TuijinJishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 44 No. 5 (2023)

E-Content in Enhancing Creativity among Prospective Teachers

[1]S. JANAKI, [2]Dr. N. DEVAKI

[1]Research Scholar, Department of Education, Gandhigram Rural Institute-Deemed to be University, Gandhigram, Tamil Nadu, India-624302
[2]Assistant Professor, Department of Education, Gandhigram Rural Institute-Deemed to be University, Gandhigram, Tamil Nadu, India-624302.

Abstract

Electronic content is becoming more and more popular in today's educational system since it works well for students and helps teachers who employ tailored instruction techniques. According to the Consortium for Educational Communication, achieving specific educational objectives is the primary goal of creating e-content. In light of this, the researchers set out to create e-content on a chosen topic related to creativity. Higher-Order Thinking Skills (HOTS) must be practiced in order to be creative in the advancement of both teaching and learning. Among the HOTS, creativity is one that must be incorporated constantly and daily. It is that crucial. The e-content that the investigators created incorporates a variety of aspects, including objectives, audio, videos, text, AI films, animations, illustrations, text with pictures, assignments, quizzes, tutorials, and references. The major purpose of the study was to assess the influence of the E-Content module intervention on prospective teachers' creativity. For both the pre- and post-tests, we used a single group design. We selected 48 aspiring teachers from the Department of Education, GRI - DTBU, Gandhigram, Dindigul, using a simple random sampling technique. Data was collected using research tools such as the E-Content Module and a performance-based evaluation exam. A performance-based evaluation exam was utilized to assess effectiveness both before and after the intervention with the e-content module. The study's findings revealed that using e-content in the classroom improves student achievement for aspiring teachers. Thus, educators should use electronic information to spark the interest of potential instructors in learning.

Keywords--- *e-Content, Education, Development of e-Content, Validation of e-Content, Creativity, Prospective Teachers.*

Introduction

In light of the complexity of today's social, political, and economic situations, an online content lesson is typically designed to assist students in navigating a range of information or completing certain objectives. In today's virtual classroom, an electronic content module bundle can be employed as a teacher. The utilization of technology information can help to improve the effectiveness of education. E-content allows for personalized learning. Given the complexities of modern situations, such as the rapid growth of the social, economic, and demographic sectors, this type of content is frequently generated and arranged to empower students by transferring knowledge and allowing them to do the required work. The teacher can use electronic content in the virtual classroom to expedite individual learning and save money, time, and effort for the teacher. Text, photos, animation, music, video, and graphics are all possible components of electronic content. It can also be seen offline or on web pages that can be simply transferred from one machine to another.

Using the e-content technique in the classroom can help students learn more effectively and advance (Mishra et al, 2005). Felix (2007) did research on the generation and verification of electronic content in biotechnology related to recombinant DNA technology. Electronic content outperforms printed materials as a teaching tool (Farookue, 2008; Dilek, 2010; Tekin and Polat, 2016). Techniques appropriate for teaching mathematics can foster mathematical thinking by providing an atmosphere that supports it (Jaleel, 2015). It was determined how well an e-content package taught undergraduate students the IUPAC nomenclature of organic chemistry. Student achievement will increase and cognitive overload related to learning through e-content multimedia elements will be greatly reduced if the cognitive theory of multimedia learning is appropriately applied in the educational process under the same conditions as this study (Hamdi&Hamtini, 2016). The

outcomes showed that the experimental group's mean scores differed significantly from those of the control group (Devendrian, 2017).

E-content modules, according to Albana (2018), are a valuable instrument for teaching mathematics education to B.Ed. students. Chemistry Massive Open Online Course (MOOC) e-content module development was a better option for instruction, with study findings indicating that e-content modules had higher validity and reliability, and students thought they were an excellent and helpful online resource for higher education institutions (Hamid, Lee, et al., 2021). The implementation of electronic content in educational institutions has the ability to overcome a number of intrinsic hurdles in the teaching and learning process, such as pedagogical issues, time and space constraints, and other issues (Nachimuthu, 2012).

According to research findings, students with better surfing habits learned more from the e-content intervention than students with no browsing habits (Kannan and Muthumanickam, 2010). This digital content includes text, music, video, photographs, animation, and visual effects and can be viewed online, via satellite transmission, or via mobile devices. E-content is designed with students in mind. Collaboration between academics and technologists is required for e-content or knowledge packaging. As a result, educators must be skilled at developing e-content that supports learning while taking into account the specific needs of each student. It must also be able to function in synchronous mode if the instructor is unavailable.

E-content engages students more deeply and motivates them to learn through the use of music, text, animation, motion images, and other elements that successfully appeal to their senses. E-content learning relies heavily on student interaction. When creating resources and activities, consideration is given to the requirements and interests of the students. Students can participate in interactive learning through the use of e-content. E-content is available anywhere, at any time. E-content is accessible at all times and from any location. Special education students can also benefit from the curriculum. Additionally, it offers a reliable and efficient training environment. Many research, including those by Felix (2007), Nivetha(2008), Dilek (2010), Amutha (2016), and Albina (2018), have been done on e-content. E-content has been shown to be an excellent teaching and learning medium, according to the review. Numerous research were carried out both domestically and internationally, but there wasn't enough material in the literature that was especially concerned with the creation, approval, and manipulation of e-content. Thus, researchers made the decision to create and verify the E-content in creativity. The researchers made the decision to create E-content, which consists of text, audio, and video, with the goal of providing an effective teaching approach at the B.Ed. level. They also decided to further analyze the effectiveness of the material.

The Study's Objectives

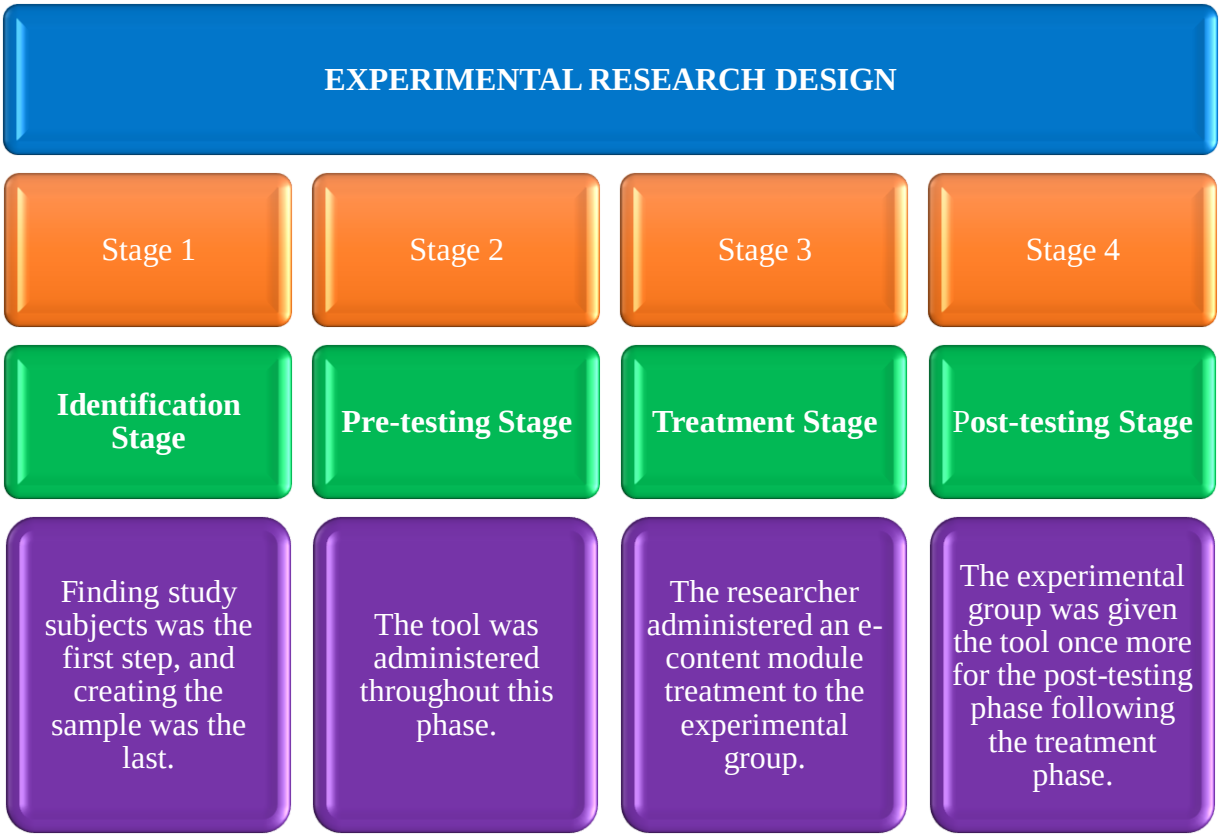
1. To develop the E-Content on Creativity.
2. To ascertain the effectiveness of the E-Content on Creativity.

The Study's Hypothesis

There is no statistically significant difference in Prospective Teachers' pre-test and post-test scores.

Population and Sample

Population includes all the Prospective teachers in Dindigul district and The study's sample size was 48 prospective teachers from the Department of Education at GRI-DTBU in Gandhigram, Dindigul. The study was experimental in nature, and the researcher employed an experimental research design with a single set of participants. There was only one group in the experimental group. A single group pre-post experimental design was used for this study. The experimental group was given an e-content module on creativity. Before the experiment, the students were given a Performance Based Assessment test to assess their understanding. Students were given an electronic content module after the pre-test knowledge assessment, and after two weeks of the module intervention, prospective teachers were given another Performance Based Assessment test.



Sampling Methodology

The sample was chosen using a simple random sampling process.

Data Analysis for Statistics

Inferential and Differential data analysis carried out to test the hypothesis of the Study.

Phases of E-Content Development

- **Analysis Phase**
  - ***Unit Selection:***To generate e-content, researchers chose the topic of "Creativity."
  - ***Content Analysis:***Content analysis aids in the identification of all terms, definitions, points of information, instruments, illustrations, formulas, diagrams, and graphic aids that are pertinent to the content.
  - ***Entry Behavior:***Learners' demands, conceptual and cognitive levels, learning styles, and terminology should all be considered before creating any e-content.
  - ***Determination of Objectives:*** After selecting and analyzing an acceptable topic, learning objectives can be defined while taking into account the learner group's past knowledge and other competencies.
  - ***Evaluation Measures Development:*** The investigator built a tool since a pre-test is required to assess the students' performance before to the e-content intervention.

- **Designing Phase:**When creating a modular framework, investigators decide on the goals of each module, its title, and the best arrangement of presenting techniques.
  - ***Creating Frames:*** Criterion, Teaching, and Testing Frames were the three categories of frames created. This is a knowledge test for the student. As a result, during pretests, the pupils received a tool. All of the topic-related information is included in the teaching frames, together with assessment questions and audio and video support. After finishing the e-content, the student is given a performance-based assessment exam.

- ***Screen Preparation in Relation to Actual Programming:*** The e-content was prepared using a variety of technologies. These included text, animation, sound, graphics and colour, timing, and video.

- **Programming Phase:** E-content preparation is almost complete once the final screen layout is complete. The e-content presentation technology was employed in its execution.

Validation of E-Content

- ***Expert Opinion:*** In order to validate the E-Content, researchers conferred with educators and subject matter experts.
- ***Individual Try Out:*** Students in the target group received the e-content following expert validation. This may be accomplished by figuring out which terms and ideas were irrelevant and eliminating them.
- ***Pilot Testing:***In pilot testing e-Content was tested with Forty Students.

Writing the E-Content Module Script

The investigator conferred with professionals before writing the e-content script. The e-content for creativity was developed using the script as a foundation. Experts were given scripts so they could confirm the content's Validity.

Construction of Tools

Tools are used to evaluate an individual's degree of competency. The degree of competence of a person can be ascertained through a performance-based assessment test. We will look at the efficacy of e-content in this study. Researchers created a test instrument based on Bloom's Taxonomy to evaluate the efficacy of created E-Content.

Validation of the Tool

Theimportant stage in the Tool's development is validation. In order to validate the Performance-Based Assessment tset that the investigators designed, content validity was employed.

- ***Phase 1 - Rough Draft Preparation:***The investigators created the gadget.
- ***Phase 2 - Expert Validation:*** Following the tool's construction, researchers verified its face validity and content validity. In order to get their suggestions, the tool's draft is distributed to subject matter experts. Experts made several adjustments to the tool; some questions were added, some were removed, and some new elements were changed as a result of their recommendations.
- ***Phase 3 - Try Out:*** After making the required adjustments, researchers contacted a few potential teachers and gave them the tool to test with the kids. Investigators made clarifications to the unclear queries.
- ***Phase 4 - Pilot Testing:*** After developing the tool, the researchers tested it on 40 prospective teachers, and the results showed that the instrument was well-received.
- ***Phase 5 - Tools Finalization:*** The tool was completed following expert validation and pilot testing. and prepared for the Prospective Teachers' administration.

Assessing the E-Content Module's Effectiveness

48 prospective teachers were chosen in order to assess the efficacy of the e-content. Prior to testing Prospective Teachers were subjected to a post-test experimental design.

- ***Phase I:***With the approval of the B.Ed. course instructor, this phase started with the students' pre-tests.
- ***Phase II:***The student participated in the E-Content intervention after the pretest was administered by the investigator.
- ***Phase III:***The post-test was given out following the conclusion of the instructional treatment (E-Content).

Data Analysis

(1) Quantitate Analysis

Table 1: The Experimental Group's Mean Scores and Level of Significance

Experimental Group	*Mean*	*S.D*	*t value*	*Result*
Pre-test	31.74	3.17	3.5456 *	**Hypothesis is rejected (5%)**
Post-test	33.18	2.94		

The Table 1 shows that, the mean value and SD values of the Pre and Post test scores of Experimental Group. They are 31.74, 33.18 and 3.17, 2.94 respectively. The calculated t-value is 3.5456, which is significant and hence the formulated hypothesis "There is no significant difference between the Pre and Post test scores of Experimental Group" is rejected.

(2) Qualitative Analysis

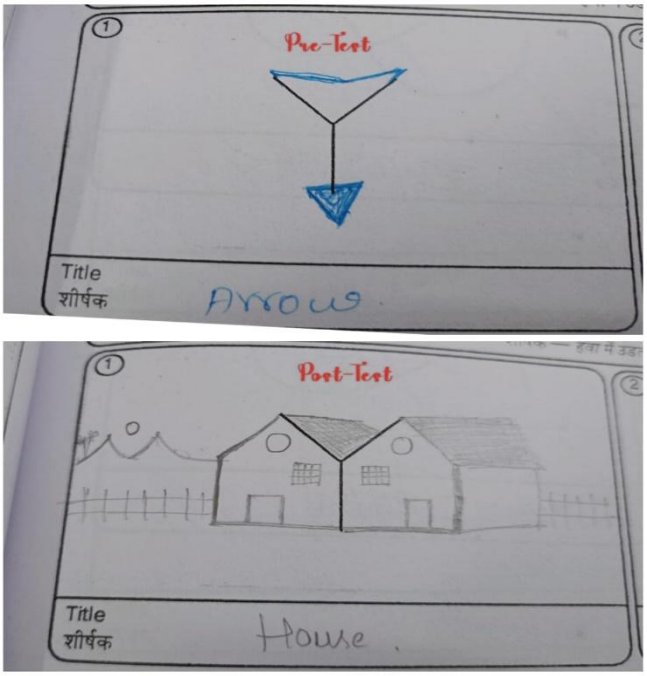


Figure 1: One Sample's Pre and Post Performance Based Assessment Test

Figure 1 reveals that, Performance-based assessment scores increased by the E-content intervention in the post-test compared to the pre-test.

Results and Discussion

The experimental group's pre- and post-test results revealed that the t value was 3.5456 at the 0.05 level of significance. At the 0.01 significance level, this exceeds the 2.98 table value. The difference in maximum scores on the performance-based evaluation tests between the experimental groups mean scores is thus significant at the 0.05 level of confidence.

The findings of the study agreed with those of Tekin, A., and Polat, E. Electronic material increases students' academic achievement, according to Prabakaran and Saravanakumar (2020), Nivetha, V. (2008), KannanandMuthumanickam (2010), and Prabakaran (2016). It is distinct from Smith, S. B. et al. (2000), Schnitman, I. (2007), and Hareton, K.N. Leung (2003). The mean score for the post-test is 33.18, which is greater than the mean score for the pretest (31.74), according to the table 1. It suggests that the e-content intervention has a positive effect on the performance of prospective instructors. The course materials can be

digitized and made available online using a Content Management System (CMS) so that researchers, professors, and students can use them whenever and wherever they want (Sinha and Sahay, 2017).

The pupils are the center of attention in an e-content system. Student requirements and interests are taken into account while developing materials and activities. Interactive content can be found on computers. The learner can access online materials at any time. It also provides reliable and effective training. Students are encouraged to actively participate in the teaching and learning process when they use e-content, a self-instructional learning tool. E-content learning is regarded to be more favorable and successful (Khan, 2019). Some teachers have noticed that employing e-content for more time to be spent on discussion, inquiry, and problem-solving strategies. It is an effective method of conveying content (Joshi, 2017). They gain immensely from e-content because it allows them to post queries in the course discussion boards. According to studies, students who used digital learning were more driven to learn. Furthermore, it significantly improved academic outcomes (Lin, E.T AL., 2017). Interactive, web-based simulation is the primary source of the increase in students' achievement levels (Dilek, 2010).

Research Results

Researchers determined the following based on their analysis of the study's findings:

- There was a statistically significant difference between the prospective teachers' pre- and post-test performance-based assessment test outcomes after the E-Content intervention. It implies that there was a change in the prospective teachers' performance-based assessment test pre- and post-test scores.
- Performance-based assessment scores increased following the E-content intervention in the post-test compared to the pre-test.

Educational Consequences of the Investigation

- The experiment's findings revealed that e-content had a considerable impact on performance on performance-based evaluations. The study's findings demonstrated how effective electronic content is as a teaching tool.
- The use of e-content is changing education in a variety of ways. E-content allows teachers to create their own content.
- E-content learning encourages critical and proactive thinking. When educators and learners use e-content resources, their roles shift from fact-givers to learning environment facilitators.
- E-content is beneficial to both instructors and students, regardless of the platform used for instruction. More computer simulation applications that include animation, flash flicks, sound effects, text, and videos entice learners. As students' interest in them grows, learning becomes more effective, and they become more interested in them.
- By giving teachers and students with access to created e-content, educational institutions can enrich and improve the teaching and learning process. E-content is an excellent learning resource. This is a resource that we can utilize whenever we want.
- E-content may substantially benefit the scientific discovery process, and creative use of these technologies can help student instructors understand the range of alternatives accessible in science education training. To make scientific knowledge learning more interesting, e-content and its application should be pushed.
- Why The utilization of e-content will enrich the classroom atmosphere by decreasing the weight of the curriculum.

Conclusion

Undoubtedly, e-content holds the key to the teaching-learning process. On the other hand, creating e-content is a challenging endeavour that necessitates profound expertise in the subject matter, meticulous selection of the content, perseverance throughout the creation process, resourcefulness in integrating interactive elements, meticulous arrangement of the content, and comprehensive analysis of the material to be delivered to

students. Research suggests that individuals have a tendency to retain just 20% of auditory information, while their ability to remember visual stimuli increases to about 50%. Everything that is seen, heard, and done by them. In the realm of e-content, interactive elements such as audios, videos, texts, and animations thrive.

Students have the option to utilize all components of the module for enhanced and enduring learning, or they can opt for specific elements that captivate their interest.

Recommendations

While other researchers typically utilize two groups, control and experimental, this study deviated by employing only a singlegroup pre and postexperimental design. The research applicable to both university and college students can be employed in creating e-content for various subjects in schools. The evaluation of the module's effectiveness can be done with or without teacher assistance. Investigating the attitudes of instructors and students towards utilizing e-content for education and learning is viable. There is a possibility of conducting research to ascertain the advantages of e-content in both synchronous and asynchronous modes.

References

[1] Abid Haleem, Mohd Javaid, Mohd Asim Qadri, Rajiv Suman, 2022. Understanding the role of digital technologies in education: A review, Sustainable Operations and Computers, 3, 275-285. ISSN 2666-4127.

[2] Albina, A.P. (2018). Effectiveness of E-content in Teaching of Mathematics Education among B.Ed. Student-teachers. American Journal of Educational Research, 6(7), 1021-1028.

[3] Balachandran,P., &Saravanakumar, A.,R., (2018).Objectives of e-content. development. Curriculum and Instructional Designing for Global Education (GLIDE - 2018).Alagappa University- Karaikudi.

[4] Begum, A. J. (2007). ICT in Teaching Learning. Aph Publishing Corporatio.Deivam, M. (2016). ICT literacy among B. Ed. teacher trainees. International Journal of Multidisciplinary Education and Research, 1(3), 05-08.

[5] Castro, R. (2019). Blended learning in higher education: Trends and capabilities. Education and Information Technologies, 24(4), 2523-2546.

[6] Devaki, N. (2015). Construction of e-content: A challenge for the knowledge creativity on the digital highway. International Journal of Applied Research 2015; 1 (13): 779, 783.

[7] Devendiran, G., and Vakkil, M. (2017).Effectiveness of E-Content Package on Teaching IUPAC Nomenclature of Organic Chemistry at Undergraduate Level. i-manager's Journal of EducationalTechnology,14(3),49-54.

[8] Farookue, U.(2008).Development and Validation of e-Content on Process of Communication in B.Ed. curriculum,Unpublished M.Ed. dissertation, Bharathidasan University, Tiruchirappalli.

[9] Hamdi, M., and Hamtini, T., (2016). Designing an Effective e-Content Development Framework for the Enhancement of Learning Programming. International Journal of Emerging Technologies in Learning (iJET). 11(4).

[10] Hareton K.N. Leung (2003) Evaluating the Effectiveness of e-Learning, Computer Science Education, 13:2,123136.

[11] Henriksen, D., Henderson, M., Creely, E., Ceretkova, S., Černochová, M., Sendova, E., ...& Tienken, C. H. (2018). Creativity and technology in education: An international perspective. Technology, Knowledge and Learning, 23, 409-424.

[12] Henriksen, D., Mishra, P., & Fisser, P. (2016). Infusing creativity and technology in 21st century education: A systemic view for change. Journal of Educational Technology & Society, 19(3), 27-37.

[13] Jahitha Begum, A., Sathishkumar, A., & Rahman, T. H. (2021). Executive Functioning Skill, Neurocognition, and Academic Achievement of UG Students. Neuro-Systemic Applications in Learning, 27-46.

[14] Jaleel, S. (2015). Effectiveness of e-content in mathematics on mathematical thinking among secondary school students. International journal of recent scientific research 6(11) 7315-7318.

[15] Jerslin, S., & Devaki, N. (2016). Creativity: A new dimension in blooms taxonomy. International Journal of Advanced Education and Research, 1(4), 65-68.

[16] Joshi, B., D., (2017).E-content development: prospects and challenges.Ijariie 2 (1), 2395-4396.
[17] Kahneman, D. (2011) Thinking, Fast and Slow, London, Penguin.Kannan, B. and Muthumanickam.A., (2010) Development and Validation of e-content Package on 'p-Block Elements for XI Standard Students, Unpublished PhD thesis, MaduraiKamarajUniversity.
[18] Kapilas, P., & SREEDEVI, P. (2022). E-Content As An Innovative Teaching Tool For Improving Science Process Skill At Secondary Level. Journal of Positive School Psychology, 6(8), 3302-3306.
[19] Karahoka, D. et.al (2010) Interactive e-content development for vocational and technical education. Procedia - Social and Behavioral Sciences, 2, 5842-5849
[20] Khan, S., H., (2019).Effectiveness of E-content in Enhancing the Academic Performance of Student Teachers of Biological Sciences: An Empirical Approach. International Journal of Social Science and Humanities 7(3),(129-134),
[21] Lin, ET. AL (2017).A Study of the Effects of Digital Learning on Learning Motivation and Learning Outcome. EURASIA Journal of Mathematics Science and Technology Education, 13(7).
[22] Mishra, U., Patel, S. and Doshi, K. (2005). E- Content: An Effective Tool for Teaching and Learning in a Contemporary Education System. IJARIIE 2(1) 79-83.
[23] Nachimuthu, K. (2012). Need of e-content developments in education. Education Today. An International Journal of Education & Humanities, 3(2), 72-80.
[24] Nivetha, V. (2008), Development and Validation of e-Content on the Universe in Physics at Higher Secondary Level.Unpublished M.Ed. dissertation, Bharathidasan University, Tiruchirappalli.
[25] Paul, R. and Elder, L. (2004) 'The miniature guide to critical thinking: concepts and tools', Foundation for Critical Thinking.
[26] Perry, A. and Karpova, E. (2017) 'Efficacy of teaching creative thinking Skill: A comparison of multiple creativity assessments', Thinking Skill and Creativity.
[27] Perumal, R. B. V., & Vinothkumar, K. (2022). The Uses of Web 2.0 Technologies in Teaching and Learning. Emerging Trends of ICT in Teaching and Learning, 86.
[28] Ponnusamy, P. (2019). Creativity of Student-Teachers with Reference to Their Gender and Locality. Shanlax International Journal of Education, 8(1), 48-53.
[29] Schnitman, I. (2007). The dynamics involved in Web-based learning environment (WLE) interface design and human-computer interactions (HCI): Connections with learning performance (Doctoral Dissertation). West Virginia University, Morgantown.
[30] Shiratuddin, N., Hassan, S., and Landoni, M. (2003). A Usability Study for Promoting e-Content in Higher Education. Educational Technology and Society, 6 (4), 112-124.
[31] Sinha, B., &Shanker, S., (2017). E-content: an effective tool for blended learning. International Journal of Scientific & Engineering Research 8(1).
[32] Smith et.al (2000) Increasing Access to Teacher Preparation: The Effectiveness of Traditional Instructional Methods in an Online Learning Environment.Journal of Special Education Technology. 15(2) 37-46.
[33] Sreedevi, P. S., &Kapilas, P. (2022). Impact of Effective E-content Modules for Improving Science Process Skill. Emerging Trends of ICT in Teaching and Learning, 266.
[34] Sreedevi, P. S., & Nandini, M. P. (2022). Techno Creativity: An Innovative Digital Skill for learning. Emerging Trends of ICT in Teaching and Learning, 277.
[35] Tekin, A., and Polat, E. (2016). A Scale for E-Content Preparation Skills: Development, Validity and Reliability. Eurasian Journal of Educational Research, 62, 143-160.
[36] Tharmar, K.,andKalidasan, R., (2019).Design and development of e-content modules and it's outcome among national eligibility test aspirants in physical education subject. Infokara research 8 (7).