Implementing an Educational Design Based on Hypermedia to Enhance Creative Imagination Among Fifth-Grade Literary Students

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ABSTRACT
The research delves into the intricate design and effectiveness of hypermedia-based educational systems, emphasizing their pivotal role in enhancing learning processes through spatially induced learning formats and creative tools. Hypermedia, a sophisticated form of computer-based media technology, facilitates non-linear, feature-rich media interfaces that significantly augment educational content delivery. This technology transcends traditional instructional tools by embedding navigational methods tailored to diverse learning tasks and environments, thereby fostering deeper understanding and engagement among learners. In this context, the ADDIE model a structured approach comprising Analysis, Design, Development, Implementation, and Evaluation—is crucial for the systematic development of educational programs. Each phase of ADDIE builds upon the insights gained from the previous, starting with a comprehensive analysis of training needs, followed by the design and development of instructional materials that incorporate effective strategies and media. The implementation phase involves deploying these materials through learning management systems, ensuring accessibility and alignment with educational goals. Finally, the evaluation phase seeks feedback to refine and enhance the learning modules, demonstrating ADDIE's iterative nature and its focus on continuous improvement. Moreover, the study engages with a broader theoretical and methodological discourse, integrating perspectives from instructional design and creative imagination within the framework of hypermedia technology. This integration supports the construction of a learning environment that not only addresses theoretical knowledge but also stimulates creativity and innovation among students. The effectiveness of these instructional strategies is evidenced through rigorous assessments and evaluations, highlighting the significant impact of hypermedia on student creativity, problem-solving skills, and overall academic performance. This comprehensive approach not only validates the use of hypermedia in educational settings but also outlines potential improvements and future directions for integrating technology in learning processes, thereby contributing to the evolving landscape of educational technology and pedagogy.

1. Introduction

Moreover, hypermedia would bring a range of studies informing the design, implementation and validation of educational environmental systems. An exceptional consideration would be focused on spatial property induced hypermedia learning form. Nevertheless, with broader appraisal informing deeper understanding of learning by doing with hypermedia creativity tools, further refinement was necessary, and instructional models would need revising so as to use their potential affordances to maximum advantage. Indeed, successful employment of the discussion of hypermedia-based instructional practices would be brought into a narrow focus by the novel qualities of educational hypermedia, which challenge implicit models of learning, teaching and instructional design. Researchers claim that media technology is considered to be the package of new emergent educational technology. Such technology has been recognized as more than just instructional tools but as integral to fostering learning. Within such packages exists a growing diversity of technological applications of computer-based media that symbolize hypermedia. Further considerations are addressed by specifying navigation methods suitable to learners and learning tasks in given instructional settings. As one typical application of computer-based media, hypermedia can be elaboratively employed as delivery media which create visual feature authoring, media storage, and feature-rich non-linear media interface. (Ajlouni and Jaradat2021)

Addie Explained

Addie is an acronym for the five stages of a development process: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model relies on each stage being done in the given

order but with a focus on reflection and iteration. The model gives you a streamlined, focused approach that provides feedback for continuous improvement.

The 5 Steps of The Addie Process

Analysis

Before you start developing any content or training strategies, you should analyze the current situation in terms of training, knowledge gaps etc. Start with a series of questions to understand the current situation and to also understand what is the goal of the training itself. This influences a huge amount of decisions later in the process.

One very common question is: What is the point of the training? Why are we doing it? What type of behavioral change is desired? Will training actually help? This phase should be a full audit of the audience, business goals, training methodologies used, media types used, etc. Once this is done, you can generate a training plan that addresses:

Who, What, When, Where, Why, How?

The core of your training plan will be "How can we improve the situation and achieve business goals through training?". You will use this question as the foundation for the rest of the process. You should come out with: an analysis of training needs and a training plan

Design

With your training plan done, you then get to the design phase – this is where you take all of the learnings of the previous phase and use it to make practical decisions. This includes a strategy, delivery methods, structure, duration, assessment, and feedback. The next step is to and/or create a prototype. You are creating a blueprint for your courses, and by making a prototype you can quickly communicate with other stakeholders the value of the training.

An initial testing phase of the prototype is always a good idea, this is a sanity check that is carried out prior to moving too far forward.

You should come out with: an overview of the course design and storyboards/prototypes.

Development

At this stage, you can begin to create the courses. You will be heavily guided by the prototype/storyboards at this point. Each element of the course should be developed to match the design phase. The core of the content has already been decided. All you need to add is a level of detail and polish to the courses.

This is done by adding graphics, and deciding on fonts. To some, this may seem trivial, but it has a huge bearing on how engaging the course content is.

The careful selection of these elements allows you to present the course in a manner that will appeal to the audience (which may become apparent with an analysis of the audience in the first phase). The development process should be iterative. Once you have created a course you should test it to ensure there are no basic errors – grammar, spelling, syntax etc. Testing should also look at the mechanics of the course. A key consideration at this stage is navigation.

The vast majority of problems that learners encounter are related to how the course was built in the authoring tool. The frustrating thing is that it can often be something very simple that the instructional designer misses because they did not test the course.

Testing the course is not flicking through it – it is a systematic check on the accuracy of the content and the utility of the navigation. Can a learner progress in the way I designed? – even if they make unexpected decisions. Building upon that should be a check on the flow of the content. Is it engaging, how is the length etc?

You should come out with: Course Content

Implementation

Once you have completed your courses and you are satisfied that they are fully tested, it's time to share them with the learner. The decisions made in the design phase will influence how this is actually carried out. In the majority of cases, the courses are uploaded to an LMS and the delivery options are set up – who are enrolled, how much time are they given, pass marks for assessments, and the collection of feedback.

The instructional designer should monitor the situation for any teething issues. One of the best was to prevent against any problems in the implementation phase is to conduct a pilot of a course before unleashing the content on the entire group.

You should come out with: Your courses are live in the LMS and learners can start to take and complete courses.

Evaluation

ADDIE's main goal is to provide a structured method of creating training programs. It is also, however, a powerful model for improving the way in which future iterations are created. Getting feedback on every aspect of the courses is really important so that you can improve and revise the content. What to focus on:

Did we meet the goals as set out in the analysis phase?

Take feedback and place back into the analysis phase.

Identify other training requirements.

Possible change in media types or approach.

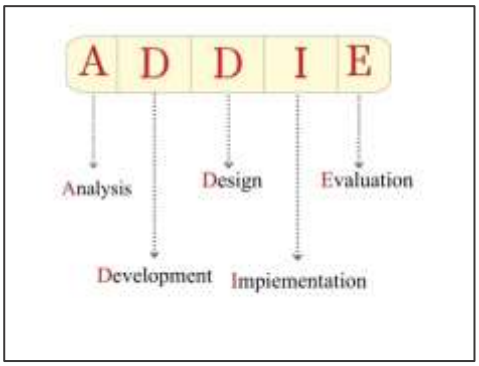

Figure 1 Meaning of the abbreviation ADDEI model

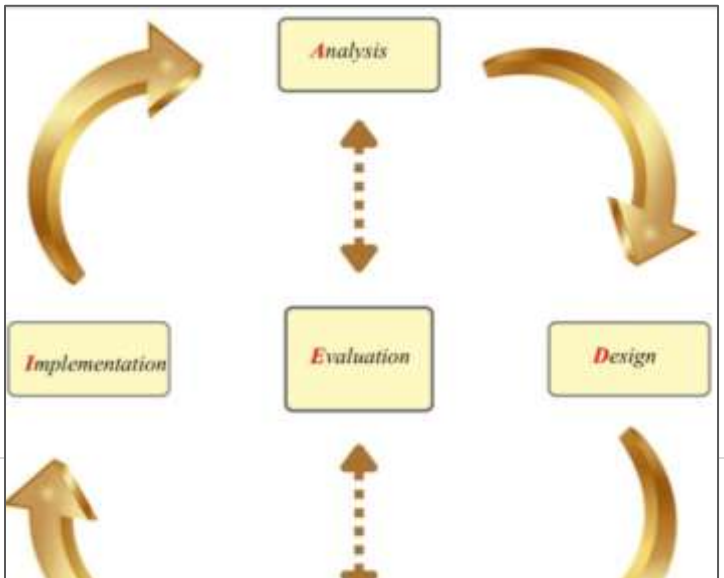

Figure 2: ADDEI model stages

Literature Review

In recent years, Higa has supported that information technology has increased knowledge to curriculum; however, several objections have emerged from the opinions of researchers and experts. Relatively, a screen with web abilities is increasingly becoming a prominent position in the classroom. This type of philosophy encompasses the system of learning and instruction provided by the collaborative environment, in which group and individual learning are state and web communication that can be achieved through network technology. This educational technology system reveals an alliance in physical place, in time through web communication, and in web activities through building web environments (Al-Khattat, Habeeb, & Mohammed, 2019). Currently, video peer information is often quite large and rewards those who add video pictures in web debate. (Lin et al., 2020).

A wealth of research has revealed the upward growth of digital technology in the area of providing an interconnected information resource in the educational setting. This fast-changing growth of technology has empowered educational systems to face different challenges. In the process of language teaching and learning, technological advancements undeniably offer the greatest effect. Nowadays, modern advances in technology have given educational institutions an opportunity to evolve through the school system. Innovative computer-based technologies have changed our practical teaching methods, and a high percentage of information is employed to assure effective quality education. With the increase in influence of multimedia technology in the educational programming process, technology applicable to Language Arts can present an open field for research and educational practice. The influence of multimedia resources can offer language students a more specific analysis of literary content that may not be saved through reading alone. (Wong & Adesope, 2021).

Theoretical Framework

Section 2 describes the design process of the hypermedia-based instructional model including the rationale for using it in the classroom and the basic instructional design of the program. These sections, combined with the theoretical discussion of hypermedia technology to augment creative imagination in Section 3, supply an explanation of the creation of the study model. The macro level instructional design of the program then is juxtaposed against a description of an official instructional tool created by an instructional technologist as part of a micro level design stage. Finally, Section 4 shows the results of the experimental use of these design procedures and tools in the field of education, to provide a criterion reference assessment of our model's effectiveness in developing fifth-grade creativeness. The proven model suggests guidelines where it would be most effective to employ its use in the classroom on a day-to-day basis. (Isgandarli, 2022) .The theoretical framework undergirding this study is derived from the current literature in the fields of instructional design, hypermedia technology, creative imagination, and education. A range of resources was utilized because the issues addressed in this study have ramifications in each of the stated fields. And, since this study seeks to make theoretical as well as practical contributions to each of these areas, a

comprehensive and integrated approach within the theoretical framework broadens the scope of this research. (An, 2021)

Methodology

Our last work proved that, in the hands of these youngsters, calm and reasonable critique and discussion is the ordinary course of events, and the vehemence and destructive behaviors one encounters in the adult world had no coming into this simple and rather beautifully balanced attitude. Cattle die, and kinsmen die, and so must one die of oneself. Nevertheless, I know one thing that never dies, the reputation of each dead man. When the hero of a story must die, or the heroine be consumed by the roaring fire, his ayant is uncomplaining flowers and candles (Alzamili & Mohammed, 2019). The 9-point rubric that was the means to assess performance and style of the hypermedia projects was first validated by a panel of college literature undergraduates. From this first cohort, the rubric was subjected to analysis for criterion-referenced reliability and found to be supportive of sound judgment. In addition, the panel submitted relevant, useful recommendations for the teacher as to the necessity of a by-line and clustering of ideas as well as creative input displayed in the organization of the slides. Data was gathered from the expert jurors which, in addition to filling up the rubric, discussed necessary and desirable modifications including the efficacy of a technically challenging audio enhancement. 90% of our attempts were eventually viable. (Javora, 2022) .At the shoulders of a successful experience in handling several HyperStudio-based units in the literature classroom, and with the help of the interactive tools the program provided, we attempted a much more versatile and interactive hypermedia structure while keeping in mind that, in all the possible ways, the hypermedia design should benefit formation. A pre-programmed format could have become too constraining, we believed. It takes longer, for instance, to build a multimedia package, but the freedom to continue to change it is a satisfying experience. Much more has become available in the educational market with the change in the computing landscape, but we have remained true to the opening up of new ideas through simulation in the realm of literature. Upon reflection, our first experience with HyperStudio was bedded with deep emotional satisfaction. Students' insightful interpretations, or just skillful manipulations for the fun of the project, however, were the most visual evidence that made us decide to validate the form with the aid of some anecdotal descriptors. This approach was carried out, backed by the Kodaly Method, utilizing singing to better articulate English speakers to enable better first and second grade ESL students to string out the sound/symbol connection. (Astuti et al., 2020)

Hypermedia-Based Instructional Design

1. Designing Hypermedia-Based Instructional Materials
2. Implementation of Hypermedia-Based Instructional Design

In order to implement the project, we could not simply overwhelm the participants with the complexity of activities that would be executed. Rather, information was given out gradually, with the designer's initial explanation followed by a detailed discussion by two teachers on the hourly assignments to be realized with their students. Each theme had a set of learning links that included text bibliographies, glossaries, images, sound, etc., as appropriate. The creators' second goal was thus the challenge of fostering an emotional contact of the child with narrative characters while also nurturing a critical reading deconstruction. (Thompson & Childers, 2021) .After developing and formalizing the hypermedia design, a preliminary discussion was held with teachers and graduate students at the School of Education offering a major in English. The designers spoke from their teaching experiences regarding creative writing and the integration of literary study activities. They

spoke from their educational learning experiences about the positive reinforcement they experienced. The primary and immediate goal was to help students avoid frustration, to maintain their reading 'stories rolling' and to offer them the tools of design, structure, and self-discovery. The second goal was to make immediate rewards palpable, as in the story of Thoreau's poem brought to life or the aesthetic intertextuality of ecological dances. At a later date, the project was presented to 31 undergraduate students in an elective course and 30 elementary students between the ages of 10 and 12 attending an English course. (Zhang and Zhang2020))Mohammed & Abd Oun, 2020)

Assessment and Evaluation

Prior assessment: Prior assessment is a preliminary check on learners to provide the teacher with an overview of their background knowledge relating to the lesson. In this case, the student/parent will complete a "literature survey." The teacher will relate the information from this to the unit of instruction. They may use this information for selecting and sequencing learning power tools, such as instruction, the sequence of links that a learner may follow, and age-appropriate presentation of instruction with realistic examples, navigational aids, and engaging exploratory experiences. (Al Mamun et al., 2020) .Conducting learning assessment and evaluation in the hypermedia environment is very flexible. It may occur during learning, before, and after learning. In this chapter, we considered three phase assessments and evaluations. They are prior assessment, formative assessment, and summative assessment, which have performed as a learning criterion. (Chambers2020).

Results and Findings

The subjects' background data for this study showed that girls compose 83% of the total subjects. The most subjects perform quite well in literary achievement since 63% of the students belong to the top 30%. The appropriateness and effectiveness of activities and the appropriateness of guidance for the project were assessed by asking the subjects to give feedback after they completed six project-based lessons. The findings of this research can be summarized as follows. First, literary students liked to use hypermedia-based instruction. The organization and structure for the hypermedia-based instruction satisfied these fifth-grade literary students. Especially, there are many varied sources that arouse the students' interest. The instructors suggested that a proper level of guidance would facilitate the success of project-based learning (Mohammed, Habeeb, & Al-Muhja, 2022). On the other hand, if the problem-based learning implementation was too difficult, it would frustrate the students and they would lose their interest. Second, this instructional design provided many varied and rich sources of information, such as virtual field trips, Internet resources, virtual sites, film, CD-ROM electronic encyclopedias, and animations. The instructional design allowed students to collect, organize, interpret and transfer the processed information into a visual story of their own. thirdly: hypermedia gave fine tools — paintbrush and word — for students to get involved in the task wanted. The elements of imaginative thinking were presented by using different tools to illustrate the idea development procedure. To sum up the outcomes of this investigation point out that a hypermedia based project can potentially offer more diverse types of learning experiences— which would result from an impact on a student's use of creative imagination (Waheed et al., 2020). The eight sections are the introduction to the project-based study, literature review and rationale of the study, development and details of the hypermedia-based learning program, findings, conclusions and recommendations for the program plus guidelines for implementation in educational and learning settings. The first chapter presents the aim, research questions, study framework and importance. The second chapter contains the literature review and theoretical base. The third chapter explains about project design which consisted of six learning objectives with their respective learning activities and methods of assessment along with lesson organization (Radif, 2023). A hypermedia-based learning project for the story "Possibly Cheese Melt Water Horse" was employed to discover the effectiveness of the project-based learning program in arousing literary fifth graders' creative imagination. (Kayaalp et al., 2024)

Discussion

Combining creativity with a superior imagination was found to improve the creative performance of the students. Students who used the World-Wide Web to obtain large quantities of up-to-date information, and used chat rooms and email to conduct interviews, allowed an excellent assessment of the characters of their choice. These students also demonstrated superior narrative skills and created compelling attention-grabbing product-concluding presentations. The topic-specific hypermedia information greatly facilitated the success of these fifth-grade students as they explored the lives and themes within the assigned stories. (Alrashdi, 2023)

Our findings substantiate the utility of enhancing both creativity and imagination concurrently. A combination of creativity with imagination can increase the creative potential in these literary students. This supports earlier theoretical literature suggesting that enhancing both creativity and imagination, although a complex process, can better serve students in our schools. In addition to the significant advancements with respect to creativity and imagination, the combined use of the Internet and web-based instruction facilitated and reduced the time required for students to conduct research and complete reports. Our findings support prior educators who have emphasized that the interest and enthusiasm of students increase dramatically because the worldwide web is composed of engaging primary sources. (Renzulli et al.2022)

Conclusion and Implications for Practice

The manner in which students involved in HP2 chose to divide into subcommittees and assume leadership responsibilities was in total distinction to traditional classroom routines. Yet it was only a reflection of the nation's Founding Fathers, the very people whose thinking - changed and directed - provided the energy that produced emergent concepts for the final document that by the end of the project the teachers found the difference between the behavior of their students and our national leaders 'became quite blurred.' From these students one learns not only about the concept of imagination as a powerful cognitive skill but that imaginations can be developed and enhanced by designing instruction to enrich the learning environment by infusing telecommunication technologies. (Johnson et al.2022). One of the strongest implications for those practicing in school settings involves the power of fifth graders to work together and solve nearly human problems. The 65 students who collaborated with 'incredible excitement, passion, enthusiasm, and a sense of empowerment' spent inordinate amounts of time together in collaboration both face-to-face and in telecommunication. One teacher noted that 'some children don't step forward and assume leadership responsibilities, but in this project, the kids took charge. Another teacher was struck by the different learning styles represented by students. Whereas some were artistic, 'lots of the kids we most expected to succeed had not'; while 'quiet, often detached' students became highly competitive, some outgoing students were not successful. Yet the needs and contributions of all were recognized and respected by the students themselves. As the lead teacher for the project concluded, 'when given opportunities, the students do rise to the occasion.' (Singh et al., 2022) To enhance the internal validity of the experiment, the researcher took preliminary steps to ensure the equivalence of the experimental and control groups. By controlling certain variables that could positively or negatively influence the dependent variable, the potential impact on research outcomes was mitigated.

Equivalence of Research Groups

To enhance the internal validity of the experiment, the researcher, before implementing the experiment, took steps to ensure the equivalence of the experimental and control groups by controlling certain variables that could negatively or positively affect the dependent variable, which might influence the outcomes of the research.

Variable	Group	Number	Mean	Standard	Degrees	T-test	Statistical

				Deviation	of Freedom	T-test (Calculated)	T-test (Table)	Significance at Level (0.05)
Chronological Age	Experimental	22	204.32	7.82	40	0.40	2.02	Not Significant
	Control	20	203.40	6.96				
IQ Test	Experimental	22	25.68	11.73	40	0.243	2.02	Not Significant
	Control	20	24.80	11.71				
Prior Knowledge	Experimental	22	13	3.309	40	0.741	2.02	Not Significant
	Control	20	12.25	3.242				
Creative Imagination	Experimental	22	13.04	3.87	40	0.257	2.02	Not Significant
	Control	20	12.75	3.55				

Schedule 1: T-test Results for Equivalence of Research Groups

Research Instruments

The current study required the development of tools to measure creative imagination. The testing was implemented in two phases: a preliminary phase to ensure equality and equivalence between the experimental and control groups, and a subsequent phase to measure the impact of educational design using hypermedia technology, encompassing performance differentiation between the students of both groups.

Creative Imagination Tool

1. Theoretical and Methodological Foundations for Building the Test:

- The researcher reviewed various scales related to imagination and sought to utilize them in developing the creative imagination test, establishing the theoretical and methodological bases that form the fundamental pillars for the design and implementation of the research tool.

- A combination of the rational and experiential approaches was employed to define the concept of creative imagination. Input from expert reviewers was incorporated in several test construction procedures, thus enhancing the robustness of the theoretical and methodological foundations.

- Reliance on Vygotsky's (1931) theory of social learning was pivotal in defining the concept of creative imagination, its main areas, and behavioral components within the framework of cognitive-social theory.

- Scoring and Evaluation Mechanism: Each of the three components of the test evaluates three dimensions of creative imagination—fluency, flexibility, and originality. The total score obtained by participants through their responses to these components reflects the overall level of creative imagination, with the following steps implemented for evaluating fluency and flexibility, and determining originality:

- Fluency Assessment: One point is awarded for each unique and logical response, with fluency level determined by the number of unique ideas after excluding any fantastical, unreasonable, or repetitive ideas.

- Flexibility Assessment: One point is awarded for each idea that fits within a specific category (e.g., industry, agriculture, commerce, politics). Flexibility level is calculated based on the number of different categories that appear in the participant's responses to each item of the test, typically being less than the fluency level.

- Originality Assessment: An original idea is defined as one that occurs one to three times among student responses and is unique and unconventional, excluding familiar and traditional ideas even if they appear within the mentioned range. The researcher employed methods by Abd Noor (2005) to calculate the originality score for sample individuals:

- Three points are awarded for each idea repeated once among student responses.

- Two points are awarded for each idea repeated twice.

- One point is awarded for each idea repeated three times.

- Ideas repeated four times or more are not awarded any points.

- Total Creative Imagination Score: The total score for creative imagination for each participant is determined by summing the scores for fluency, flexibility, and originality, representing the participant’s capacity to generate diverse, flexible, and original ideas within the contexts provided in the test.

2. Initial Pilot Testing of the Tool:

- To verify the clarity of the test items and instructions, the researcher conducted a preliminary evaluation, which included analyzing the clarity of the test items and instructions, and determining the necessary time to complete the test. On Wednesday, December 20, 2023, the test was applied to a pilot sample of 30 female students from the fifth grade of liberal arts, under the supervision of the researcher. It was observed that the test instructions and items were clearly understood by the students, and the necessary duration for answering the test was set at 60 minutes, calculated based on the average time of responses from the first and last five participating students.

3. Second Pilot Testing of the Tool

- The test was administered to a randomly selected sample of 100 fifth-grade liberal arts An evaluation of the psychometric properties of the creative imagination test took place following correction of the answers by the researcher. The statistical analyses were aimed at investigating reliability, validity and ability to differentiate well between high and low performers..

Statistical Analysis of the Creative Imagination Test:

1. Discriminative Power of Test Items:

- The highest and lowest scores were used to represent the most extreme groups by selecting the top 27% and bottom 27% of responses. In assessing the quality of test items, a comparison was made between the mean scores of these two groups using T-test for independent samples at a significance level of 0.05— as an indication of discrimination in performance measurement. The results showed that the computed T-values exceeded significantly those tabulated, which means that we have successfully differentiated performance levels.

2. Item-Total Correlation:

- Pearson correlation coefficients were used for quantifying associations and relationships between the performance of an individual item and the total test score. The resulting correlations differed greatly in their values, which implies that each item managed to correlate reasonably well with the overall test performance; this is a sign of good internal consistency (reliability) and contributes construct validity to the test.

2. Domain-Specific Item Analysis:

- Pearson correlation was used to examine the connection between single item performance and its domain. This examination is instrumental in gauging the extent to which individual items contribute meaningfully towards measurement of the intended domain of creative imagination. The observed high correlation coefficients indicate that items are well-suited to their respective domains, and that they aptly capture what was intended in the constructs being measured

3. Reliability of the Creative Imagination Test:

- The assessment of the internal consistency of the test was done through the use of Cronbach's alpha, which is a widely used measure of scale reliability. The attained value of alpha was very high— this means that all test items are consistently measuring the same construct and hence the test can reliably evaluate creative imagination in various samples.

Pilot Testing Outcomes:

1. First Exploratory Application:

- The first phase demonstrated the ability of the initial application to give clear insights on how well the test instructions were put and time appropriateness for test completion. The feedback obtained from this stage was used in making slight modifications on the test instructions to guarantee their simplicity and suit optimization of the test duration in real research setups.

2. Second Exploratory Application:

- It was this stage that involved a larger sample size, which in turn enabled a more comprehensive study on the psychometric properties of the test. The information collected from this source was subject to various detailed statistical analyses that then led to more modifications being made on the test items and adjustments on how the test was structured as a whole— these were geared towards ensuring that the future utility of the test in research would be more valid and reliable.

Conclusion and Future Directions:

- The test of creative imagination that was produced through the current research has shown itself to be a reliable, valid instrument for gauging creative potential within educational settings. It has good psychometric properties and showed excellent reliability, validity and ability to effectively differentiate between various levels of creative performance.

- The author suggests that the evaluation of the appropriateness of these programs should be prioritized. The testing ground should include various cultural environments, to confirm once more the actual impact of this method, and under different social and cultural conditions. In addition, there are also reasons for which it is possible to carry out research over time on children who have been exposed during their education to various intervention types with regard to development of creative imagination as well as students' age.

The elaborate scrutiny, the in-depth analysis and the exhaustive experimentation confirm that the creative imagination test is more than ready for the wider use in educational research. It presents itself as a very useful instrument for those educators or researchers who are keen on both encouraging and estimating creativity among students.

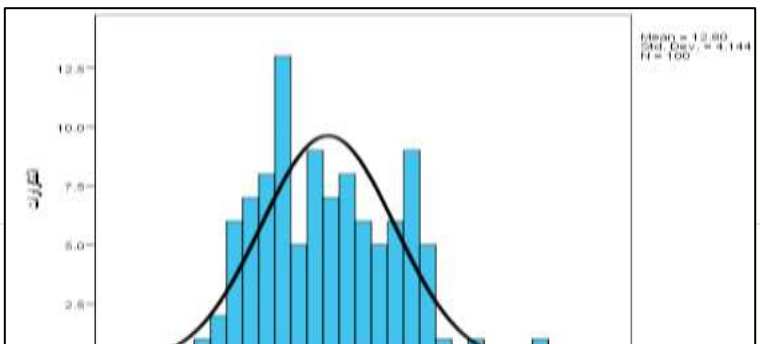

Figure 3 : Distribution of Scores in the Pilot Sample for

Data analysis provides a glance at the true nature of psychological measures. It is important as just theoretical analysis may not give full information on the appropriateness and the accuracy of these tools. This procedure reveals the basic properties of test items and enables a more precise evaluation. Those knowledgeable in psychometrics are in consensus about the need for ensuring that a test can discriminate between individuals with high and low performance on the trait being measured by looking at validity coefficients— these checks help instill confidence among researchers about the test's appropriateness, as well as its ability to measure the targeted psychological dimension in an accurate and reliable manner (Murphy, 1988).

Procedures for Verification:

1. Discriminative Power of Test Items:

- In order to find the two ends of the scale, that is those who responded very positively and those who responded very negatively, we selected the top 27% and bottom 27% of responses. The test items' ability to discriminate was assessed through an independent samples T-test with 98 degrees of freedom at a significance level of 0.05. Calculated T-values varied between 2.44 and 26.01— all greater than the critical T-value of 2.01— which demonstrates statistically significant differences in scores between high and low groups at all points along the scale and hence confirms good discriminative ability for the test on this basis.

2. Item-Total Score Relationship:

- The Pearson correlation coefficients were used to measure the relationship between items' individual performances and total test score. The values of correlation ranged from 0.39 to 0.80; all of them are higher than the critical value of 0.194 at 0.05 level. This means that each item is significantly related to the total test score, hence affirming the relevance of all items in the creativity test.

3. Item-Domain Score Relationship:

- To study the connection between the performance of single items and their domains within the test, Pearson correlation coefficients were used. The data indicated correlation coefficients that varied from 0.47 to 0.89 which showed statistical relationship at significance level of 0.05 with critical value of 0.194 having 98 degrees of freedom meaning item scores are related significantly to domain scores, as well as the work done by Jassim & Mohammed in 2022 demonstrates an alignment between items and the respective domains they represent for measurement purposes.

3. Domain-Total Score Relationship:

- The researchers performed an examination of the connection between the achievements on different domains with that on the general test employing Pearson's correlation coefficients. The findings displayed correlation coefficients ranging from 0.91 to 0.97, which are statistically significant at the 0.05 level — implying a high consistency between domain performance and overall test performance, thus strengthening the construct validity of the instrument.

Reliability of the Creative Imagination Test:

- The test is highly reliable and its validity has been well demonstrated, hence the Creative Imagination Test is all ready for wide usage in scientific research. These qualities make it possible to function as a consistent measure in any environment and situation with regards to the estimation of creative capabilities.

The Creative Imagination Test is ready for wider applications due to its high reliability plus validity which make it able to reliably measure creative capabilities in different settings and consistently identify such assessments.

Future Directions and Recommendations:

The recommendations and steps are listed here for the betterment of its efficiency and usefulness in applications for educational and psychological research due to the strong psychometric properties of the test.

1. Wider Implementation:

- The Creative Imagination Test is a good idea to be used in different educational levels and cultural environments. Such wider application would help establish its validity, reliability, and practicality — and give some clues on creative skills among various population groups.

2. Longitudinal Studies:

- Creative Imagination Test could also be applied in a longitudinal study to provide a data-driven feedback on the growth of creative abilities over time— particularly under different educational interventions. This type of information would greatly assist educational practitioners and decision-makers by allowing them to adopt more innovative and beneficial teaching practices that encourage creativity.

3. Integration with Educational Programs:

- The Creative Imagination Test could be implanted into the systems of assessment and learning enhancement of schools. Its integration would mean that creative skills are regularly watched, which would in turn help students develop in a more holistic way.

4. Cross-Disciplinary Research:

- Associations with investigators from fields other than its own could significantly contribute to our knowledge of how creativity works. The blending of different fields in this type of research can look into the neurologic bases for creativity and laterally probe the impact that different educational techniques have on these neurologic processes (Mohammed et al., 2022).

5. Tool Enhancement Based on Feedback:

- It is important that feedback should be continuously obtained from users who have applied the test in various circumstances. Such feedback will help to introduce step-by-step changes both in the questions and the methods of evaluation. This iterative process through feedback loop is aimed at ensuring sustainability of relevance of the test, and effective check on what it purports to measure with consistency for applicability across different contexts and time horizons.

6. Development of Complementary Tools:

- Expanding the scope of other tools in addition to the Creative Imagination Test could lead to an all-rounded evaluation of creativity. These tools might be able to measure some other similar but different constructs such as ability to solve problems, critical thinking or what is known as emotional creativity; these combined would give a more complete picture regarding an individual’s level of creative potential.

7. Educational Workshops and Seminars:

- The utility of the Creative Imagination Test in educational settings can be enhanced by organizing workshops and seminars for educators on how to effectively use and interpret it. Such trainings will be an avenue through which the nuances of creative assessment can be imparted to educators, thus empowering them to better support their students' creative development.

Conclusion:

The Creative Imagination Test: a significant creation to the fields of psychology and education, with a design that is validated and reliability that is established. By rigorously evaluating creative imagination, it paves the way not only for educational assessments but also for gaining insights into the very workings of creativity. Let us use and improve this tool more as it will support the perennial endeavor in developing creativity within worldwide educational systems— which in turn would redound to students by arming them with such competencies required for success amidst ever more intricate and ever changing environmental demands.

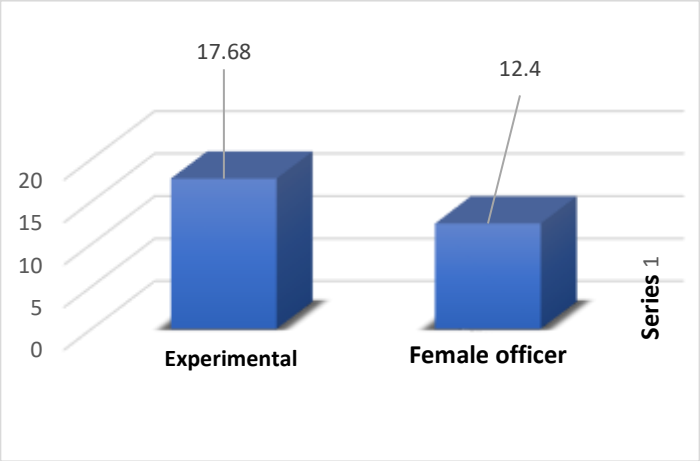

Figure4: Average Scores of the Experimental and Control Groups in the Creative Imagination Test

Group	Number	Mean	Standard Deviation	Degrees of Freedom	T-test		Statistical Significance at Level (0.05)
					T-test (Calculated)	T-test (Table)	
Experimental	22	17.68	3.591	40	3.976	2.02	Significant
Control	20	13.25	3.626				

The data from the table above illustrate the mean score for the experimental group in the

Creative Imagination Test, which stands at 17.68 with a standard deviation of 3.591. Conversely, the mean score for the control group is 13.25, with a standard deviation of 3.626. The calculated T-value is 3.976. When compared to the critical T-value of 2.02 at a confidence level of 0.05 and with 40

degrees of freedom, significant statistical differences are evident between the experimental and control groups, favoring the experimental group. Consequently, the null hypothesis is rejected, and the alternative hypothesis is accepted, stating:

"There is a statistically significant difference at the 0.05 level between the mean scores of the students in the experimental group, who studied philosophy and psychology in an educational design environment using hypermedia technology, and the mean scores of the students in the control group, who studied using conventional methods in creative imagination."

To quantify the effect size of the independent variable (educational design using hypermedia technology) on the dependent variable (creative imagination), the researcher used the eta squared (η^2) effect size measure. This statistical approach helps in determining the extent to which the independent variable influences the variability in the dependent variable, providing a measure of the impact strength of the educational intervention.

Magnitude of Impact	Effect Size (η^2)	Dependent Variable	Independent Variable
Very Large	0.283	Creative Imagination	Educational Design with Hypermedia

Schedule 3: Impact of the Independent Variable 'Educational Design with Hypermedia Technology' on Creative Imagination

From the data in the table above, we deduce that the effect size for the independent variable "Educational Design with Hypermedia Technology" on creative imagination is 2.83, which is a very large indicator according to the standards set by Cohen (1988) and referenced in Heiman (2011).

Results Related to Creative Imagination:

The result of creative imagination which has been revealed based on this study is that students in the experimental group who studied philosophy and psychology through hypermedia technology were found to be more successful compared to those students in the control group who used traditional methods in the test of creative imagination. The reason for this success can be explained by adopting Vygotsky (1931) and his theory on creative imagination which bases successful implementation of such programs.

Hypermedia allows for synchronous communication between the two hemispheres of the brain. The use of pictures, videos and illustrations activates the visual cortex which is in the right hemisphere thus enhancing creativity and imagination (Siebner et al., 2022:59).

In brain communication hypermedia can foster synchrony interaction between the left and right hemispheres. This is achieved through use of pictures, videos plus illustrations— which act as stimuli to the visual cortex, hence improving creativity and imagination capabilities (Siebner et al.,

2022:59). Increased Neuroplasticity: Hypermedia contributes to enhancing neuroplasticity, fostering the formation of new neural networks responsible for creative thinking through interactive learning and immediate feedback (Bărbuceanu, 2021:177).

Stimulation of the Reward System: Engaging and stimulating activities in hypermedia increase dopamine secretion in the brain, enhancing feelings of reward and motivation, thus aiding in the stimulation of creativity (Arnts et al., 2020:270).

Improved Executive Functions: Organized and sequential educational content provided through hypermedia technology activates the frontal lobe of the brain, responsible for planning, organizing, and decision-making, which helps improve the ability to imagine future scenarios and creative imagination (Barrett et al., 2020:2094). Reduced Stress and Improved Mood: Interactive and enjoyable learning environments offered by hypermedia reduce cortisol levels associated with stress, providing a less stressful educational setting that stimulates creativity and imagination (Wang & Zhang, 2020:169). These findings suggest that integrating hypermedia technology into educational design not only enhances the learning experience by making it more interactive and engaging but also significantly boosts students' creative capacities, aligning with modern educational goals to develop more innovative thinkers. Scientific Conclusions, Recommendations, and Future Research Proposals Derived from the Study:

Conclusions:

1. Improving Self-Education and Encouraging Creativity: Hypermedia technology has opened an avenue for the individual's self-directed learning to be easily obtained because it offers a continuous accessibility of educational resources at any time and place thus enabling such flexibility in learning that would help students acquire knowledge at their own pace which in turn suits their abilities resulting in improvements of academic as well as technical performance, and allowing for creativity to take place while developing imagination skills.

4. Hypertext Multimedia in Enhancing Creative Capacity: According to the aforesaid findings, we can say that hypertext multimedia technology in educational field is not just an advanced method of teaching but an effective tool for generating creativity which enhances the capabilities of students and makes the process of education more effective and exciting.

Hypermedia is a modern teaching method that stimulates creativity. Not just any modern teaching method, but based on those findings: it can be concluded that hypermedia technology use in educational settings serves as an effective tool for this purpose— which then contributes to the development of students' abilities and makes the educational process more effective and engaging.

4. Hypermedia as a Tool for Stimulating Creativity: From this information, we can infer that the adoption of hypermedia technology by educational systems isn't merely contemporary pedagogy but a facilitative tool for creativity stimulation. It fosters the enhancement of students' capabilities in addition to making the learning process more productive and interesting.

Research Recommendations:

1. Hypermedia Integration in Curriculum:

A call is made to extend the use of hypermedia technology throughout all subjects and all levels of education for the purpose of fostering self-learning and creativity which will help students keep abreast with technological development.

Teacher Training Program Development:

The development of quality training programs designed for teachers' skill enhancement in their applications of hypermedia technology use in teaching to deliver modern-technology-based quality education is highly essential.

3. Allocation of Resources to Improve Technical Infrastructure: Necessary resources should be provided to enhance the technical infrastructure in schools to ensure efficient and effective use of hypermedia technology, contributing to the achievement of modern educational goals.

4. Encouraging Research and Development in Interactive Education: Ongoing research should be conducted to assess the impact of hypermedia technology on other educational variables and to develop new educational strategies based on interactive technology, enhancing the effectiveness of the educational process.

Suggestions for Future Research:

1. Studying the Impact of Hypermedia on Other Study Subjects: Conduct research to explore the impact of hypermedia technology on the teaching of various academic subjects to determine the effectiveness of this technology in improving educational attainment in multiple fields.

2. Analyzing the Relationship Between Technology Use and the Development of Critical Thinking: Perform analytical studies to understand how the use of interactive educational technologies like hypermedia affects the development of students' critical thinking skills, and develop educational strategies that enhance these skills.

3. Evaluating the Effectiveness of Teacher Training Programs: Conduct research to evaluate the effectiveness of training programs provided to teachers in using hypermedia technologies, and identify areas that need improvement to ensure the delivery of high-quality education.

4. Survey Studies: It is advisable to conduct survey studies aimed at measuring the level of creative imagination among students and analyzing effective methods for developing it, contributing to the improvement of educational programs and enhancing creativity among students.

5. Analyzing Study Materials: Propose descriptive studies aimed at analyzing the content of different study materials and their compatibility with developing creative imagination, thus improving curricula and ensuring educational objectives are met.

Scientific conclusion:

1. Existing Knowledge on Hypermedia in Education: While there is substantial existing literature on the use of hypermedia as an educational tool, most studies focus on its application for improving factual knowledge and cognitive skills rather than specifically enhancing creative imagination in literary contexts. This research aims to bridge that gap by examining how hypermedia can specifically foster creativity among young literary students, which is less explored.

2. Integration of Creative Imagination with Hypermedia Tools: There is limited research on the direct correlation between hypermedia tools and the enhancement of creative imagination. The study seeks to investigate whether and how hypermedia can be designed to specifically enhance the creative capacities of students, beyond the general usage of these technologies for educational purposes.

3. Effectiveness of Hypermedia on Different Learning Styles: The research could explore how hypermedia caters to different learning styles in the context of creative imagination. It seeks to address the gap in understanding whether hypermedia-based instructional design can equally benefit all students regardless of their inherent learning preferences, which is often not the focus in existing studies.

4. Long-Term Impact of Hypermedia on Creative Skills: There is a scarcity of longitudinal data on the impact of hypermedia usage on the sustained development of creative skills over time. This

study could provide insights into the long-term benefits or drawbacks of using hypermedia in educational settings to nurture creative skills.

5. Comparative Analysis with Traditional Learning Methods: Many studies emphasize the use of hypermedia but lack a robust comparative analysis with traditional learning methods, specifically in the context of creative imagination. This research could fill this gap by providing a detailed comparison to evaluate the effectiveness of hypermedia versus conventional instructional methods in fostering creativity in literature education.

By addressing these gaps, the research aims to contribute significant insights into the design and application of hypermedia technologies in educational settings, specifically tailored to enhance creative imagination among literary students.

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