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Construction And Standardization Of An Attitude Scale Towards E- Resources Among XI Standard Students

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Abstract: The present study aims to develop and standardize a tool to assess the attitude towards E-Resources among XI standard students studying in higher secondary schools. A 55 item likert- type attitude scale was constructed based on an extensive review of related literature, existing tools and consultation with experts in Education, Education Technology, Psychology and ICT. The tool adopts a five-point response format ranging from strongly Agree to strongly Disagree. The reliability of the scale was determined through a pilot study has done with 50 students and internal consistency was assessed using Cronbach's Alpha. A total no of items 55, from these 43 items were retained for the final study. The internal consistency or reliability of this scale is 0.898. The present research discussed to development of the scale to measure the level of attitude towards E-Resources among XI standard students.

Key words: Attitude, E-Resources, ICT in Education, Higher secondary students, Digital learning.

Introduction

The educational environment has radically changed, Due to the fast adoption of the Information and Communication Technology (ICT), especially in the school level, where the technology has acted as a catalyst to new teaching and learning techniques (Bharti, R 2024). In a world that is characterized by the digital revolution, the provision and adoption of e-resources such as e-books, online educational videos, interactive applications, virtual simulations and extensive digital libraries has come in with an unprecedented increase in educational institutions (Maadu, S., & Krishnamurthy, 2025). These resources do not only democratize access to quality learning resources but also to dynamic, multimedia rich experiences that cannot be limited by printed textbooks and dead lectures. E- Resources are more eco- friendly than printed materials because they reduce pollution and require minimal energy for storage and maintenance. Since they cannot be physically discarded and most people have access to digital devices, e-resource support sustainable and eco-friendly learning (Shenmare,2018). The various technology platforms such as BYJU's and DIKSHA, which have supported millions of learners in understanding conceptual materials at their own speed, by enabling critical thinking, problem- solving and teamwork abilities, which are core competencies of the 21st century (Suresh Kumar, V. 2023).

The digital proliferation is particularly relevant to the background of secondary education where XI standard students, who are usually aged 16-17, at a critical juncture between school – based curricula and professional and academic career development. The e-resources adoption in India has become a national requirement in the country; the policy on ICT in Education and NEP 2020 specifically highlight blended learning and development of digital infrastructure, considering that there are more than 1.5 million schools in

India and a student population of over 250 million (Vats, S. 2024). Nevertheless, even with such improvements in infrastructures as PM e- VIDYA and SWAYAM portals, e-learning ecosystem will still depend on the attitude of users.

Therefore, e-resources attitudes employ a significant indirect or direct influence on academic performance of students and this impacts the participation, retention and mastery of digital learning tools. Hence, the attitude of students toward e-resources should be measures and known in a systematic manner. Using this study, the researchers have constructed and validated Attitudes toward E-Resources Inventory to be used specifically with XI standard students using well- established psychometric techniques of Likert- scale item development, exploratory factor analysis and reliability test to ensure reliability and validity to Indian higher secondary setting.

Review of Related Literature

AyuWidyaNingsih et al. (2022) conducted a study on exploring high school students' perception towards the use of ICT in EFL learning. To achieve the objective, 44 students at eleventh grade majoring in language and Culture Science. The data obtained was analyzed by employing the descriptive analysis technique using questionnaire distributed to students in the form of Google Form. The results showed that the students 'perception was positive and high in each perception aspects in the questionnaire given. Alfiya R. Masalimova et al. (2024) the aim of this research was to explore the attitudes of higher education students toward e-learning. Data collection was conducted via a questionnaire. The findings demonstrated that the key benefit of e- learning, as reported by a substantial majority of participants, is the convenience of studying from home. The results showed that e- learning was perceived to be less effective compared to conventional face- to-face learning. Also, we showed that, in general, there is no significant relationship between socio-demographic variables and attitudes toward e-learning. Sanchez, Alina et al. (2023) this article examined to determine the attitudes of undergraduate nursing students toward e-learning at the. A quantitative, non-experimental, descriptive and exploratory approach was the procedural methodology selected in this study. The result shows students who have previous computer training were significantly more confident in connection to the internet than those with no prior computer training. Students who had prior experience in e-learning predicted they would feel significantly more nervous when working with computers than those who did not have this prior experience.

Objectives of the Study

- To construct and standardize the attitude scale of E-Resources scale (AERS).
- To examine the internal consistency of the attitude towards E- Resources scale.
- To construct a valid and reliable Attitude towards E-Resources.

Methodology

The attitude scale towards E- Resources was developed and standardized by the investigator and research supervisor to assess the student's attitude towards E-Resources. Likert method was followed to construct and validation the attitude scale. The response categories are Agree, Strongly Agree, Neutral, Disagree, and StronglyDisagree. Each statement requires the respondent choose the response category that most closely corresponds to his or her genuine feelings.

Construction of the Attitude towards E-Resources Scale

According to Likert (1932), attitudes can be effectively measured using a five point scale captures varying degrees of agreement with a given statement. In the present study, an Attitude towards E-Resources Scale was developed to measure the attitude of XI standard students towards the use of e-resources in learning. Initially, an extensive review of related literature, existing attitude scales and theoretical frameworks on educational technology and digital learning was undertaken. Based on this review and consultations with experts in education and educational technology, a pool of 55 statements was generated. The scale was designed in a Likert format with appropriate response categories, enabling respondents to indicate the extent of their agreement with each statement.

Pilot Study

To examine the clarity, relevance and effectiveness of the items, a pilot study was conducted. The preliminary version of the Attitude towards E-Resources Scale was administered to a sample of 50 XI standard students drawn from KENC Government Higher Secondary School, Manavalanagar; DRBCCC Hindu Higher Secondary School, Thiruvallur and Shree Niketan Matriculation Higher Secondary School, Thiruvallur, all located in Thiruvallur District. The selection of diverse school types ensured adequate representation of varying learning environments and technological exposure. The responses obtained from the pilot study were subjected to item analysis to assess the quality and performance of each item.

Item Analysis

Item analysis was carried out to determine the suitability of the statements included in the scale. The internal consistency of the scale was established using Cronbach's Alpha reliability coefficient. Based on the item total correlation values and reliability statistics, items were screened and refined. The results of item analysis revealed that items 10,18,19,23,24,25,26,28,30,31,35,37 and 51 showed comparatively low correlations with the overall scale score. The item total correlation values for these items were 0.191, 0.115, 0.168, 0.054, 0.155, 0.159, 0.139, 0.181, 0.197, 0.145, 0.091 and 0.177, respectively. In contrast, all remaining items in the scale demonstrated item total correlation values of 0.2 or higher, indicating satisfactory discrimination power. Further examination of the inter-item correlation matrix confirmed that the same set of items (10,18,19,23,24,25,26,28,30,31,35,37, and 51) consistently exhibited significantly lower correlations when compared to the rest of the items in the scale. This finding suggests that these items were less homogeneous with the overall construct being measured.

In addition, analysis of Cronbach's Alpha if Item Deleted indicated that the overall reliability coefficient of the scale would increase to 0.898 if any of these 13 items were removed. This increase in reliability provided strong statistical justification for excluding these items from these final versions of the scale. Based on the combined evidence from item total correlations, inter-item correlations and Cronbach's Alpha analysis, the identified thirteen items were eliminated. Consequently, the final form of the Attitude towards E-Resources Scale demonstrated improved internal consistency and enhanced measurement precision, making it suitable for use in the main study.

The criteria adopted for item selection were as follows:

- Items with correlation values above 0.30 were considered good and retained.
- Items with correlation values between 0.20 and 0.30 were considered workable.
- Items with correlation values below 0.20 were considered not acceptable and eliminated.

On the basis of item analysis and reliability results, 13 items were discarded and the final version of the scale consisted of 42 items. The retained items demonstrated satisfactory internal consistency and were considered suitable for measuring the attitude towards E-Resources among higher secondary students.

Table 1: Item-Total Statistics

Question Numbers	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Remarks
Q1	197.32	508.059	.423	.885	Selected
Q2	197.00	504.898	.451	.885	Selected
Q3	198.00	504.449	.377	.885	Selected
Q4	197.78	507.440	.252	.887	Selected
Q5	198.26	495.747	.362	.885	Selected
Q6	197.74	493.788	.483	.884	Selected
Q7	197.60	497.918	.446	.884	Selected
Q8	197.42	506.779	.314	.886	Selected
Q9	197.62	498.444	.467	.884	Selected
Q10	153.14	422.409	.191	.898	Not Selected
Q11	197.86	503.592	.310	.886	Selected
Q12	197.92	496.932	.508	.884	Selected
Q13	197.58	504.167	.391	.885	Selected
Q14	198.18	490.028	.456	.884	Selected
Q15	197.88	506.353	.288	.886	Selected
Q16	197.68	502.508	.462	.884	Selected
Q17	197.48	507.724	.248	.887	Selected
Q18	197.60	514.735	.115	.888	Not Selected
Q19	197.96	513.998	.156	.888	Not Selected
Q20	197.80	506.490	.348	.886	Selected
Q21	198.70	497.357	.446	.884	Selected
Q22	197.84	491.117	.486	.883	Selected
Q23	197.62	513.302	.168	.887	Not Selected
Q24	197.50	518.704	.054	.888	Not Selected
Q25	197.92	511.259	.155	.888	Not Selected
Q26	197.48	512.540	.159	.888	Not Selected
Q27	197.72	503.144	.388	.885	Selected
Q28	198.46	513.560	.139	.888	Not Selected
Q29	197.82	500.232	.382	.885	Selected
Q30	198.28	510.981	.181	.888	Not Selected
Q31	197.70	507.888	.197	.888	Not Selected
Q32	197.60	498.245	.439	.884	Selected
Q33	197.70	500.582	.389	.885	Selected
Q34	197.54	503.070	.369	.885	Selected
Q35	197.76	511.900	.145	.888	Not Selected
Q36	197.94	509.037	.260	.886	Selected
Q37	197.20	516.204	.091	.888	Not Selected
Q38	197.94	499.078	.470	.884	Selected
Q39	197.96	497.590	.448	.884	Selected
Q40	197.90	505.357	.303	.886	Selected
Q41	198.08	498.483	.329	.886	Selected

Q42	197.74	505.176	.325	.886	Selected
Q43	197.68	494.059	.506	.883	Selected
Q44	197.82	504.069	.283	.886	Selected
Q45	197.70	499.847	.371	.885	Selected
Q46	197.82	500.232	.376	.885	Selected
Q47	197.88	502.393	.345	.885	Selected
Q48	197.58	507.473	.276	.886	Selected
Q49	198.16	500.341	.369	.885	Selected
Q50	197.60	490.245	.548	.883	Selected
Q51	197.28	514.042	.177	.887	Not Selected
Q52	197.68	508.263	.324	.886	Selected
Q53	197.38	500.853	.433	.884	Selected
Q54	197.86	501.674	.395	.885	Selected
Q55	197.74	482.074	.573	.882	Selected

Final Form of the Tool

The finalized Attitude 5toqards E-Resources Scale comprises 42 items and is intended to assess the overall attitude of XI standard students towards the use of e-resources in learning. The tool is suitable for use in secondary school settings and can serve as a standardized instrument for educational research related to digital learning and technology integration.

Scoring Procedure

Scoring was based on a five point Likert type scale. The points are usually denoted by 5 for Strongly Agree (SA), 4 for Agree (A), 3 for Neutral (N), 2 for Disagree (D) and 1 or Strongly Disagree (SD) the maximum score of the scale could be 210 and minimum score of the scale could be 42.

Reliability and Validity

Reliability refers to the degree of consistency in measurement, meaning that an instrument yields stable and dependable results over repeated applications (Paul Spector, 1997). In the present study, the internal consistency reliability of the attitude towards E-Resources Scale was established using Cronbach's Alpha, which yielded coefficient values of 0.898. This value indicates a high level of reliability.

Further, the square root of the reliability coefficient, representing the validity of coefficient of the scale, was found to be 0.947, indicating very high validity if the assessment tool. Hence, the Attitude towards E-Resources Scale is considered to be both reliable and valid for measuring student's attitudes.

The criteria adopted for interpreting reliability coefficients were as follows:

Above 0.70-Acceptable

Above 0.80-Good

Above 0.90-Excellent

Based on these criteria, the reliability of the scale falls within the 'Good' category, confirming its suitability for research purposes.

Conclusion

The present investigation culminated in the systematic development and standardization of an Attitude towards E-Resources Scale designed for XI standard students. Employing rigorous methodological procedures including comprehensive item generation, pilot administration and robust statistical scrutiny the initial pool of 55 items was empirically refined to 42 statements exhibiting strong discriminative power and conceptual coherence. The final version of the scale demonstrated high internal consistency reliability, as evidenced by a Cronbach's Alpha coefficient of 0.898 and established satisfactory validity, affirming its measurement precision and construct integrity. The elimination of weak items based on item total correlations, inter-item relationships and reliability diagnostics significantly enhanced the overall quality of the instrument. This standardized scale

constitutes a valuable contribution to the domain of educational technology research by offering a dependable tool for assessing student's attitudes towards E-Resources. It holds substantial potential for application in large-scale educational studies, programme evaluation and policy-oriented research aimed at optimizing digital resource integration in secondary education. The instrument also provides a strong empirical foundation for future investigations exploring the relationships between learners' attitudes, digital competence and academic engagement.

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