
4. The investigation was restricted to only one academic subject (Social Science) and one grade level (IX Standard).

2. Literature Review:

E-Content in Social Science Education

Recent research (2020–2021) indicates that integrating e-content into social science curricula significantly enhances skill acquisition, subject-specific awareness, and inclusive learning, though it requires guided implementation.



1. Development of Essential Skills Multiple studies highlight that e-content fosters competencies beyond basic subject knowledge. **Gonzalez and Martinez (2021)** found that e-content improves digital literacy, enabling students to critically evaluate online information and research with confidence. Similarly, **Flores and Silva (2021)** observed that digital resources promote higher-order thinking, empowering students to analyze complex social issues. **Lewis and Parker (2020)** further emphasized that e-content encourages self-directed behavior, equipping students with lifelong learning and research skills essential for the modern world.

2. Subject-Specific Enhancement and Inclusivity E-content has proven effective across various social science disciplines:

- **Geography:** **Wong and Lee (2021)** reported that e-learning tools, such as interactive maps, significantly boosted global awareness and cultural collaboration among students.
- **Civics:** **Lee (2021)** found that digital resources increased political awareness and active citizenship.
- **History:** **Hart (2021)** demonstrated that interactive media helps close learning gaps and supports diverse needs through differentiated instruction.

3. Student Perceptions and Implementation While students generally view e-content as engaging and interactive, **Wright (2021)** noted that its success depends on effective management. While it allows for self-paced learning, educators must provide guidance to minimize distractions and ensure focused navigation of digital tools.

3. Research Methodology

The present study employed a systematic research methodology in order to assess the effectiveness of e-content in improving academic achievement in Social Science among IX Standard students. The major methodological components of the study are described in the following sections.

3.1 Method Adopted

The study adopted the **Experimental Method**, as this approach enables comparison of learning outcomes resulting from different instructional treatments. Specifically, the experimental method assists researchers in evaluating the causal effect of e-content on students' academic achievement by contrasting the performance of an experimental group with that of a control group exposed to traditional teaching strategies.



3.2 Design of the Study

The research employed a **Pre-Test–Post-Test Control Group Design**, which constitutes one of the most widely used designs in educational experiments. Initially, both groups were administered a pre-test to determine baseline equivalence in their knowledge levels. The experimental group then received instructional intervention using the researcher-developed e-content package, while the control group continued learning through traditional lecture-based teaching supported by textbooks. Following the intervention period, a post-test was conducted with both groups in order to measure learning differences and examine the effectiveness of e-content as compared with conventional pedagogy.

The stages in the design included:

- Development and validation of the e-content package on Social Science
- Traditional mode of teaching for the control group
- E-content-based instruction for the experimental group

3.3 Sample of the Study

The sample of the present investigation consisted of **60 IX Standard students** drawn from Government Higher Secondary School, Lakkapuram, located in Erode District, Tamil Nadu. A total of 30 students were assigned to the experimental group, while the remaining 30 constituted the control group. The sample selection procedure ensured that both groups were comparable in terms of school environment, curriculum exposure and socio-educational background. As Best and Kahn (2010) note, *a sample of this size is sufficient to conduct meaningful statistical comparisons in a quasi-experimental framework*, although subsequent research may expand the sample scope for broader generalization.

3.4 Ethical Clearance Statement

Ethical approval for conducting the investigation was obtained from the Institutional Ethics Committee. Prior informed consent was also secured from the Head of the Institution, students, and parents. Participation was voluntary, confidentiality of data was assured, and students were informed that their academic records would not be affected by their involvement in the study.

3.5 Variables of the Study

- **Independent Variable:** E-Content in Social Science (covering selected components of History and Geography).
- **Dependent Variable:** Academic achievement scores obtained through the researcher-constructed criterion-based achievement test.



- **Demographic Variables:** Gender, locality (rural/urban), and parent's income were considered for subgroup analysis.

3.6 Procedure of the Study

The study was executed in three phases over a period of eight weeks:

Phase I – Pre-test: Both groups were administered a pre-test in order to assess prior knowledge.

Phase II – Intervention: The experimental group underwent e-content-based instruction for 6 weeks, whereas the control group continued to learn through conventional teaching methods.

Phase III – Post-test: At the end of the intervention, a post-test was conducted for both groups to examine achievement differences attributable to the instructional mode.

3.7 Statistical Techniques Used

Both descriptive and inferential statistical techniques were employed for data analysis. Descriptive statistics such as mean, standard deviation, and percentage were computed to summarize performance trends. Inferential statistics involving the independent sample *t-test* were applied to determine whether statistically significant differences existed between the groups and to test the formulated null hypotheses.

4. Data Analysis and Interpretation

The data collected through pre-tests and post-tests were statistically analysed to determine the significance of the difference in academic achievement between the control and experimental groups. Each hypothesis was tested using appropriate statistical methods.

4.1. Testing of Hypothesis

Hypothesis-I

- There is no significant difference between control group and experimental group boys in Post Test

Table-1

Table-1 presents the Level of Significance between Control Group and Experiment Group Boys in Post Test in Achievement in Social Science

Sl. No	Description	C.G. Boys	E.G. Boys
1	N	15	15
2	Mean	27.13333333	32.33333333
3	Median	26	32
4	Mode	25	33
5	SD	2.72204405	3.062834044



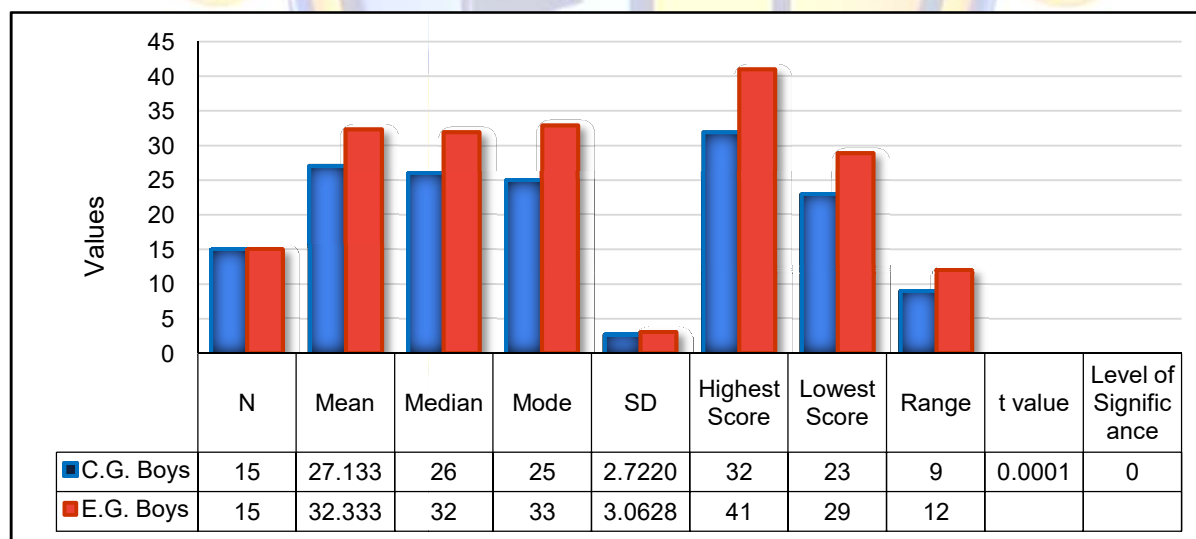
6	Highest Score	32	41
7	Lowest Score	23	29
8	Range	9	12
9	t value	0.000135808	
10	Level of Significance	Significance	

- The mean post-test score of the **Experimental Group Boys (32.33)** is **higher** than that of the Control Group Boys (27.13).
- The **standard deviation** is relatively similar, suggesting comparable variance in both groups.
- The **t-value = 0.000136** is statistically significant at $p < 0.01$ level, indicating a **very strong difference** between groups.

Conclusion: “Null Hypothesis-I is rejected.” E-content had a significant positive effect on boys’ achievement in social science.

Graph-1

Graph-1 present the Level of Significance between Experiment Group and Control Group Boys in Post Test in the Achievement in Social Science



Hypothesis-II

- There is no significant difference between control group and experimental group girls in Post Test



Table-2

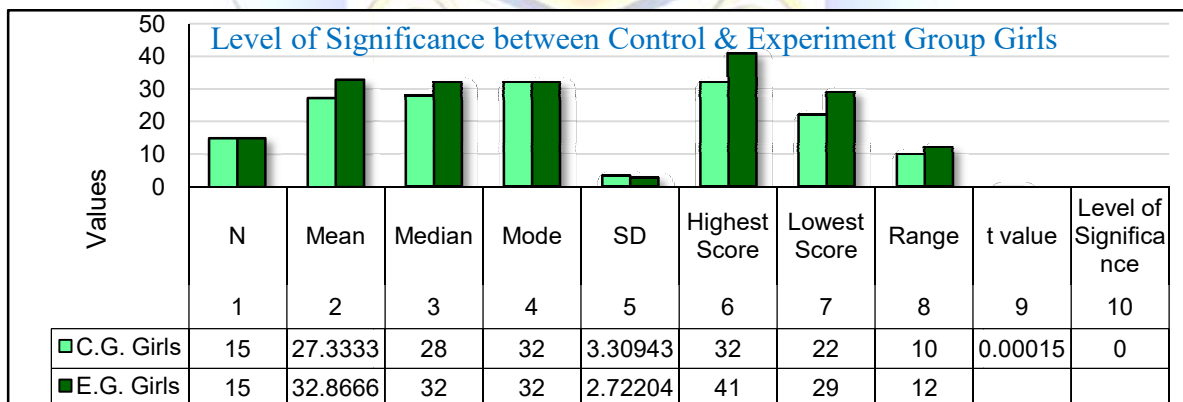
Table-2 presents the Level of Significance between Control Group and Experiment Group Girls in Post Test in Achievement in Social Science

Sl. No	Description	C.G. Girls	E.G. Girls
1	N	15	15
2	Mean	27.33333333	32.86666667
3	Median	28	32
4	Mode	32	32
5	SD	3.309438163	2.72204405
6	Highest Score	32	41
7	Lowest Score	22	29
8	Range	10	12
9	t value	0.000151289	
10	Level of Significance	Significance	

- The **Experimental Group Girls** achieved a higher mean (32.87) than the Control Group Girls (27.33).
- The relatively lower SD in the experimental group shows **more consistency** in performance.
- The **t-value = 0.000151** is statistically significant ($p < 0.01$).

Conclusion: “Null Hypothesis-II is rejected.” E-content positively impacted the academic achievement of girls in social science.

Graph- 2 : presents the Level of Significance between Control Group and Experiment Group Girls in Post Test in Achievement in Social Science





Hypothesis-III

- There is no significant difference between Control group and Experiment group Rural students and their Post Test Scores

Table-3

Table-3 presents the Level of difference between the Experiment Group and Control Group Rural Students in Post Test in the Achievement in Social Science

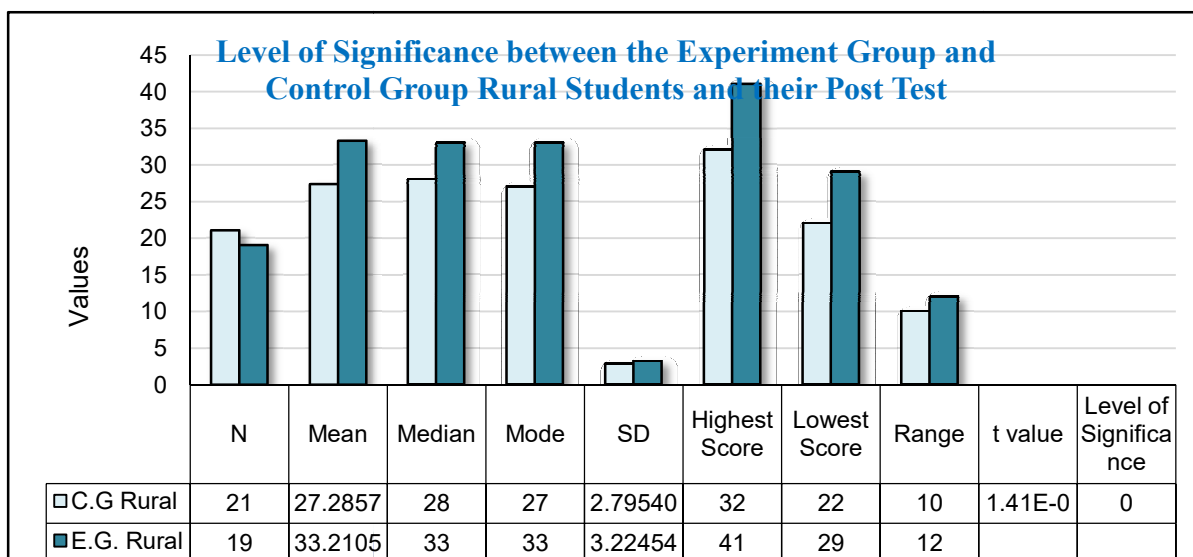
Sl.No	Description	C.G Rural	E.G. Rural
1	N	21	19
2	Mean	27.28571429	33.21052632
3	Median	28	33
4	Mode	27	33
5	SD	2.795404392	3.224540404
6	Highest Score	32	41
7	Lowest Score	22	29
8	Range	10	12
9	t value	1.41019E-07	
10	Level of Significance	Significance	

- Rural students in the **Experimental Group** scored significantly higher (Mean = 33.21) than those in the Control Group (Mean = 27.29).
- The **t-value = 0.00000014** is **extremely significant** ($p < 0.01$), indicating a highly reliable difference.

Conclusion: “Null Hypothesis-III is rejected.” E-content is highly effective in improving rural students’ academic achievement in social science.



Graph-3: Shows the Level of difference between the Experiment Group and Control Group Rural Students in Post Test in the Achievement in Social Science



Hypothesis -IV

- There is no significant difference between Control group and Experiment group Urban students and their Post Test Scores

Table-4

Table-4 presents the level of Significance between the Experiment Group and Control Group Urban Students and their Post Test in the Achievement of Social Science

Sl.No	Description	C.G Urban	E.G. Urban
1	N	9	11
2	Mean	27.11111111	31.54545455
3	Median	26	32
4	Mode	25	32
5	SD	3.551212625	1.752919642
6	Highest Score	32	35
7	Lowest Score	23	29
8	Range	9	6
9	t value	0.000967246	
10	Level of Significance	Significance	

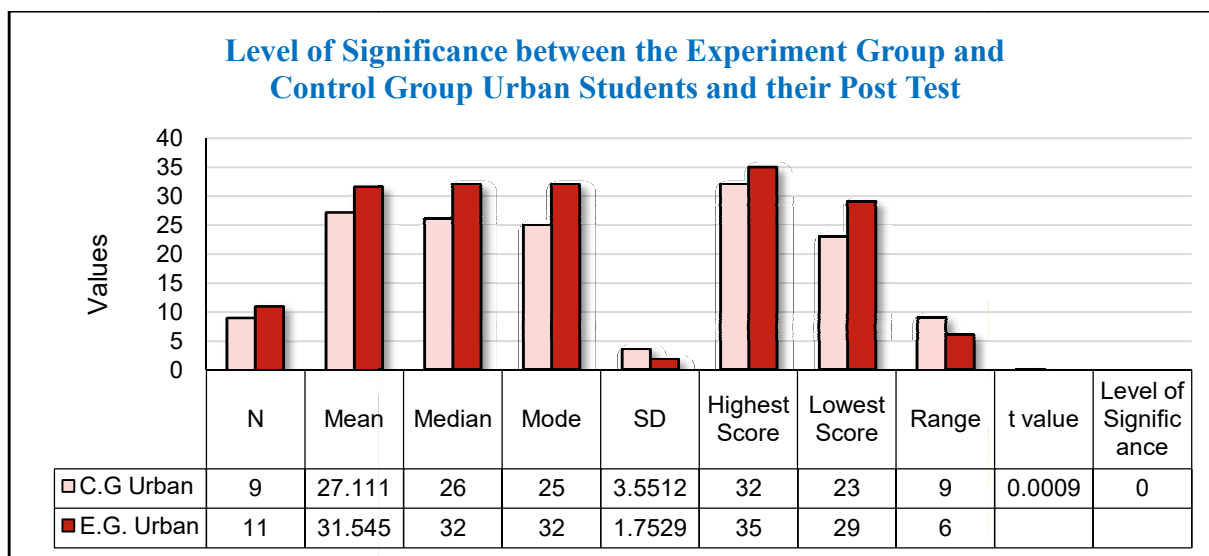
- Urban students in the **Experimental Group** scored higher (Mean = 31.55) than the Control Group (Mean = 27.11).



- The SD is lower in the experimental group, indicating greater consistency in scores.
- The t-value = 0.000967 is statistically significant ($p < 0.01$).

Conclusion: “Null Hypothesis-IV is rejected.” E-content significantly enhanced the achievement of urban students in social science.

Graph-4 Shows the Significance between the Experiment Group and Control Group Urban Students and their Post Test in the Achievement of Social Science



The obtained t-value is statistically significant, the “Null hypothesis-VI is rejected.” There is a significant difference between the Experiment Group and Control Group Urban Students and their Post Test.

5. Findings:

1. The Experimental Group (E.G.) Boys significantly outperformed the Control Group (C.G.) Boys, with higher central tendencies, greater score ranges, and a statistically significant t-value confirming the intervention's effectiveness.
2. The Experimental Group Girls outperformed Control Group Girls across almost all metrics (mean, median, and highest score). The results are statistically significant, as indicated by the low p-value (derived from the t-value). This implies that the observed differences are unlikely to have occurred by chance.
3. The Experiment Group Rural students outperformed the Control Group Rural Students, showing better overall performance and a wider range of achievement. The statistically significant difference highlights the effectiveness of the intervention in the Experiment Group Rural Students



4. The Experiment Group Urban students demonstrated better overall performance than the Control Group Urban Students, with higher central tendencies and more consistent scores. The statistically significant difference confirms the effectiveness of the experimental intervention in the Experiment Group Urban students.
5. Finally, All results are statistically significant, confirming that **e-content instruction** had a **positive and consistent impact** on student's academic achievement across gender and locality.

5.1 Discussion

The findings clearly show that e-content significantly improved students' achievement in Social Science across gender and locality. The experimental group consistently outperformed the control group, supporting Clark and Mayer's (2016) conclusion that multimedia enhances learning effectiveness.

The improvement among rural students suggests e-content can help bridge educational gaps, aligning with Jonassen's (2008) view that digital tools make abstract topics more relatable. Lower score variability in the experimental group also indicates greater consistency in learning outcomes.

Despite these promising results, limitations exist. The small sample size ($N = 60$), short intervention period, and single-school setting may affect generalizability. Future studies should include larger, diverse samples and explore long-term impacts of e-content on learning.

6. Conclusion

This study confirms that e-content significantly enhances academic performance in social science among IX standard students. Students taught with digital content outperformed their peers across gender and geographic groups. The results validate e-content as an effective instructional tool and support its integration into the school curriculum to promote equitable and improved learning outcomes.

References:

- Best, J. W., & Kahn, J. V. (2010). *Research in education* (10th ed., pp. 175–203). Pearson Education.
- Clark, R. C., & Mayer, R. E. (2016). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (4th ed., pp. 85–96). Wiley.



- Flores, M., & Silva, R. (2021). The role of e-content in fostering higher-order thinking skills within social science education. *International Journal of Social Science Education Research*, 15(2), 112–124.
- Garrett, H. E. (2005). *Statistics in psychology and education* (pp. 230–248). Paragon International Publishers.
- Gonzalez, R., & Martinez, S. (2021). Integration of digital literacy into social science curricula using e-content. *Journal of Digital and Social Studies*, 9(3), 87–101.
- Hart, P. (2021). Addressing learning gaps in history education through e-content. *History Education Review*, 28(1), 55–68.
- Jonassen, D. H. (2008). *Meaningful learning with technology* (3rd ed.). Pearson Education.
- Lee, J. W. (2021). The role of e-content in enhancing civic education and its impact on student political awareness. *Journal of Civic and Citizenship Studies*, 6(2), 74–89.
- Lewis, J., & Parker, R. (2020). Developing lifelong learning skills through e-content in social science. *International Review of Educational Technology*, 14(4), 233–247.
- Mangal, S. K. (2007). *Statistics in psychology and education* (pp. 112–129). PHI Learning Pvt. Ltd.
- Wong, S., & Lee, T. (2021). Promoting global awareness through e-learning in geography. *Journal of Geography and E-Learning*, 19(3), 142–158.
- Wright, J. (2021). Student perceptions of e-content used in history classrooms. *Journal of History and Digital Pedagogy*, 5(1), 20–35.